STRENGTHENING AGRICULTURAL SUPPORT SERVICES FOR SMALL FARMERS

Report of the APO Seminar on Strengthening Agricultural Support Services for Small Farmers held in Japan, 4-11 July 2001 (SEM-28-01)

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CONTENTS

Part I Summary of Findings 1

Part II Resource Papers

1. Present Situation and Challenges of Agricultural Support Services in Asia and the Pacific…… *Rita Sharma* . . . 12
2. Measures for Enhancing Efficiency in the Delivery of Agricultural Support Services in Japan: Agricultural Credit…… *Katsumasa Ishige* . . . 30
3. Cooperatives and the Development of Farming Guidance Activities …… *Kenki Maeda* . . . 33
4. Measures for Enhancing Efficiency in the Delivery of Agricultural Support Services in Japan: Research and Extension…… *Mitsuaki Sanada* . . . 30

Part III Country Papers

1. Bangladesh…… *Mohammad Serazul Huq Chowdhury* . . . 51
2. Republic of China…… *Jep-pin Chen* . . . 60
3. Fiji…… *Mere Kini Salusalu* . . . 69
4. India (1)…… *Govind Prasad Gupta* . . . 81
5. India (2)…… *Shalini Rajneesh* . . . 89
6. Indonesia…… *Johanes Wibowo* . . 109
7. Islamic Republic of Iran…… *Samad Rahimi-Soureh* . . 117
8. Republic of Korea…… *Kwon Woong* . . 128
9. Malaysia…… *Mariatul Af-ida bt Mohd Tajul Ariffin* . . 137
10. Mongolia…… *Bazaryn Bayarmaa* . . 144
11. Nepal…… *Satya N. Tiwary* . . 157
12. Pakistan…… *Sardar Khan* . . 167
13. Philippines…… *Arsenia A. Perez* . . 174
14. Sri Lanka…… *H. M. Herath* . . 181
15. Thailand…… *Anan Lila* . . 192
16. Bhutan…… *Karma G. Wangchuk* . . 203
17. Cambodia*…… *Siv Touch* . . 210
18. Maldives…… *Aminath Shafia* . . 221
19. Papua New Guinea…… *Ian Mopafi* . . 227

Part IV Appendices

1. List of Participants, Resource Speakers, and Secretariat 240
2. Program of Activities 244

* Cambodia joined the APO in 2004.

SUMMARY OF FINDINGS

INTRODUCTION

The Seminar on Strengthening Agricultural Support Services for Small Farmers which was organized by the Asian Productivity Organization (APO) and hosted by the Government of Japan was held in Tokyo from 4 to 11 July 2001. The Association for International Cooperation of Agriculture and Forestry (AICAF) implemented the program in cooperation with the Ministry of Agriculture, Forestry and Fisheries (MAFF). Fifteen participants from 14 member countries, four participants from four non-member countries and four resources speakers from the Ministry of Agriculture, India; the Ministry of Agriculture, Forestry and Fisheries, Japan; and the Central Union of Agricultural Cooperatives (JA-Zenchu), Japan attended the Seminar. The objectives of the Seminar were to: 1) review the current status of agricultural support services in member countries; and 2) suggest measures for further improving the efficiency and effectiveness of such services.

The Seminar consisted of the presentation and discussion of resource papers and country papers, as well as field visits to Tatebayashi-shi, Gumma prefecture. The topics covered by the resource papers were: 1) Present Situation and Challenges of Agricultural Support Services in Asia and Pacific; 2) Measures for Enhancing Efficiency in the Delivery of Agricultural Support Services in Japan: Agricultural Credit; 3) Cooperatives and the Development of Farming Guidance Activities; and 4) Measures for Enhancing Efficiency in the Delivery of Agricultural Support Services in Japan: Research and Extension. The country papers, on the other hand, focused on the present situation of agricultural support services including issues/problems affecting the delivery of such services and roles played by NGOs and the private sector and on how to improve the delivery of agricultural support services in the respective countries.

The highlights of the Seminar are presented below.

HIGHLIGHTS OF RESOURCE PAPERS

Present Situation and Challenges of Agricultural Support Services in Asia and Pacific

The Asia-Pacific region accounts for nearly half the world's population. India and China together are home to 70 percent of the region's population. Majority of the Asian people depend upon land and agriculture for their livelihood. Increasing demographic pressure has led to declining per capita availability of land. The number of small and marginal farmers is on the rise. Growing biotic pressure on the natural resource base is leading to degradation of land resources, depletion of water aquifers and vanishing biodiversity.

Agriculture continues to be the engine of economic growth in most developing countries of the region. In India, it still accounts for nearly one-third of the GDP and provides livelihood to two-thirds of the population. Indian agriculture is characterized by a preponderance of small and marginal landholdings. More than 70 percent of India's farmers own less than 2 ha of land. From the mid-1960s onwards, as a result of the Green Revolution the agriculture sector in India registered spectacular growth transforming the scenario of food deficiency into one of self-sufficiency. In addition to food grains, oilseeds, fruits, vegetables, sugarcane, milk, fisheries and poultry recorded impressive gains.

The success of the Green Revolution was experienced in several Asian countries where the rapid adoption of modern agricultural technology resulted in dramatic gains in productivity. However, despite significant achievements in food production, problems of food and nutrition security, poverty alleviation and regional imbalances still persist. Moreover, the second generation effects of the intensive application of the seed-fertilizer-irrigation technology began to manifest themselves in rising soil salinity and toxicity, water pollution and nutrient imbalances, almost negating the beneficial effects of the technology. It is noteworthy that agricultural growth which accrued as a result of the Green Revolution was restricted largely to the irrigated, well-endowed regions. A major portion of cropland continues to be dependent on rains. In irrigated areas, small farms have been able to achieve some measure of economic viability. In rainfed areas, however, they have remained bereft of the benefits of modern agricultural technology. Productivity levels in rainfed regions are less than half those in irrigated lands.

Small farmers in India as well as in many other countries of the Asia-Pacific region have several common features in being (1) seasonal producers, (2) fragmented buyers and suppliers unable to exploit economies of scale and (3) dominated by household economics where functions such as consumption, investment, work and social activities are undifferentiated and unspecialized. In contrast, buyers and service providers who operate in the market tend to be large-scale operators, commercially-driven, and able to exploit economies of scale. Small farmers, especially in the rainfed areas, are faced with constraints in the production process, in access to inputs and credit, marketing and value addition. Their production level is limited by the small size of their holdings, weaknesses in the land tenure system and unequal access to irrigation water. They often encounter difficulty in procurement and application of modern technologies because of the high cost and greater risk involved.

In many countries governments have been playing a critical role in influencing both the production process by providing subsidized inputs, and marketing through procurement at minimum support prices. However, this places considerable financial burden on the exchequer which most can ill afford as it reduces their capacity for investment in capital assets and development infrastructure. With the winds of liberalization blowing and removal of trade barriers under the new World Trade Order there is a major shift from production-driven agriculture to a market-driven one. While on the one hand the WTO regime is opening up new opportunities for the farming community in the world market place, the large majority of small and marginal farmers, who are not yet organized enough to take advantage of the world markets perceive the new order as a threat to their livelihood. Lack of resources, inadequate market access, poor knowledge of postharvest processing and value addition and weak infrastructure tend to put small farmers at a disadvantage in a competitive global market. This is further compounded by low levels of education and lack of group organization which weakens their bargaining capacity. To enable small farmers to reap the fruits of liberalization and globalization governments must play a proactive role in empowering them to take advantage of the opening up of market opportunities.

Government-provided agricultural support services need to be reformed to enable small farmers to take up commercial farming through sustainable practices. Empowerment of farmers implies undertaking land reforms, ensuring equitable access to irrigation water and its efficient management and promotion of watershed development with community participation in dryland rainfed areas. Extension services will need to be radically restructured to make technology dissemination responsive to small farmers. Innovative institutional arrangements would need to be evolved to make the extension system farmer-driven and farmer-accountable. Credit and thrift societies operating at farm level offer an effective mechanism of credit delivery to small farmer with low transaction costs. Private service providers will need to be encouraged by creating an enabling environment and a level playing field.

Agricultural marketing will become the foremost challenge in the new dispensation. Several measures for marketing of agricultural produce are being promoted both by the government as well as on private and cooperative initiatives with varying degrees of success. Regulated agricultural produce marketing yards, producer-consumer markets and village weekly markets have provided reasonable outlets for farm produce. Cooperative marketing societies/farmers' associations are also demonstrating the success of group farming. There is need for more linkages between farmer-producers and corporate/cooperative processors in contract farming arrangements. These arrangements will, however, need to be fair and competitive.

Experience shows that the strength of small farmers lies in group mobilization for meeting diverse agricultural needs including land leasing, accessing inputs, pooling resources, sharing information, agro-processing/marketing of produce and above all credit and thrift groups for consumption and production loans. Considerable success with respect to access to technology, skill upgradation and marketing with Self-Help Groups (SHGs) and Farmer Interest Groups (FIGs) has been demonstrated under the National Agricultural Technology Project in India. Village level groups are now beginning to federate upwards into block and district level unions for wielding greater influence on the agricultural research and extension agendas as well as for bulk marketing.

In the new economic regime where market forces will play a major role, the private sector will increasingly provide a variety of agro-services. The responsibility of the government for effective enforcement of legislation which ensures quality control of inputs such as seeds, pesticides, fertilizers, etc. will increase. The government's role as arbitrator of conflicts between various private sector service providers will increase and systems to address grievances will need to be developed. However, in the emerging pluralistic scenario the role of public agencies would need to be redefined from being solely providers of services to graduate to an appropriate mix of provider, coordinator, facilitator, enabler and regulator. The

large section of small and marginal farmers and landless laborers as well as remote and backward regions would continue to need the services of the public service providers, as they are not likely to be serviced by a competitive private sector in the near future. Public functionaries' role would increase in arbitration of conflicts, assuring accountability of all private service providers to the farmers and ensuring transparency through provision of information. The overall environment of private provision of agro-services deserves to be encouraged through policy reform and institutional changes so that farmers needs are serviced more efficiently.

In the initial phases of the new liberalized and globalized regime, as the farming community is unwrapped from its cocoon of protectionist blankets, the small and marginal farmers are likely to be the most adversely affected. The reform and restructuring process being undertaken in many countries to usher in a more market-oriented economy must necessarily have built-in safety nets and safeguards to protect the weakest and most vulnerable groups of the farming community from losing their livelihoods and falling further below the poverty line. Bringing in reforms with a "human face" will help ease the transition.

Measures for Enhancing Efficiency in the Delivery of Agricultural Support Services in Japan: Agricultural Credit

Along with the process of globalization, Japanese agriculture now faces several critical problems, namely: 1) a decline in the food self-sufficiency ratio (i.e., down to only 41 percent in 1997); 2) a decrease in the number of farm households and arable lands; 3) aging of majority of farmers; and 4) a decrease in the number of new farmers. To cope with these issues the country is expecting that agricultural credit would play an increasingly important role.

The main stay of the national agricultural credit policy is the institutional credit system. This system includes many types of loans funded by the national budget and interest-subsidized loans extended by agricultural cooperatives to farmers. The major categories of loans are those financed by the Agriculture, Forestry and Fishery Finance Corporation Funds, the Agricultural Modernization Funds and the Agricultural Improvement Funds. In general, the institutional credit system intends to reduce the level of interest rate charged to farmers as compared to a usual commercial loan. Within the basic framework of agricultural policies, the shift "from grants to loans" is being promoted. Accordingly, the institutional credit system has been a dominant factor in the agricultural policy area, especially, in terms of helping and enhancing the activities of individual farmers, groups of farmers and small-scale enterprises engaged in agriculture.

Institutional credit, firstly, has helped farmers in many ways enabling them to invest funds for improvement of their farming operations (e.g., in farm machinery). Secondly, it has assisted farmers in the construction and maintenance of rural infrastructure such as hospitals and clinics, training facilities and sewerage systems. And thirdly, it has contributed to the building of food processing facilities for products like dairy and jams. In particular, these projects have created new employment opportunities in rural areas and have prevented younger people from migrating to urban cities.

At the same time, however, several important issues and problems have been pointed out regarding the institutional agricultural credit system. Based on past performance, loans specially focused on active farmers with excellent entrepreneurship spirit were found to be insufficient. As a result, the number of part-time farmers increased and enlargement of farmland per farmer might not have been well achieved. Also, many farmers now faced heavy debt problems basically caused by their overinvestments in the past. To a certain extent, this was caused by their lack of attention on the improvement of their farm management. The decrease of prices of farm products like rice and meat also contributed to this situation in recent years.

For the future improvement of the performance of institutional credit, several important points were indicated. First of all, it was stressed that loans of prospective farmers and farmers' groups were necessary in order for them to buy or use much more farmlands. In this regard, the government introduced the "Super Integrated Loan Scheme" in 1994 which was mainly for supporting the designated farmers and their groups. Secondly, it was strongly desired that the new type farmers who have enough knowledge and technologies on how to manage their farms as enterprises were assisted. Thirdly, regarding the loan procedures, there were too many schemes and programs at present. These need to be simplified as much as possible from the viewpoint of users. Fourthly, regarding issue of insufficient collateral, due to the recent decrease of farmland prices, the Agricultural Credit Guarantee Insurance System needs to be strengthened further. Lastly, the strengthening of the agricultural cooperative (JA) itself was very important, so that a plan for merging weak and small JAs was now being implemented. In the future the number of JAs were expected to decrease to around 500 all over Japan.

Cooperatives and the Development of Farming Guidance Activities

The evolution of the agricultural cooperative system in Japan has been characterized by four distinct periods. The first period is marked by the creation of the agricultural cooperative in the country. The second period features the introduction of the "agricultural park" concept while the third period highlights the promotion of a regional agriculture promotion plan. The fourth period encompasses the present.

The food shortage and unemployment of agricultural engineers after the Second World War prompted the agricultural cooperative to undertake a farming guidance program at the initial stage. Later when its management began to falter a reorganization of the cooperative was pursued involving the diversification of the technical agricultural guidance being provided to the farmers and the transfer of the cooperative engineers to regional agricultural improvement and extension centers and related guidance organizations. In the late 1950s when agricultural productivity declined an agricultural cooperative structural improvement plan was introduced. The plan called for the establishment of farm improvement goals and the formulation and promotion of a regional farming guidance improvement plan which entailed shifting the focus from individual farmers to groups of farmers in a region. The shift reflected the limitations of providing farm guidance on an individual farmer basis, the expansion of agricultural land for mass production and the necessity of promoting the development of crop-based agricultural organizations. Such an environment ushered in the "agricultural park" concept in the second period.

The concept became the pillar of the agricultural cooperative's farming guidance project. Having the farmers work collectively and creating a consistent system of production, distribution and shipping for each crop resulted in the formation of major production farms and simplification of the distribution process and eventually to improved management of the agricultural cooperative and increased farmers' incomes. The stable growth achieved after the oil shock of 1973, however, led to relative abundance and stagnant prices of agricultural products. As a result some agricultural parks gradually lost power.

To address this development, the agricultural cooperative strengthened its supply management system focusing on the major products. Thus, during this third period agricultural land use planning was introduced as a measure for enhancing the regional agriculture promotion plan. The latter involved the formation of regional farming groups which promoted the efficient use of agricultural production resources, mainly land.

At present, the significant decline of the country's food self-sufficiency rate in calorie terms from 70 to 40 percent, the decline in the number of farming households from 6 to about 3 million and the decrease in agriculture's share in GDP from 9 to less than 1 percent have all compelled the government to revise its basic food law. The new Agriculture Basic Law which was enacted in 1999 places priority on the improvement of the food self-sufficiency situation of country and on the fostering of farmers.

Since the 1950s the agricultural cooperative in Japan, or JA for short, has carried out marketing activities based on the three joint marketing principles of unconditional commission, average sales and joint calculation. The system involves the producer consigning his product for sale to the JA unconditionally and the JA in turn selling the product to the market basically all at once and returning the proceeds of the sale uniformly to the producer. This entails two problems, however, one concerning JA being responsible for the sales activity and the other involving the relationship between the members of the cooperative and the JA itself.

Because the JA looked to the wholesale market as its customer, it tended to ignore the needs of consumers and other concerns that did not pass through the market. As a result the JA failed to make an effort of understanding the needs and concerns of those who consumed the products of its members. As regards the second problem, the joint marketing system might be depriving the members of the JA of the "joy of farming". While such system protected farmers' incomes and strengthened the power of the JA in the market it prevented individual members to undertake their own marketing activities which could provide them a feeling of self-satisfaction in seeing that their efforts had met the needs of consumers.

To address these problems, the "local products, local consumers" scheme was promoted as an example of good marketing. For the consumers, the scheme meant consuming locally produced products, and for producers, it meant having local people consume their products. The advantages of the scheme included the following: 1) producers were able to market their products in fresher condition as the spatial distance between producers and consumers was shorter; 2) agricultural products were sold at a lower price which consumers desired because of the lower transportation cost and the absence of mediation cost; 3) consumers were able to feel closer to producers; 4) producers were able to assess the needs of consumers more easily; 5) consumers could tell producers what it is they wanted; 6) information was more readily transmitted from producers to consumers; and 7) producers were made aware that local consumers could become their long-lasting customers.

With the "local products, local consumers" scheme the number of people engaging in agricultural production would in all likelihood increase and all kinds of communication channels would open up within a region.

Measures for Enhancing Efficiency in the Delivery of Agricultural Support Services in Japan: Research and Extension

Because of the limited farmland available and small size of farm holdings in Japan, skills improvement plays a very significant role. And in the context of the increasing globalization of the world economy, improving business management skills has been made even more indispensable to the strengthening of the competitiveness of the domestic agriculture of the country. Other factors such as the aging of the farm population and the decreasing number of farmers have also contributed to the importance of the agricultural extension service.

The operation of Japan's agricultural extension service is based on the Agricultural Improvement Promotion Law. The Law stipulates that extension service be provided as a cooperative endeavor between the national and prefectural governments. Extension is basically aimed at affecting a smoother transfer of agricultural technology to farmers, as well as improving the general welfare of the farming population.

Based on the Law, the following guidelines have been formulated: 1) implementation of projects is undertaken according to the fundamental policy decided between the national and prefectural governments; and 2) arrangement is to be made for the establishment of an agricultural improvement and extension center in every prefecture made up of extension staff (extension workers and subject matter specialists) holding prescribed qualifications.

The cooperative extension service enables subject matter specialists to address requests of farmers for technical innovation to research and experiment stations. The extension workers on the other hand plan their work based on technologies developed in the research and experiment institutes. An extension information network facilitates the dissemination of information concerning business management methods and agricultural technologies to farmers. Extension methods include demonstrations, holding of local exhibitions and establishing of direct contact/relation with farmers in the area. In addition to taking care of the production concerns of farmers, extension workers are also responsible for improving the daily living conditions of farmers.

Extension workers are recruited among individuals with an undergraduate degree who have passed the qualification examination given by the prefectures. After they are selected they receive training and measures are taken to improve their general instructing abilities. The extension and instruction activities of the extension workers are carried out by dispatching one extension worker for each specialty field in every extension center within a designated area. In the case of subject matter specialists, they are recruited from among individuals such as researchers and extension workers who have passed the technical expertise qualification examination. Their activities include: 1) establishing the basic policy of extension and instruction activities within a prefecture; 2) instructing extension workers; 3) undertaking investigative studies about issues related to rural village activities and problems related to technology and management; and 4) promoting cooperation with other institutions such as research and experiment institutes.

A key pillar in the structure of the agricultural extension service in Japan is the farmers' academy. The academy serves as the farmers training and educational institution which has been established by the national and prefectural governments. As of April 2001 there were 41 prefectural farmer academies and one national farmers' academy. The target groups of these academies are farmers or individuals who will become responsible for the farming business and individuals who are candidates to become newly established farmers, whether they belong to a farming family or not. A farmers' academy has basically three departments. The first is the Training Department which implements long-term courses (two years) and requires at least a high school education. The second is the Survey Department which conducts a more advanced agricultural training and education and requires the students to have graduated from the Training Department or from a junior college. The third is the Study Department which implements short term courses (one year) and targets farmers and other interested individuals.

HIGHLIGHTS OF COUNTRY PAPERS

Agriculture remains an important sector in the economies of Asia and the Pacific region. Its contribution to GDP has actually declined significantly in recent decades in a number of countries,

particularly in East and Southeast Asia. However, it remains a principal source of employment for the rural population and a major earner of foreign exchange for the economy. Recently, as well the sector has been at the center of many policy discussions as a result of the growing concern of the world community for food security, sustainable development and the globalization phenomenon.

Agricultural production in many of the participating countries is generally characterized by the predominance of small farmers whose landholdings are often fragmented and average less than one hectare in size, and who often fall below the poverty line and therefore have very little resources to sustain their farming operation without external assistance. Such assistance has been essentially provided in the form of support services, mainly by the government and to varying extent by private sector and NGOs. On the government side, support services such as farm inputs, research and extension, credit and marketing are mainly provided by various agencies under the agriculture ministry. These services are extended either as part of the regular function of an agency like the extension department or as components of special programs that address particular areas or concerns such as poverty alleviation or integrated rural development programs. Because of the many entities/agencies involved in agricultural/rural development, however, inter-agency coordination needs to be continually strengthened. On the private sector side, the support services are mainly provided by NGOs as part of their community development activities. In recent years, there have been an increasing number of GO-NGO partnerships which have resulted in more effective delivery of support services to small farmers.

The predominance of small farmers in Asian agriculture and the scattered location of farms coupled with the limited infrastructure in many of the countries have served as major constraints in the provision of support services. To overcome these, land reform measures such as land consolidation have been undertaken to improve the delivery of these services. The grouping or organization of farmers who have similar circumstances and interests into small groups have also been pursued.

This latter strategy has been particularly helpful in the delivery of credit to small farmers. By forming into small groups the usual complex procedures involved in applying for a loan is avoided and the collateral required by the financial institution is substituted by the group guaranty. These two constraints, namely, complex loan procedures and requirement of a tangible asset as collateral, usually the farmer's landholding, have contributed much to restricting the access of small farmers to credit. Another key concern in lending programs to small farmers has been the interest rate. Farmers would usually pay an interest that is lower than that charged for a regular commercial loan. The interest rate subsidy has been criticized by some as being market distorting and working against the long-term viability of financial institutions. In this regard, various measures have been undertaken to reduce the transaction costs of credit such as group lending/Grameen type lending schemes.

Apart from the geographic/physical factors many of the countries have also to contend with the limited resources of government. Thus, basic infrastructure such as roads and communication facilities are lacking or inadequate in many areas where production activities take place. This has limited the impact of the services provided by the government. In extension, for instance, it has restricted the area covered by extension workers who themselves are limited in number. To partly address this issue, mass media such as radio and television have been employed by many of the participating countries in order to be able to reach more farmers. And with the advent of information technology, IT applications have also been increasingly employed in some of the countries (e.g., through the establishment of information kiosks in local areas/villages and the setting up of *e*-commerce sites on the Internet). There is also an increasing use of demonstration and farmer-to-farmer visit/exchange to enhance the impact of extension.

Investment in agricultural research has also been lacking in most of the countries. In addition, research programs may not be too relevant due to the lack of involvement and participation of the farmers and other stakeholders. Also, the weak link between research and extension still remains. All these have served to limit the contribution of research to raising the productivity of small farmers. There is, therefore, a need for research to be more participatory, demand or client-driven and farming system rather than commodity focused.

Support services for marketing have, in general, been inadequate in most of the countries. More market facilities need to be constructed and market information systems have to be strengthened so that small farmers are provided ready access to price and other market information. Marketing extension also needs to be improved, particularly, in the areas of processing and postharvest management.

In East Asia where agriculture has suffered from drastic decline in farming population and severe competition due to trade liberalization, alternative sources of income play a critical role. Various measures are being implemented in this regard, one of which is the promotion of leisure agriculture where farms have been converted into places for enjoyment and education of the public.

The agricultural support system in general needs to be reoriented toward community level/participatory type of planning and implementation. Evidences have suggested that the adoption of a participatory approach has generally resulted in more effective programs. Such a reorientation, however, needs to be carefully carried out. To be sure, the empowerment of local communities and farmers' groups to enable them to actively participate in decision-making would require undertaking a lot of capacity building and skills development measures, as well as ensuring the political commitment of local leaders. It would also entail promoting transparency and accountability. On the issue of limited government resources, some countries have taken measures to reduce the cost of providing support services by privatizing certain services or by charging farmers the cost of a service or some materials. This saves money for the government and it also weans farmers from overdependency on the government. Finally, the role of government needs to change. A more market-oriented environment requires that the government nowadays should serve mainly as a facilitator of development and enforcer of laws.

WORKSHOP OUTPUT

A workshop was conducted to provide an opportunity for further discussion and sharing of views and experiences among the participants. Specifically, two discussion points were taken up, namely:

1) what do you think are the major issues/problems directly affecting the delivery of agricultural support services to small farmers in Asia and the Pacific region, particularly, in light of the changing environment resulting from the increasing globalization trend and mounting concern for food security and sustainable development?
2) what strategies/measures could you suggest to effectively address these issues/problems, especially considering that government resources allocated to agriculture would most likely be less or not be increasing in the coming years?

To facilitate the discussions the participants were divided into two small groups. The outputs of the two groups were presented in a plenary session and these have been summarized as follows:

Group I (Bangladesh, Fiji, India, Islamic Republic of Iran, Republic of Maldives, Nepal, Pakistan, Papua New Guinea and Sri Lanka)
Chairperson: Mr. H. M. Herath (Sri Lanka)

	Major Issues/Problems	Suggested Strategies/Measures
Agricultural Support Services (total system)	* Lack of commitment to solve problems of small farmers * Unsustainable resource management * Unorganized small farmers * Lack of coordination among multiple agencies	* Formulate and implement policies that are time bound and transparent with provision for accountability * Develop appropriate agricultural technologies and practices * Promote the development of farmers' associations/cooperatives based on database of individual farmers * Decentralize agricultural development programs and activities
Farm Inputs (e.g., land, water, fertilizer, labor, etc.)	* Small, fragmented, scattered landholdings	* Strengthen implementation of land reform programs (land consolidation, homogenous cluster/group approach)

... To be continued

Continuation

	Major Issues/Problems	Suggested Strategies/Measures
Farm Inputs (e.g., land, water, fertilizer, labor, etc.)	* Inefficient water management	* Adopt watershed approach (rainfed areas) and organize/strengthen water users' associations (irrigated areas) * Move towards a realistic cost recovery approach
	* Inaccessibility to water	* Construct more irrigation facilities in the long term
	* Untimely availability and inadequate quality/quantity of fertilizer and agrochemicals	* Short term: make inputs available through cooperatives/groups * Long term: build infrastructure and deregulate input supplies * Adopt appropriate mechanization
	* Unskilled/exploited/shortage of labor	* Enforce minimum wage act * Undertake skills development
Research and Extension	* Irrelevant and top-down research	* Conduct problem-oriented adaptive/ applicable research * Adopt bottom-up approach/make farmers accountable
	* Improper allocation of funds * Limited coverage/gap between research and extension/inefficient extension by government	* Promote public-private partner-ships * Encourage farmer-to-farmer type extension
Financing/Credit	* Shortage/unavailability of credit/ high interest	* Earmark proportionate funds for small farmers by banks and other financial institutions * Subsidize/differentiate interest rates of loans for small farmers
	* Complex procedures for obtaining credit from banks and other financial institutions	* Adopt group lending through credit and thrift groups
	* Improper utilization of loan proceeds by farmers	* Monitor and supervise credit schemes by farmers' associations/groups * Streamline operations of credit institutions * Deregulate banking system
	* Absence/inadequacy/inefficiency of insurance schemes	* Provide subsidy in the form of insurance for small farmers' groups (premium to be made affordable)

Group II (Bhutan, Cambodia, Rep. of China, Indonesia, Republic of Korea, Malaysia, Mongolia, Philippines and Thailand)

Chairperson: Dr. Jep-pin Chen (Rep. of China)

	Major Issues/Problems	Suggested Strategies/Measures
Agricultural Support Services (total system)	* Top-down planning and management	* Adopt bottom-up approach which promotes active participation of all stakeholders
	* Strong dole out mentality (spoon-feeding) of the farmers	* Promote farmer-to-farmer visits/ exchange of ideas and experiences * Develop strong presence of private organizations

... To be continued

Continuation

	Major Issues/Problems	Suggested Strategies/Measures
Agricultural Support Services (total system)		C Change government's role into a facilitator and enabler rather than main doer/actor
Farm Inputs (e.g., land, water, fertilizer, labor, etc.)	C Smallholdings of farmers resulting in low productivity C Scattered location/remote location of landholdings C Soil problems (salinity, toxicity, erosion, nutrient depletion) C Poor water management (inefficient use of water, tail-end farmer gets less water, excessive irrigation fees) C High cost/unavailability of inputs C Labor/manpower (seasonal unavailability of labor, unskilled) laborers)	C Promote clustering, land consolidation and cooperatives C Strengthen research and development (R&D) C Enact appropriate legislation C Educate the farmers C Establish/construct more infrastructure facilities C Train extra workers/farmers C Organize/establish water users' associations for farmer empowerment C Strengthen R&D and extension C Adopt price stabilization measures C Develop labor markets (domestic/ outside) C Adopt mechanization strategy C Undertake relevant training
Research and Extension	C Weak linkage between extension worker and researcher (communication gap) C Lack of funds devoted to research	C Encourage self-financing/cost sharing between government and farmers for research projects C Conduct constant dialogue between researcher and extension worker C Empower farmers to do simple research C Encourage private sector to do research and share the results with farmers C Adopt a general policy of allocating 1 percent of GDP for research
Financing/Credit	C Lengthy and complex loan procedure C Lack of collateral C Lack of funds available for credit C Diversion of loan proceeds to other uses by farmers C High interest rate	C Promote group lending involving SHGs C Accept other forms of assets aside from land as collateral C Undertake value reorientation regarding credit C Subsidize part of the interest rate
Marketing	C Neglect of grading and packaging C Lack of market information C Lack of wholesale/auction markets C Lack of transportation and distribution facilities/centers	C Set standards for quality/packaging C Establish/strengthen Market Information System (MIS) C Promote joint-venture approach among government and private entities C Establish the facilities with government support and cooperation (e.g., through a loan at cost scheme) C Give government incentives to private sector for investing in storage facilities

FIELD STUDIES

For their field studies, the participants visited the following two places: 1) JA Tatebayashi-shi; and 2) the Tatebayashi Agricultural Improvement Extension Center. The highlights of these visits are presented below:

JA Tatebayashi-shi

The President of the Cooperative who gave a welcome remark received the participants. Afterward several JA senior staff provided a briefing about the business activities of the Cooperative.

JA Tatebayashi-shi is located in the southeastern part of Gumma prefecture. It is an area blessed with abundant natural resources with much of it being flat land serviced by two rivers and with generally fine weather throughout the year. JA Tatebayashi-shi has more than 7,000 members, 10 percent of whom are full-time farmers. Major crops grown in the area include rice, barley, wheat, vegetables and livestock products.

In 1999 the Cooperative registered total sales revenue of ¥10 billion, of which ¥7.5 billion was accounted for by sale of vegetables. Of the latter amount, about ¥3.5 billion came from the marketing of cucumber. Cucumber as well as other vegetables are mostly grown in greenhouses. Almost all of the products of the farmers are shipped to the market through the JA.

One of the important services being provided by the JA is farm guidance. Such guidance is focused on reducing cost of production and enhancing the safety and quality of products produced by the members in order for its agriculture to become more competitive internationally. Due to the aging of the farm population and shortage of labor, the Cooperative plans to open and operate a free consulting office for part-time work to secure farm labor and promote employment in the area.

Other activities of the JA include banking (savings and loans), mutual aid, purchasing of farm inputs and materials for daily living, warehousing and other ancillary services such as travel, supply of house and lot, cultural programs, etc. In FY 2000, the Cooperative earned a total profit of ¥226 million from all these activities.

After the briefing, the participants were taken to the shipment area where the products of the farmers are collected and inspected for shipment to the market. The participants had occasion also to visit a farm growing cucumber and tomato in greenhouses.

Tatebayashi Agricultural Improvement and Extension Center

The Director of the Extension Center, who together with his staff gave a short briefing about their extension activities, welcomed the participants.

The jurisdiction of the Center covers Tatebayashi-shi and five other towns involving 6,607 farm households, 1,023 of which do full-time farming. The major crops grown by the farmers are rice, barley and cucumber. Other crops include flowers, fruits and dairy products. Total area for paddy is 7,800 ha, of which only 5,700 ha are utilized with the balance earmarked for conversion to other crops. Barley takes up some 1,400 ha while wheat is grown in 900 ha of farmland. During FY 1998-99 gross output of rice was ¥7 billion, that of barley was ¥1.75 billion and other grain was ¥36 million. Total output of livestock was ¥3.1 billion.

The Extension Center has 17 staff members and its three main sections are Agriculture and Livestock, Horticulture and Successor Farmers. The extension people mainly provide guidance on the growing of seedlings, production technology and other farm operations such as drying. Extension methods used include: 1) the distribution of posters to farmers which contain basic information such as planting calendar, life-cycle of plants, new varieties, disease and pest prevention measures, etc.; 2) seminars conducted at JA facilities; and 3) regular visits to farmers. For specific problems the farmers can contact the extension at any time.

After the briefing the participants were given a quick tour of the facilities of the Center.

CONCLUSION

Agricultural support services have played an important role in the development of the agriculture sector in Asia and the Pacific region. For instance, they have facilitated the adoption of new technologies and practices which has led to significant improvement in the productivity of many crops over the years. They have also been instrumental in promoting the sustainability of farming operations. Providing the services in an adequate and efficient manner, however, has not been an easy task in many of the countries in the region.

Dwindling government resources have served to curtail the coverage of the services. The globalization of the world economy has also somewhat narrowed the options open to developing countries in terms of the kind of support that can be given to the farmers. For instance, under the WTO regime, price subsidies can no longer be favored and in fact have to be increasingly reduced. Other measures that distort markets will also need to be eliminated.

It is under this scenario of an increasingly globalized environment that support services in the form of more effective research and extension, more accessible credit and better market facilities can play a bigger role. The Seminar revealed that several problems/constraints are common to many of the participating countries. As a result, it became relatively easier to come to a consensus as to what measures could be adopted to overcome the constraints and accordingly improve the delivery of agricultural support services, particularly to small farmers in the region. The problems and constraints, as well as corresponding measures have been identified during the workshop discussions. Some of the important conclusions from such discussions may be summarized as follows:

1) There is a need to further strengthen the group approach as a key strategy for enhancing the effectiveness of support services for small farmers.
2) The role of government should shift from one of implementor to that of facilitator and enforcer of laws.
3) Since government resources are getting to be more and more limited, more government-private sector partnerships should be promoted.
4) Information technology should be quickly and increasingly applied in strengthening agricultural support services since it can provide great benefits to small farmers.
5) Networking and experience sharing, particularly about success stories among countries would be an effective way of disseminating many innovations and new ideas.

The Seminar provided the participants an opportunity to review the present situation of agricultural support services in their respective countries and in the region as whole, as well as to discuss measures on how the provision of these services could be made more effective given the limited resources available and the increasing globalization of the world economy. In this regard, the participants felt that through their participation in the Seminar they have gained a better appreciation of the increasingly important roles that agricultural support services are playing and how these services could be enhanced to further promote the growth and long-term sustainability of agriculture in the region.

1. PRESENT SITUATION AND CHALLENGES OF AGRICULTURAL SUPPORT SERVICES IN ASIA AND THE PACIFIC

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INTRODUCTION

Asia-Pacific Region

The Asia-Pacific region is the second largest region in the world after Africa and the Near East in terms of land area. It covers 2.8 billion ha, or just under a quarter of the world's total land area. A little over half of the land is used for agriculture (permanent and arable crops and pasture). The remainder is divided equally between forests and other land types. The region has the second lowest proportion of land covered by forests. In terms of population, the region covers half of the world's population. India and China account for nearly 70 percent of the region's population of 3,112 million. Poverty is widespread, especially in South Asia. Agriculture remains the main provider of employment accounting for 21-93 percent in the various South Asian and Southeast Asian countries.

Agrarian Structure

While substantial differences in agrarian structure exist across and within Asian countries, they can be classified into three broad categories:

* Countries where collectivization of agriculture has been practiced, with equitable distribution of resources and a large segment of the population involved in production, now gradually opening up to market forces (Vietnam, China, Democratic People's Republic of Korea, Cambodia);
* Countries that have undergone agricultural modernization and some level of land reform, with a lesser segment of the population directly involved in agriculture (Japan, Taiwan, Republic of Korea); and
* Countries where traditional patterns exist with a feudal or semi-feudal character, with land held by absentee owners or corporations and which are increasingly exposed to market forces and modernization, a large portion of the population is involved in production, mostly in subsistence agriculture (most countries of South and Southeast Asia).

Declining Per Capita Arable Land Availability

Overall nearly 60 percent of the labor force in Asia are in agriculture and arable land available per capita is 0.50 ha. Four of the five South Asian countries have 46-65 percent of their labor force in agriculture (Nepal has more than 90 percent) and the arable land available per capita ranges from 0.24 to 0.84 ha. For Southeast Asian countries, the proportion of their labor force engaged in agriculture ranges from 40 to 70 percent, and the arable land available per capita is 0.25-0.98 ha (the exception is Malaysia which has only 21 percent of their labor force in agriculture, and 4.24 ha of arable land per capita). China, on the other hand, has 68 percent of its labor force in agriculture and 0.27 ha of per capita arable land.

Deteriorating State of Natural Resources

Land degradation and increasing water scarcity also confront the Asia and Pacific countries. Per capita water availability fell by half from 1950 to 1980 and by a further one-third by the end of the century. A

substantial proportion of Asian croplands is fragile – arid and rainfed semiarid areas, areas with unreliable rainfall and areas with steep slopes and/or poor soils. The region also has the least potential for expanding cultivated areas.

For most of the developing Asian countries agricultural growth has been at the core of their progress contributing largely to the overall economic development and poverty alleviation.

INDIAN AGRICULTURE

Agriculture in India has been the backbone of economic development with two-thirds of the population dependent on agriculture. About 25 percent of the country's GDP is contributed by this sector which also accounts for about 18 percent share of the value of national exports. It supplies bulk of wage goods required by non-agriculture sector and raw material for a large section of the industry.

Green Revolution

During the post-independence era, Indian agriculture has largely been driven by the central concern for food security. Progress under the Green Revolution was spectacular registering a fourfold increase in food grain production from about 50 million mt during 1950-51 to nearly 209 million mt during 1999-2000. With a buffer stock of nearly 50 million mt India has been successful in graduating from an era of food deficits to one of food surpluses. There have been impressive gains in other sectors as well. Oilseed production registered a significant increase from 11 to 25 million mt in the last one decade. With an annual production of over 75 million mt India is now the highest producer of milk in the world. Fish production recorded an increase from 0.75 million mt to nearly 5 million mt during the last five decades. The country has emerged as one of the largest producers of fruit and vegetables.

Opening Economy

Notwithstanding these achievements the problems of food and nutrition security, poverty, and management of the natural resources continue to be of great concern to the policymakers. Further, in the changed scenario, profitability, competitiveness and efficiency in domestic agricultural production would be issues of high priority together with exploiting export opportunities in world markets. With the removal of trade barriers consequent upon the coming into force of the Agreement on Agriculture (AOA) under the World Trade Organization (WTO), India is confronted with the twin challenges of domestic food security with natural source conservation on the one hand and coping effectively with the international trade regime, on the other. With 142 million ha of cultivated area, variable soil texture, extensive irrigation system, varying agro-climatic conditions, highly skilled manpower, extensive research and development (R&D) and extension, and a buoyant domestic market the country is well poised to meet the situation.

Small Farmers

With over a billion population, there are more than 185 million small and marginal farmers, who comprise over 70 percent of all farming households in the country. These farmers largely undertake subsistence farming owing to a number of constraints, viz., lack of access to inputs, credit, technology and other resources, lack of organization and above all lack of education. Small farmers, by and large, remain the most vulnerable to various risks involved in agriculture.

Rainfed Areas

In the first phase of the Green Revolution (mid-1960s to mid-1970s), the small and marginal farmers were largely bypassed. Modern agriculture technology which was based on high-yielding varieties requiring a package of practices including irrigation, fertilizers, pesticides and credit resulted in the benefits of the Green Revolution remaining confined to the irrigated well-endowed regions of the country as also to the resource-rich farmers. However, once the government sponsored tube-well technology demonstrated the benefits of underground water exploitation, groups of farmers through purchase of tube-wells were able to take advantage of the high-yielding varieties. The vast rainfed areas of the country, comprising of nearly two-thirds of the cultivated area, however, remained outside the fold of the Green Revolution. The integrated watershed development approach is being followed there.

Strategies for Small Farmers

The present thrust is therefore, on evolving strategies to improve the status of small farmers through diversification and commercialization of their agricultural activities. This will imply implementation of

agricultural policy reforms, optimizing input efficiency, introducing sustainable agricultural practices, bringing about institutional change and improving institutional capacity, developing human resources and encouraging greater participation of the non-governmental sector in agriculture.

COMMON CHARACTERISTICS OF SMALL FARMERS

Common Characteristics

Small and marginal farmers across the developing countries of Asia and the Pacific region have certain common characteristics. The FAO (1990) have described small farmers as: (i) seasonal producers; (ii) fragmented buyers and suppliers unable to exploit economies of scale; and (iii) dominated by household economics where functions such as consumption, investment, work and social activities are undifferentiated and unspecialized. In contrast, buyers and service providers who operate in the market tend to be large-scale operators (at least in relation to farmers); commercially driven; specialized by commodity, process, productive assets or services offered; able to exploit economies of scale; and aiming to even-out operations through the seasons.

Need for Linkages

Effective linkages need to be developed between farmers and service providers and purchasers of agricultural produce to strengthen support services for small farmers. At present such linkages are either non-existent or very weak. A number of factors govern the development of these linkages such as the external environment in which farmers and service providers operate as well as the nature of product and processing involved, viz., (i) poor transport which limits trade and for some products, such as perishables, may be impossible; (ii) lack of telecommunication facilities which place spatial limits on business and raise risks and costs; availability of utilities which determine the type of processing that is possible; and (iii) if contracts are unenforceable and property rights unprotected, transactions may be restricted to kin and longstanding relationships of trust, excluding majority of business opportunities and shifting innovative initiatives.

CONSTRAINTS FACED BY SMALL FARMERS

Although modern agricultural technology is supposed to be scale-neutral, in practice, various factors like the community's power structure, uneven access to agricultural extension and information services, inability to obtain adequate irrigation water (without which the biotechnology package generally cannot succeed) and unavailability of credit act as deterrents, giving large farmers a clear edge over small farmers. Small farmers' constraints stem mainly from their limited land area, low levels of farm output and income, very little net surplus, and consequently, extremely limited possibility for farm investment out of their own resources. Fragmentation of landholdings, in some countries, have accentuated the above problems. The rural markets in these countries are also functioning in a way unfavorable to small farmers. They do not receive timely market information and experience considerable difficulties in obtaining access to government services such as extension. Constraints faced by small farmers may be broadly classified in the area of (i) production, (ii) input supply, (iii) credit, (iv) marketing, and (v) value addition.

Production Constraints

Small Size of Land-holding

The small size of their landholding makes it difficult for small farms to become viable economic units, specially in rainfed conditions. Small farmers are compelled to augment their operational area through tenancy or leasing-in land. Most tenants are landless or small landholders. The bigger farmers enter into such arrangements to cut down on management costs of hired labor. In some countries the terms and conditions faced by the tenants are unfavorable. In particular, it is increasing felt that with the onset of the process of 'reverse tenancy' in the Green Revolution areas of Asia, the small farmers are being driven further down in the land-lease market. In a Bangladesh country study, in addition to promulgation of a government ordinance in 1984 to protect tenants, it was reported that no definite action was visible in enforcing such laws and, as a result, the system has remained unchanged.

Biased Tenurial Systems

In India the objective of land reform and the enactment of legislation was to ensure land-to-the-tiller. This implied that the formal lease market got virtually frozen, as any landowner admitting to leasing out his land was in danger of losing the land to the tenant (tiller). Field studies, however, reveal that the percentage of cultivated area under hidden tenancy ranges from 10 to 30 percent in various parts of the country. Tenancy is not documented and remains founded on verbal contracts of cost- and crop-sharing. Such informal tenurial system has been the cause of less-intensive use of labor and other inputs, slower adoption of technology, low levels of investment for land improvement and other fixed capital inputs, leading to low levels of output. With no documentary-proof tenants are also unable to access institutional credit and must take recourse to private moneylenders for purchase of inputs.

Inefficient Water Management

In most developing countries of Asia and the Pacific investment in irrigation infrastructure has been the single largest investment expenditure in agriculture. However, irrigation systems in several countries suffer from inefficiency, deteriorating equipment and infrastructure, lack of operation and maintenance and misallocation. Many of the problems are traceable to the policy environments in which the investments were made and operated (particularly the underpricing of water) and their management by government. Water charges do not even cover the cost of operation and maintenance of the irrigation system, much less servicing the capital costs to build it.

Disadvantaged Smallholders

Unrealistic user costs lead to inefficient overuse of water. Farmers at the head of canals often flood their fields as a substitute for weeding while those at the tail-end scarcely receive the bare minimum. There are no incentives to design projects, or for users to behave, so as to conserve an artificially cheap resource. Because of the limited cost recovery, projects must be funded from general revenues. Aside from the budgetary implications, this implies that irrigation agencies are not accountable to farmers. This overuse of water in the fields, as well as large quantities that leak from silted-up, damaged or obstructed canals in transit result in waterlogging (causing loss of productive land) and salination. The absence of a realistic user demand is also leading to indiscriminate mining of underground aquifers resulting in declining water table. These have perverse equity implications. The big farmer's powerful water pump lowers the water table drying up the small farmer's shallow well. This dispensation prompts both the dominant and resourceful user as well as managers of the government delivery systems, having the authority to ration the resource, to earn rentier incomes through the appropriation of disproportionate share of benefits. In the process small and marginal farmers and tail-enders of the canal systems remain at a disadvantage. In Bangladesh, it is reported that although small farmers irrigate a larger proportion of their land, they pay higher water charges. Village studies have reported that those who can afford to pay water charges in advance get water at a cheaper price (about 25 percent less) than those who pay after the harvest.

Input Supply Constraints

Availability of inputs has always been a major constraint with smallholders. Specific input supply constraints observed across major inputs are: (i) lack of access to inputs; (ii) inadequate availability; (iii) quality; (iv) non-availability in affordable packages; (v) lack of timely support; (vi) lack of knowledge; and (vii) lack of location specific and small farmer friendly technologies/inputs.

Distortions Caused by Subsidies

The use of subsidies in demonstrating and popularizing new agricultural technologies and modern inputs is well recognized, but continuation of these subsidies well beyond the achievement of that objective, needs to be reexamined. Subsidies on agricultural inputs compensate the poorest farmers to a small extent only, as they use few purchased inputs. It is felt that subsidies have led to misallocation of resources, imposed a burden on government budgets and to the extent they increased unjustifiably the use of chemicals, caused environment damage. At the micro level, underpricing of fertilizer causes distortions and leads to overuse of subsidized nutrients and imbalance in NPK ratios. In India, the issue of input subsidies is being critically examined for further rationalization.

Provision for Quality Control

Seed multiplication and marketing are activities which the private sector can perform efficiently. In the area of cereal seeds these functions have been in the public sector. In horticulture, seed and planting

material is being developed and marketed largely through private agencies. In recent years, both with a view to affecting economies as well as promoting marketing efficiencies, there is a move towards increasing the role of the private sector. In India, the government's Seed Policy in 1988 opened the gates to importation of high-tech genetic material and technology and much greater participation of domestic and foreign companies in the Indian seed market. Provisions under seed legislation are being strengthened to ensure that substandard quality seed is not sold to farmers by private companies.

Lack of Ability to Diversify

Some countries (e.g., Thailand) have also reported a cropping pattern constraint as regards small farmers. As compared to large farmers, small farmers follow mono-crop practice. This makes them risk-prone and restrict production and income potential with limited options available for diversification. As regards the mechanical component of available modern technologies, the small farmers being resource-poor are not well mechanically equipped.

Location Inaccessibility

Some studies have reported location inaccessibility as constraint. Smallholdings in distant locations lacking connectivity by road would encounter difficulties in practicing recommended technologies and selling their produce in suitable markets. This apart, small farmers may also be deprived of public extension services or input supplies and commercial services owing to adversity of locations.

Credit Constraint

Lack of Access to Credit

Small farmers are at a disadvantage in accessing credit. On the other hand, large farmers have the greater access and enjoy far better credit support provided by various credit institutions. However, one study concludes that in South Asia it is not the credit constraint but imperfect markets for the supply of input that constrain small farmers. There is also the argument against the policy of providing subsidized credit. Experience indicates that not only has it hardly worked, but furthermore, it threatens the viability and discipline of credit institutions.

Demand for Credit Package

A further constraint experienced by small and marginal farmers is that they often are under debt to private moneylenders. They need credit for carrying out current farm operations. Small farmers require a credit package covering production, investment and consumption credits, and if necessary, credit for redemption of prior debts. Such packages are not available to them in formal credit markets.

Inadequate Access to Markets

This is an area where farmers are handicapped in general, and small farmers in particular. It is generally perceived that agricultural marketing begins with postharvest operations. Indeed with the crop standing in the field, marketing affects field operations too. It influences harvest timings, minimizing damages, maintaining market preferred quality, value addition and treatment of crop field from marketing angle, packaging preferences, quality standards, minimizing transport cost as well as transport losses, use of cool chains or cold storage facilities, marketing mechanism, rural regulated markets, regulated or support prices. Knowledge and adoption of these practices are very important for farmers to market their produce to earn reasonable profit. Apart from farmers, extension functionaries also need to undergo training on market-related skills. However, the lack of these practices/skills are rampant among both farmers and extension functionaries. Therefore, there is a great need to make concerted efforts to make market-related environment conducive to small farmers' need.

Lack of Value Addition at Farm Level

Increasing Demand for Processed Foods

Growing affluent middle class is leading to increased demand for high value agricultural commodities. In the case of India it is estimated that during next decade annual demand for high value commodity like fruit (5.4 percent), vegetables (3.5 percent), milk (5.2 percent), meat (5.1 percent), eggs (5.1 percent), fish (5.6

percent) and sugar (3.0 percent) will rise much faster than food grains (2.2 percent) – wheat (2.2 percent) and rice (2.1 percent).

Lack of Processing Facilities

Despite the rising demand for processed foods in India, less than 5 percent of agricultural produce is processed by the organized sector. As a result of their low retention capacity, small farmers are often forced to sell their surpluses at low prices or under distress sale. Postharvest processing and value addition at farm level would provide relief to the producers.

Need for Local Level Processing

There is need for small-scale farm level processing and value addition for agricultural produce particularly at primary level, viz., fruit and pulp making, pickle making, preservation of vegetables, jam and marmalade. Value-adding techniques provide higher income to the small farmers. This will need to be supported by access to market information and linkage with potential markets where the processed produce could be sold. Agro-processing units in semi-urban centers would create employment generation. Agro-processing units will create further demand for agricultural produce. This will ensure reasonable remuneration and increase in the income of small farmers. Lesson learnt from the White Revolution is itself a guiding beacon for commercialization in areas of dairying and animal husbandry. "Operation Flood" (OF) provided the example of large-scale modern milk processing fed by a well-organized milkshed, procuring milk from a large number of small producers in small amounts.

Weak Organizational Capacity

Agriculture the Unorganized Sector

Unlike the industrial sector, the agriculture sector comprising of millions of scattered landholdings remains unorganized and is not conducive to collective bargaining. This is even more applicable to small farmers who lack bargaining capacity. Small farmers, being generally less educated, are often serviced by agencies which exploit their lack of knowledge. There is need for small farmers to get organized. However, sometime small farmers are in competition with each other which prevents their coming together for a common interest. Often caste loyalties also prevent such unions.

Among other economic constraints, a Malaysian study has reported the problem of low agricultural prices, less impact of subsidies and lack of import tariffs as factors that invoke among them the lassitude towards food production in Malaysia. The Malaysian study has also drawn attention to a research constraint. The approach of these researches in the past had been 'crop' development-oriented rather than 'crop farmers development-oriented'.

STRATEGIES FOR STRENGTHENING SUPPORT SERVICES

Land Reforms

Land Tenancy Reforms for Empowerment of Tenants and Sharecroppers

To enable the smallholders and the landless to gain from such a situation, the issue of land reforms – land ceiling and land tenancy – needs to be looked at afresh with the view to creation of as many viable landholdings as possible. Tenancy laws need to be amended to encourage the landless and near-landless to lease in land from bigger farmers, whose ownership rights must be protected. With tenancy becoming legalized and formalized, tenants can provide documentary-proof to financial institutions and procure loans. Thus if the lease market is freed, pure tenants and small and marginal farmers would be able to enlarge their operational holdings by leasing in area and making better use of land and family labor. With agricultural diversification gaining ground, cost of inputs for cultivation of high value cash crop will increase and credit will become a necessity.

Production-based Land Reforms

A regime of production-based land reforms as contrasted with a mere equity-based land reforms would allow on the one hand landless and marginal farmers to augment their landholdings by leasing land from the big farmers and on the other corporate farmers to lease from the marginal holder who may not have the investment capacity. Ownership rights, in both cases must be fully protected and enforced.

Consolidation of Landholdings and Improvement of Land Records

The former will encourage investment in land by improving the creditworthiness of farmers. Special incentive need to be provided for consolidation of landholdings. In some countries legislation has been enacted for consolidation. Streamlining of land records through computerization will lead to greater transparency regarding land rights, tenancy, etc., and reduce uncertainties that cause avoidable litigation.

Recognition of Women's Rights in Land

In their distribution of surplus ceiling land or community lands to the rural poor, several State governments in India are issuing the lease (*patta*) in the joint names of husband and wife. Self-help groups (SHGs) of women are being encouraged to lease in land as a group, undertake cultivation and market the produce.

Water Sector Reforms

New approaches to water resources management need to emphasize that water is an economic good which needs to be priced so as to ensure that its use reflects its value. Two successful cases have been described in Boxes 1 and 2. Reforms in this area would comprise:

* rationalization of irrigation charges to reflect realistic costs
* institutionalization of water markets which enable competitive trade in water
* establishment of water rights: These rights based on volumetric basis should be tradeable, recorded, enforceable and separate from land rights; entitlements of tail-end users of canal waters should incorporate the accountability of excess drawls by upstream users
* legislation to ban/restrict drawl of groundwater in regions where water tables are declining
* promotion of user communities in the management of public or publicly funded water systems
* watershed approach to development of rainfed farming.

Box 1: Water Users' Associations in Andhra Pradesh, India

In 1995 the State Government of Andhra Pradesh (AP) prepared an action plan for the promotion of farmers' participation in the management of irrigation which became highly successful and a role model for other countries to follow. The highlights of the action program were:

* Formation of Water Users' Associations (WUAs), autonomous bodies functioning within the purview of the AP Irrigation Utilization and Command Area Development Act covering approximate area of 400-750 ha.
* WUA to be fully responsible for the maintenance and operation of the irrigation network within the area of their operation.
* The endeavor of the Department of Irrigation was to give increasing responsibility of managing irrigation systems to WUAs with a view to: (i) making available assured and reliable water at the head of minor; (ii) undertaking rehabilitation and modernization of the internal water distribution system; and (iii) facilitating fixation and collection of operation and maintenance charges from water users.
* WUAs would be at liberty to regulate distribution of water to water users on volumetric or any other basis. By improving efficiency of the irrigation system the WUAs would be at liberty to save water and make the water so saved available to users on payment.
* NGOs worked with farmers in the command area to form WUAs which were registered as legal bodies. Their activities have further been supplemented by a distributory committee federating all the WUAs under the distributory. Encouraged with the impact of WUAs Government of AP has gone for amendment of the AP Farmer's Management of Irrigation System Act 1997. At present AP is the State with highest number of WUAs (9,800 in number) covering an area of 4,315 thousand ha.

Box 2: Banas-Khari-Samadhi Watershed, Gujarat, India

Gujarat is one of the most arid States in India where 80 percent of the cultivated areas is rainfed. Banas-Khari-Samadhi Watershed is located in Banaskanta district of Gujarat, covering two villages having an area of 3,193 ha and 1,411 beneficiaries. The project was initiated in the year 1991-92 and ended in 1997-98. Impact evaluation studies have shown that:

* groundwater level increased by 10-15 percent resulting in increase in irrigation
* cropping intensity doubled
* crop yield of cereals and oilseeds rose by 38 percent
* fodder availability increased by 22 percent and milk production by 30 percent
* over 1,000 compost pits were constructed
* labor-oriented works generated more than 100,000 man-days of employment thereby reducing migration from the villages
* income of participating households increased on an average by 50 percent
* biomass in the watershed increased, as did the canopy cover
* soil and water conservation work has accelerated regeneration of natural species in the area

Some of these measures have been initiated by various countries with varying degrees of success, however, a great deal remains to be done. In India, farmers' participation in the management of water both in the command areas of irrigation canals as well as in watershed development in rainfed areas has become a central strategy. There are several successful models which are now being replicated and mainstreamed into national policy.

Reforms in Technology Dissemination

Reforms in the agricultural extension system encompass a restructured technology dissemination system, based on a multi-agency system, comprising of the public as well as the private sectors (Boxes 3 and 4). Innovative, decentralized institutional arrangements need to be promoted to make the extension system farmer responsive and farmer accountable. The thrust of the reorganized technology dissemination mechanism will be to:

* ensure greater farmer participation in determining research and extension agendas;
* strengthen research-extension linkages;
* allow greater location-specificity in both technology generation and dissemination;
* emphasize more sharply the provision of knowledge and skill-based technologies as opposed to material-based technologies which can be increasingly left to the private sector;
* forge new partnerships between public institutions, technology users, private sector and NGOs;
* mainstream gender issues in technology generation and dissemination;
* harness information technologies more effectively for technology transfer;
* improve financial sustainability of the technology dissemination systems; and
* create an enabling policy environment at the State level that allows for institutional arrangements wherein the comparative advantage of the public and private sectors can be optimally harnessed for rapid and cost effective technology dissemination.

Agricultural Credit and Financial Services for Small Farmers

To meet all the needs of small farmers institutional finance through the rural banking system may not be a practical proposition. In such a situation informal system operating at rural level offer an alternative means of credit and finance. Few of such systems are:

* finance through input dealers
* finance through buyers of farm produce
* finance through thrift and credit societies.

Box 3: Innovations in Technology Dissemination

The Ministry of Agriculture, Government of India is implementing the National Agricultural Technology Project (NATP). Innovations in technology dissemination (ITD) are being pilot-tested through new organizational arrangements and operational procedures for extension delivery by decentralized decision-making at district level and below. An Agricultural Technology Management Agency in 24 project districts spread over six States in the country has been established as an autonomous agency with farmers as major stakeholders. Main objectives of the ITD component are:

* increase the effectiveness of technology dissemination system by making it demand-driven and responsive to location-specific issues of farmers
* bring in bottom-up planning procedure for technology dissemination
* develop and strengthen institutional linkages that would result in shared objectives and ownership of system by key stakeholders
* empower farmers through farmers' organizations/associations to play an active role by making the technology dissemination farmer-driven and farmer accountable
* increase financial sustainability of technology dissemination
* develop new partnerships between public-private sector extension

Box 4: Success Story of ATMA Khurda, Orissa, India

Agricultural Technology Management Agency (ATMA) Khurda was registered as an autonomous institution in 1998 under the NATP. This Agency was created with the aim of pilot-testing new institutional arrangements and operational procedures involving a farmer-centric, decentralized decision-making process at district level.

This Agency has begun showing impact of innovative strategies pilot-tested over the past two years. Some of its achievements are:

* increase in acceptability of technology due to farmers involvement in identification of technology gaps
* active involvement of scientists on farmers field
* result-oriented new technologies addressing location-specific needs of the farmers
* adoption of integrated farming systems
* gradual acceptance for cost-sharing of services
* use of information technology among farmer interest groups (FIGs)
* SHGs of unemployed rural youth ranging from 10 to 20 members with activities ranging from mixed farming to poultry, fishery, dairy, nursery and mushroom cultivation
* diversification with high value crops including floriculture adopted
* credit linkages established with commercial banks; *Kisan* credit cards distributed
* ATMA-supporting establishment of kiosk at *Banpur* market for sale of products like vegetables, eggs and dairy products by the FIGs operating at grassroots level
* success stories identified/documented by ATMA for dissemination to farmers

Financing through Input Dealers

It is common practice that dealers often provide inputs on credit to farmers. The amount is repaid either on instalments or after the crop is harvested. This kind of arrangement works best when the dealer is village-based and knows the farmers concerned. Input dealers may also be prepared to buy the farmers' crop as a general service to the farming community, or in payment for inputs supplied. An arrangement of this type works on mutual trust between the parties. It greatly reduces the administrative costs of financing and credit disbursement.

Financing through Buyers of Farm Produce

In many countries buyers of farm produce such as rice millers, cotton ginners, food processors finance the inputs of local farmers on the understanding that they will buy the resulting farm produce. Such interlinked trade-credit arrangements sometimes fall through because of default at the level of farmers. Such arrangements tend to fail if no marketing or processing monopoly exists with the buyers, if the produce has different end uses, and if no sanctions can be enforced either for political reasons, absence or cost of legal process or ignorance about the defaulters. Such arrangements work better on mutual trust or well-structured agreements between the farmers and the buyers of farm produce.

Thrift and Credit Societies

The success of SHGs and NGOs in several countries of the region has demonstrated that the twin objectives of improving access to credit on the one hand and maintaining sustainability of credit institutions through reduced transaction costs, on the other, may not be mutually exclusive. The classic model of the Bangladesh Grameen Bank has been adopted by several other countries. By and large, members of SHGs are assetless rural poor – women, tenant farmers, agricultural laborers and rural artisans. Not only have these small and homogeneous groups been able to mobilize member savings, thereby showing that the rural poor have much higher saving capacities than hitherto recognized, but are also lending to their members, small consumption and production loans at interest rates ranging from 24 to 60 percent per annum, indicating that arguments for low interest rates in general might be invalid. What is important is adequate, timely and uncomplicated access to credit. It may well be that the benefits of subsidized interest rates are largely being cornered by a minority of privileged and powerful rural borrowers.

Marketing Options

Agriculture Produce Marketing Yards

Agricultural Product Markets Act and Market Development: The Agricultural Product Markets Act (APMA) was enacted by the states in India to regulate the marketing of agricultural produce, including livestock, to improve their efficiency and in the process ensure a more equitable distribution of gains from agricultural trade among consumers, traders, and producers. The Uttar Pradesh Krishi Utpadan Mandi Samitis Adhiniyam (1972) and the Punjab Agricultural Produce Markets Act (1961) are examples of this legislation. The Act governs the establishment of markets for agricultural produce and of marketing committees in each market area. The marketing committees are responsible for implementing and enforcing the provisions of the Act and are empowered to regulate access to the markets, charge market and license fees, and issue, renew, suspend, or cancel licenses. The one-time marketing fees range from 1.0 to 1.5 percent of the value of the commodities. Revenues generated under the Act are supposed to be allocated to the markets, particularly for the operation and maintenance of the market yards and the development and improvement of market facilities and related development works and activities. The marketing committees are supervised by the State Agricultural Produce Market Board, which is responsible for statewide market development.

Structural and management problems, however, contribute not only to a lack of consistency in fee collection, but also to the inefficient allocation of the revenues collected. A large portion of the revenue is often diverted to other uses instead of being reinvested to improve the market facilities or services (such as sanitation, cold storage, grading, and weighing facilities, and market information). Limited financial authority of the respective marketing committees constrain access to the necessary capital to properly operate or upgrade the agricultural market facilities. Inadequate accounting standards have further contributed to rent-seeking activities. There is a need to rationalize the revenue-generating and capital allocation responsibilities of the institutions involved in agricultural market development. The frequency at which fees are collected needs to be clarified and made more transparent.

Direct Farmer to Consumer Marketing

Rythu Bazaar: *Rythu* bazaar or farmers' market is a concept that has evolved out of the need for marketing and consumption of perishable commodities like vegetables in the State of Andhra Pradesh in India. These bazaars are markets where farmers bring their own produce and sell them. The farmers are not only the producers but also the sellers directly to the consumers. The process has eliminated all middlemen and hence the farmer gets a higher price and the consumer a lower one than through the traditional system

involving wholesalers and retailers. *Rythu* bazaars started functioning from January 1999 onwards. There are around 70 *Rythu* bazaars which are in operation in the State. They are located on government/municipal lands identified by the district collectors. Amenities in the form of sheds, sanitation, water supply are created with the funds of Agricultural Market Committees (AMCs). Weighing scales and trays for keeping the vegetables are provided to the farmers. Villages have been identified for coverage of each *Rythu* bazaar for the flow of vegetables and other products. Arrangements have also been made for plying of State Road Transport Corporation for the transport of produce from the village to the bazaars at appropriate times. Photo identity cards have been issued to the farmers for entering into the *Rythu* bazaars.

Rythu bazaars have made a significant impact on various sections of people. The main factor of success is the stabilization of prices of vegetables and other commodities in the local markets. In fact, display boards are placed in most of the super bazaars indicating their prices as on par with *Rythu* bazaar prices. The *Rythu* bazaar prices have become referral prices for all concerned. The consumers are satisfied with the variety, freshness and cost of product they are getting in *Rythu* bazaars which is 20-30 percent less than the common market price. The farmers are happy since they are able to sell their produce and get better returns. They are also able to assess market demands and tend to respond better to market.

Cooperative or Group Marketing

While individual marketing is often constrained by economies of scale, cooperative or group marketing is able to overcome this constraint. To keep such an arrangement functioning smoothly, farmers need to:

* organize themselves into groups to ship their produce to buyers or market places;
* identify buyers and find out about their prices, terms and conditions; and
* organize themselves to assemble their produce in a central location, to make it attractive for buyers to visit the farming community.

Federating such farmer groups into producer cooperatives could greatly help the small farmers in operationalizing the above arrangements apart from providing services, such as gathering and dissemination of market information, provision of marketing extension and training, and advertising campaigns. The classic success story is that of the Anand model of cooperative marketing of milk under the Operation Flood Program (Box 5).

Box 5: Operation Flood – Success of Cooperative Marketing

Operation flood was launched in 1970 to promote the integrated development of the dairy sector. Its main objective is the creation of farmer-owned and farmer-controlled organizations based on the Anand pattern of cooperative development. In setting up dairy cooperatives, the OF sought to capitalize on the beneficial features of cooperatives. The cooperatives would (i) provide farmer members an assured market for their output which is critical for a perishable commodity like milk; (ii) offer a farmer-controlled mechanism for delivering essential support services; and (iii) enable farmers to directly share the benefits from the returns generated by the cooperative. The National Dairy Development Board (NDDB) was established to oversee the planning and implementation of the program.

OF has been successful in spreading the dairy cooperative concept and providing an important demonstration effect on the potential for dairy development in India. In its 25 years, OF has replicated the cooperative model in more than 200 districts. 8.4 million member farmers (estimated to be about one-third of the total dairy farmers) were supplying 5 million mt of milk to 65,000 milk cooperative societies, who in turn delivered the milk to 170 milk unions for processing and marketing. In addition, the program provided training, extension, animal health, and artificial insemination services to its members and the NDDB, through its research institutes, conducts livestock research.

Contract Farming

Basic Features: Farmers enter into a contract with the central agro-processor or buyer who agrees to buy part or all of their future crop. Companies may supply inputs, prepare the land, and provide extension, packaging and transport services. In extreme cases taking over of responsibilities by the company can go so far that the farmer is little more than a laborer on his land. Examples of successful contract farming as

support to small farmers are tobacco production, sugar production through sugarcane processing factories and processed vegetable (Box 6 and 7).

Box 6: Produce Buyers for Tobacco in Malaysia

Tobacco growers in Malaysia are linked, traditionally, to a tobacco curer. Typically, each curer has some 60-70 farmers depending on him or her for: fertilizers and other inputs; credit; and purchase of the uncured tobacco leaf.

Curers make arrangements with the Bank Pertanian Malaysia (the State-owned agricultural development bank) to finance their bulk purchase of inputs.

Through this interlinked set of transactions small tobacco farmers are given access to a range and quality of services which on their own they would not be able to obtain on account of the smalle scale of each individual operation.

Box 7: Success Story – MAHAGRAPES

MAHAGRAPES is a cooperative of grape farmers in the State of Maharashtra, one of the largest producers of horticultural crops in India. With a substantial increase of grape production the domestic market was flooded with the fruit. As a result prices of grapes fell to very low levels. It was difficult to recover even the cost of production prior to 1989. A need was felt to explore new markets outside the country. It was in 1989-90 when an enterprising farmer sent a one million mt consignment of table grapes to U.K. Initially Indian grapes got a luke warm response but soon the European buyers were convinced about the quality and started developing an interest in importing Indian grapes. Encouraged with the rising market response, in January 1991, an organization called MAHAGRAPES was born under the cooperative sector in Maharashtra with the following objectives:

– Elimination of middlemen/traders from the marketing process for the well-being of the farmers
– Growth of cooperative movement
– Encouragement and development agricultural export
– Provision of all extension services and inputs to the members

In keeping with the international trend of fruit growers becoming exporters, the vineyard owners of Maharashtra entered international market with their own brand "MAHAGRAPES". The grape growers in four districts formed 16 cooperative societies with almost 2,000 farmer members. All the member cooperatives are partners of MAHAGRAPES. Today MAHAGRAPES has a sizable export market in grapes.

Nucleus Estates/Technology Parks/Agro-Poles

This employs setting up of a large-scale central processing and marketing facility, supported for raw material by a plantation nucleus as well as outgrowers supplies. The plantation nucleus is vertically integrated with the nucleus estate (processing unit) whereas outgrower supplies are with long-term agreement subject to annual renewals and well defined terms of contract (for prices, transport changes, advances for inputs, etc.) The small farmer groups form partners in the outgrower supplies. This kind of arrangement facilitates large-scale production without total dependence on outgrowers for raw material, and low cost of inputs to be procured in bulk for the plantation nucleus and the outgrowers. The small-scale farmers at the same time get assured prices for their produce apart from credit, specialized services and inputs (Box 8).

Most of the nucleus estates, or agro-poles have been mainly operating with industrial crops. A prominent exception is the Indian milk producers' scheme under the NDDB (the Anand model), which represents a partnership of millions of small producers linked to a strong processing and marketing enterprise. In contrast, several of the existing NES schemes in Indonesia's estate crop sector, set up under government direction, are under pressure to transform as the state-owned nucleus estates are no longer capable and willing to deliver services.

Box 8: Changing NES Concepts in Indonesia

Out of over 13 million ha of tree crops in Indonesia about 800,000 ha, mainly oil palm, were developed as Nucleus Estate/Smallholder (NES) schemes. The nucleus plantation and central processing factory are typically State-owned. In surrounding smallholder plantation areas (plasma) the nucleus is expected to maintain infrastructure, while state-supported cooperatives (*Koperasi Unit Desa* or KUD) ensure collection and transport of Fresh Bruit Bunches (FFB). For a number of reasons, such as rising cost of servicing the plasma, inflexibility and bureaucratic conduct of cooperative services, industrial disputes between the nucleus management and the smallholder community, diversion of FFB to small private oil mills established in the vicinity, the NES symbiosis is collapsing. Government is now committed to privatize State-owned companies, including NES, under agreements with IMF and is keenly seeking new models for smallholder-nucleus integration. As the past approach towards smallholders has failed it is now seen inevitable to build up viable farmers' groups and associations. From grassroots groups can build themselves up into hierarchies of associations that will be able to undertake some of the less capital-intensive types of postharvest activities and own the related facilities. A promising model of such an approach in the oil palm plantation sector is the GTZ-supported Ophir project in West Sumatra. It has successfully organized a three-tier structure of farmers' groups, cooperatives and cooperative associations that at each level have clearly defined responsibilities following a subsidiary principle. At the top level it includes collective negotiation with nucleus management on prices, conditions and services. The farmers' organizations have also lifted smallholder plantation yields to 35 mt FFB per ha, which is far above the Indonesian average, while repaying plantation establishment loans 8-10 years before maturity.

Strengthening Storage Facilities at Village Level

India has an organized network of procurement, storage and distribution of food grains through public agencies like Food Corporation of India, warehousing corporations and cooperative sector. Despite the massive infrastructure, small farmers need to store a sizeable quantity at village level for food, feed and seed purposes in addition to the stock meant for sale during need. Capacity of small farmers in terms of farm level storage infrastructure and technical know-how needs to be built up. Quality preservation before warehousing may be useful, as the farmers are entitled for 75 percent of the value of the deposited goods as loans from banks against pledging of the warehouse receipts.

FARMER EMPOWERMENT THROUGH GROUP MOBILIZATION

Cooperatives

Revitalization of Cooperative Institutions

There is need for structural reforms to improve functioning of the cooperatives and for ensuring greater efficiency and viability. Cooperatives need assistance in phasing out government financial support with a clear and active guidance to improve financial viability and generate internal resources. Greater democratization of cooperative institutions and increased professionalism in their management capacity building is needed through awareness generation, training and participation. In India the legislative and regulatory framework is under consideration for amendment to achieve these objectives.

Community-based Organizations

Promotion of Community-based Organizations

People's participation in managing critical and scarce resources like land, water, credit and the like will need to be given high priority. FIGs, user associations and cooperatives, SHGs and NGOs would not be mere peripheral players in the new dispensation but participate actively by sitting on the management boards and other decision-making bodies. Due representation to landless, small and marginal farmers and women would be given in these bodies.

People's participation and their involvement in the planning, implementation and monitoring of programs will enhance sustainability of such programs and promote ownership and commitment. Planning for rural infrastructure will involve local user groups, particularly farmers, traders and NGOs. This is expected to change the entire system of planning rural infrastructure from a *top-down* to a *bottom-up* approach. Transferring of all operation and maintenance responsibilities of rural assets to the local community is the first step towards achieving this objective.

Reforms for promotion of community based organizations in India comprise:

* timely elections to all tiers of *Panchayati Raj* institutions
* decentralization of administrative and financial powers to *Panchayats*
* amendment of State cooperative acts for deregulation and further democratization
* timely elections to all cooperative societies
* elections to market committees under the State Marketing Committees Act
* watershed development programs to be implemented exclusively through user communities and NGOs
* water user associations for management of irrigation systems
* technology dissemination to increasingly take place through FIG approach
* thrift and credit through SHGs for landless tenants and women farmers.

Where linkages cannot easily be formed due to various constraints, farmers need to be encouraged to help themselves by branching out of primary production and taking charge of their own input supply, marketing and financial services. This can only be done collectively. In the past, it has typically been the task of cooperatives which, like agricultural credit institutions, have suffered setbacks, as they were promoted in a top-down fashion and proved financially unsustainable. Much more modest self-help approaches are currently promoted by development agencies, involving low levels of technology and few, if any, external financial resources. Such approaches cannot substitute for modern agro-industry and agribusiness, but they can be adequate for less specialized functions such as simple primary processing, local transport, and short-term storage of inputs and produce. The basic operational units are voluntary informal groups of farmers that, after strengthening through appropriate group training, may be able to federate into higher level associations and eventually mature into organizations capable of entering into commercial ventures with outside enterprises (Boxes 9 and 10).

Box 9: Interlocking Schemes among Producers and Financiers

In Mindanao, Philippines, small-scale rice farmers needed inputs, credit, drying and milling facilities, and marketing outlets. A privately-owned rural bank financed basic infrastructure (land acquisition, concrete drying floor, buildings and plant) for a drying/milling facility. It was established as a "cooperative", that is, a form of a shareholding company with strong cooperative features such as built upon a sense of members' solidarity rather than capital ownership. Equity is currently a combination of farmers with the loans being backed by the bank. On delivery of wet paddy, farmers receive vouchers from the rice "cooperative", that can be cashed only at the bank, after deduction of outstanding credit for inputs. Processing and marketing are the responsibility of the rice "cooperative".

Cooperation with Advanced Farmers

In some countries larger farms assist smaller farmers in their area with, for example, input supply, mechanization services, technical advice and output marketing. These may be plantation owners or simply advanced farmers, nucleus farmers, "farmer leaders" or "emergent farmers". The small farmers must not perceive such relationships as exploitative. Advanced farmers, to remain credible as a model for the small farmers, should not have inequitable access to resources that are unavailable to the average farmers.

Box 10: Women Farmer Groups in Khurda District, Orissa, India

Women interest group at Begunia block started agribusiness activities like seed sale, farm product sale (milk, mushroom) and also started thrift and credit to meet the requirement of the members. Women society organized in Balianta block provided micro credit to the farmer members. Women interest group at Keranga village (Khurda block) promoted dairy development activity converging credit requirement through other schemes, organized milk sale on cooperative basis. The Keranga dairy group has been empowered substantially – now the group has appointed a retired veterinary doctor on honorarium basis for health cover to cows and poultry not only for their own village but also for adjoining villages.

Farmer Interest Groups Federated into District Associations

Because of resource constraints and meager holdings small farmers' capacity building is a major strategy which may lead to their empowerment for taking decisions on key farm issues. In India, under the NATP, FIGs operating at grassroots level on commodity/activity base are being strengthened. These village level groups have started federating at the block level which is the next level in a three-tier system, which in turn will further federate upwards into district unions. Representatives of district level body would be members on the Governing Board of the ATMA whereas representatives of the block unions would function as member of the Farmer Advisory Committees (FACs) operating at the Farm Information and Advisory Centre established under ATMA at block level. This kind of federation would enable the farmers to take up variety of entrepreneurial activities at the farm level.

Changing Role of State Agencies

Role of State in Effective Regulation and Enforcement

As the multi-agency extension regime proliferates with private sector, media and information technologies playing an increasing role, the responsibility of the State for effective enforcement of legislation which ensures quality control of inputs such as seeds pesticides, fertilizers, etc. will increase. State's role as arbitrator of conflicts between various private sector extension agents will also increase and systems to address grievances will need to be developed. This role will increase as the number of private extension agencies grow. Guidelines for private agencies would be required. However, in the emerging pluralistic scenario the role of public extension would need to be redefined from one of solely a provider of services to become increasingly an appropriate mix of provider, coordinator, facilitator and regulator. The large section of small and marginal farmers and landless laborers as well as remote and backward regions would continue to need the services of the public extension functionaries, as they are not likely to be serviced by a competitive private sector in the near future. Public extension's role would increase in arbitration of conflicts, assuring accountability of all service providers to the farmers and ensure transparency through provision of information. The overall environment of private provision of extension services, deserves to be encouraged through policy reform and institutional changes so that rural people's needs are serviced more efficiently.

The governments can support the process of producer-purchaser linkages by (i) developing physical infrastructure in the form of suitable communications and facilities, roads and transport and rural urban markets; (ii) strengthening and evolving the institutional and legal structure for enforcing contracts among all concerned private actors; (iii) providing a level playing field to ensure fair and transparent competition; and (iv) involving stakeholder participation to reduce conflict.

Creating an Enabling Environment

Generally, this implies appropriate legislation, rules and regulations, and application of the rule of law. In particular, it implies that private contracts and property are protected and a judiciary exists to enforce contracts without partiality and undue delay. Governments can also set minimum standards and norms for commodities such as food, pesticides, and packaging materials when it is in the interest of public health. To protect the weaker of the contracting parties, governments can propose minimum standard contract clauses and guidelines for small farmer/agribusiness transactions. It is essential that such proposals be seen as

recommendations, not prescriptions. An important condition for lasting farmer-agribusiness linkages is security of tenure.

Creating a Level Playing Field

The enhancement of competition is another government contribution to improving the institutional environment. It involves all measures to ensure open, fair and transparent competition and to facilitate entry of newcomers. It may include breaking up of monopolies and cartels, ensuring minimum professional standards of business conduct, and resisting demands for non-technical obstacles to official licensing by rent-seeking lobbies. A lack of financial means is frequently the reason that debars newcomers from conducting new businesses. Part of creating an enabling environment would also address the downside of privatization and liberalization. This might include the provision of alternate areas of safety nets and conduit for unsuccessful competitors in view of the regulated markets.

Improving Information

Another way of leveling the playing field in smallholder-business arena is the improvement of information. However, information gathering and their analysis is apparently costly. Compared to commercial business, farmers are at a disadvantage on knowledge about price tendencies, fluctuation, volumes, qualities, alternative marketing channels and other features governing market forces. Governments can improve the communications channels to maintain regularity and flow of quality information to farmers through training, workshops, publications and information technology that improve transparency and facilitate transactions. Governments can also sponsor market-matching exercises, that is, sponsor meetings and workshops involving farmers and agribusiness enterprises to improve mutual understanding of constraints and requirements, and promote concrete business deals.

"HUMAN FACE" OF REFORMS

Moves towards market liberalization have often led to an aggravation of farmers' problems in the short-term. The cushions of input subsidies, subsidized agricultural credit and guaranteed outlets at fixed minimum prices through State marketing boards are no longer available. In some cases market liberalization has increased competition with cheaper products and more efficient producers from elsewhere to create flux, for instance in basic grains. This raises pressures to diversify into new crops and agricultural ventures with better competitive advantages such as dairy, livestock and poultry, fishery and horticulture. Similarly, seasonal credit which was ever available to the mass of small farmers, became more difficult to obtain after closure of many rural financial institutions in the wake of financial restructuring. New forms of rural finance are gradually emerging, built upon principles of viability of the institution and operation, rather than on credit delivery alone. Under them many credit types of the past will cease to be offered. Private traders are either reluctant to provide credit without adequate guarantees, or charge extreme interest rates to cover risks and transaction costs of lending to small farmers.

While a sounder, more sustainable support system for small farmers based on voluntary, market and private sector-driven institutions is gradually taking shape the increasing reduction of government support has led in a substantial decline of input use by small farmers for food production in several developing regions. A return to former levels of seasonal credit and input use will only occur if it is financially viable to both borrower and lender.

Small farmers will in future face an environment increasingly dominated by private enterprise. They will have to emulate, to the extent feasible, the mode of operations of their commercial counterparts, upstream and downstream. They have to form linkages with business enterprises which are shaped to suit the interests of both parties. To do this on an equal footing, farmers have to gain more market weight and bargaining power through collective action, adopt a business-like attitude in conducting their enterprises, and adapt to the requirements of the market phenomenon. This can require difficult adjustments but also offers an opportunity to benefit from the large efficiency gains made by agribusinesses outside the small farm segment.

In India, in the short to medium time-frame, while strategies of realistic cost recoveries, reduction in subsidies are being implemented and fiscal adjustment being affected to divert resources into investments for long-term agricultural growth, the poor may be adversely affected by this transition to a more market-oriented regime. Hence, provisions will be made to ensure that the economically weaker section of producers, laborers and consumers are provided a reasonable safety cover. These envisage:

* *Crop and Livestock Insurance*: Crop insurance scheme will be redesigned with the village *panchayats* as the basic unit of operations and made more effective and comprehensive in terms of farmers and crops
* *Targeted Subsidies*: Direct subsidies targeted towards small, marginal farmers, agricultural laborers, would continue
* *Targeted Public Distribution System* (TPDS) to ensure that the poor have entitlements to subsidized food
* *Minimum Wages Act* for agricultural laborers to be rigorously implemented
* *Food-for-Work Program* to provide employment to the poor and unemployed.

CONCLUSION

Small and marginal farmers account for a major proportion of farm holdings. Indeed, they constitute the backbone of the agriculture sector in most of the developing countries of the Asia-Pacific region. In the past half century, sweeping changes have been brought about in the field of agriculture as a result of technological innovations. In well-endowed regions with irrigation facilities, small farmers have been quick to adopt the seed-fertilizer package and make their small farms economically viable. In fact, they have benefited from the first generation effects of the Green Revolution and are now moving on to diversification of agriculture into high value crops. Their problems are no longer related to production but rather to marketing of surpluses and value addition on the one hand and natural resource management for sustainable production on the other.

In the vast rainfed areas of the region small and marginal farmers still face major constraints in the production process. They suffer from low productivity and instability in yields and are highly risk averse. They are constrained in the production process by lack of access to inputs, technology, credit, and markets. In addition, they must deal with land degradation and poor and inequitable irrigation availability. Their organizational capacity is also poor which further weakens their bargaining position vis-à-vis the better organized service providers and purchasers.

In the growing era of liberalization and globalization where most countries are opening up their economies to market forces, there is need for governments to empower small farmers to take advantage of the opportunities opening up both in the domestic and international markets. Several successful initiatives have been taken across countries in the region. These success stories need to be adapted and replicated wherever possible. Lessons need to be learnt from the individual cases and mainstreamed into country programs and policies. It is clear from the emerging scenario that the group approach and mobilization of farmers into commodity associations is one strategy that helps in the empowerment process. Another strategy that is clearly discernible is to expand the universe of agro-service providers as well as buyers and purchasers of agricultural produce to make the market environment more competitive. In many countries so far, governments have been the sole or major providers of agro-services and in some commodities the major buyers. The role of governments should change to that of enabler, facilitator, coordinator, arbitrator, enforcer, regulator to ensure a transparent and competitive market environment. Experience indicates that in the transition from a protected economy to one governed by market forces, the small and marginal farmers and the landless are most vulnerable and likely to suffer adversely with respect to livelihoods. To protect the vulnerable groups against such eventuality, governments need to build in requisite safety nets and safeguards so that reforms have a “human face”.

REFERENCES

Agricultural Technology Management Agency, Khurda, 2000. *Annual Report 1999-2000*, Orissa.

Biswas, S. K., 1999. “Innovative Agricultural Strategies for Commercialization of Small Farmer Agriculture”, presented during Round Table Discussions on Innovative Agricultural Strategies for Commercializing Small Farmer Agriculture in Asia, 22-25 June 1999, Bangkok.

Department of Agriculture and Cooperation, 2000. *Policy Framework for Agricultural Extension*, Extension Division, Ministry of Agriculture, Government of India.

----------, 2001. *Watersheds at Work-Success Stories of Watershed Programmes*, Rainfed Farming System and Natural Resource Management Division, Ministry of Agriculture, Government of India.

FAO, 1990. *Small Farmer Development in Asia and the Pacific: Some Lessons for Strategy Formulation and Planning*, FAO Economic and Social Development Paper No. 87, Rome.

----------, 2001). Concept paper on "Promoting Input-Output Linkages for Small Farmers", documentation on FAO's Special Programme of Food Security (SPFS).

Pakisama, 2000. "Agricultural Situation in Asia-Pacific and the Philippines", February 2000. Website: http://www.codewan.com.ph/anihan/arrd_today/situationers/agrisitasiaphil.htm.

Sharma, Rita, 1999. *Agricultural Research and Extension Interface – Indian Experience*, *Agricultural Research and Extension Interface in Asia*, APO, Tokyo.

Sharma Rita, S. Swanson Burton and V. V. S. Sadamate, 2001. "Field-Testing New Methodologies for Planning and Implementing Extension Programs: A Comparison of Innovative Extension Projects in India and the United States", paper presented at the AAIEE, Baton Rouge, Louisiana.

Shinghi, P. M., 2001. "Agricultural Marketing", communication dated 20 April 2001, Indian Institute of Management, Ahmedabad, India.

2. MEASURES FOR ENHANCING EFFICIENCY IN THE DELIVERY OF AGRICULTURAL SUPPORT SERVICES IN JAPAN: AGRICULTURAL CREDIT

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HISTORY AND PROSPECTS OF AGRICULTURAL FINANCE POLICY IN JAPAN

History of Agricultural Finance Policy

1. ***Role***
(1) Government's institutional finance serves as the pillar of agricultural finance policy.
(2) Institutional finance developed under close connection with agricultural finance policy.
(3) Along with subsidy program, institutional finance plays an important role in agricultural policy.
(4) Institutional finance mainly consists of Agriculture, Forestry and Fishery Finance Corporation funds, Agricultural Modernization funds and Agricultural Improvement funds.

2. ***Effect***
(1) Contributes to advancement of capital equipment among farmers.
(2) Contributes to expansion of management scale of farmers.
(3) Contribute to environmental improvement of rural areas.
(4) Contribute to expansion of processing and distribution projects in rural areas.

3. ***Problems***
(1) Prioritized financing for farmers with superior administrative skills is not sufficient (increasing the number of part-time farmers).
(2) Resolving debts from excessive investment (increase in investment was limited to management scale and gave rise to excessive investment).
(3) Complication of fund system resulting from addition to institutional finance in response to agricultural promotion policy.

Prospects

The following policies will be implemented in view of the fact that institutional finance will continue to be positioned as the pillar of agricultural policy.

(1) Prioritized financing for persons supporting the rural areas (financing for incorporated organizations).
(2) Fostering of and support for new farmers with superior administrative skills.
(3) Consolidation and streamlining of fund menu for institutional finance (comprehensive fund system that is easy to use).
(4) Streamlining of clerical ministrations for institutional finance (prompt financing response at the counter).
(5) Elasticization of collateral maintenance measures (through utilization of guarantee insurance system).
(6) Strengthening the functions of agricultural cooperatives that support rural financing (strengthening of financial base through merger and other means is essential in preparation for the launch of the payoff system starting in April 2002).

CHANGES IN AGRICULTURAL POLICY AND AGRICULTURAL FINANCE POLICY

1953
Agriculture, Forestry and Fishery Finance Corporation funds

1956
Agricultural improvement funds

1961 Enactment of the Agricultural Basic Law

1961
Agricultural modernization funds
Agricultural credit guarantee system

1996
Agricultural credit guarantee
Insurance system

1967 "Basic Principles of Structural Policy" (decided at departmental meeting of the Ministry of Agriculture, Forestry and Fisheries

* Expansion of scale through transfer of ownership in addition to expansion of scale through lease.
* Clarification of land use classification in rural areas.

1968
Comprehensive fund system

1970 "On Promotion of Comprehensive Agricultural Policy" (accepted by the Cabinet)

* Urgent adjustment of demand and supply to seek a balance of supply and demand on rice.
* Seeking efficient implementation of production for high-demand items such as animal products, vegetables and fruits

1975 "Prospects of Food Problem and Direction of Food Policy" (presented to the Agricultural Policy Committee)

* Maintenance and improvement of self-sufficiency.
* Stable securement of imports and stockpiling for emergency.

1980 "Basic Direction of Agricultural Policy in the 1980's" (submitted to the Agricultural Policy Committee)

* Maintenance and strengthening of comprehensive food self-sufficiency.
* Reorganization of agricultural production in accordance with demand and improvement of productivity.
* Planned improvement of rural areas.
* Improvement of food industry

1981
Regional agricultural reorganization and improvement system

1986 "Basic Direction of Agricultural Policy Towards the 21st Century" (reported by the Agricultural Policy Committee)

* Establishment of productive agricultural structure.
* Reduction of disparity between domestic and foreign prices for farm products.
* Building of dynamic rural community.
* Maximization of vitality for food industry and substantiation of consumer policy.

1990
Between mountain region vitalization fund system

1992 "Direction of New Food, Agriculture and Rural Policy" (announced by the Ministry of Agriculture, Forestry and Fisheries)

1994 "Direction of Development for Agricultural Policy in response to New International Environment"
"Outline of Measures related to Uruguay Round Agricultural Agreement" (decided by Emergency Agricultural and Rural Measures Headquarters)

1994
Comprehensive financing system for fosteirng of management body (super comprehensive financing system)

1995
Special loan for reducing the burden of farm households
Finance system for supporting agricultural employment

1998 "Report from the Inquiry Committee for Basic Problems of Food, Agriculture and Rural Areas" (report from Inquiry Committee)

1999 Enactment of the Basic Law on Food, Agriculture and Rural Areas

* Securing stable supply of food.
* Sustainable development of agriculture.
* Promotion of rural areas.

2001
Comprehensive financing system for utilization of farm management resources

3. COOPERATIVES AND THE DEVELOPMENT OF FARMING GUIDANCE ACTIVITIES

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INTRODUCTION

The agricultural cooperative in Japan has been putting much effort into its farming guidance activity ever since the "reinforcement of agricultural productivity" and the "education for the enhancement of members' technical and managerial skills" have been included in the cooperative's goals under the Agricultural Cooperative Law.

The development of the farming guidance activity can be broadly divided into four periods. The first period was from the creation of the agricultural cooperative system to the emergence of "agricultural complex" concept. The second period started with the agricultural complex up to the commencement of the 15th National Agricultural Cooperative Conference. The third period began with the 15th Conference in which a resolution was passed for the "formulation of regional agriculture promotion plans" and the "strengthening of the system for adjusting the supply and demand of agricultural products". The fourth period is the present.

EVOLUTION OF THE AGRICULTURAL COOPERATIVE FARMING GUIDANCE ACTIVITIES

Formulation of the Agricultural Cooperative Farming Guidance Activities (Period I)

Food shortages and unemployment of agricultural engineers after the war prompted the agricultural cooperative to formulate the farming guidance activity. However, this gave rise to the "Agricultural Cooperative Management Refinement Theory" which called for the abolition of unprofitable divisions such as the processing and guidance divisions. As a result, technical and farming guidance of the agricultural cooperatives were reduced and guidance engineers were transferred to regional agricultural improvement and extension centers and other similar organizations.

It was then that the first collective reorganization issue arose in 1951, with the idea of absorbing the production guidance functions of the agricultural cooperative by the Agricultural Commission. In the government's plan, technical guidance was to be an independent administrative body and the agricultural cooperative was to take on the guidance task as a subcontractor. It also defined the agricultural cooperative as the representative of the farmers and the Agricultural Commission as the representative of agriculture. Effects of this collective reorganization issue centering on who will take initiative of farming guidance lasted until the beginning of the 1960s.

From 1957, the branch agricultural cooperatives actively promoted a "three-year reformation and expansion plan" which aimed at establishing a "farming guidance self-maintaining principle" reflecting the limitations of past farming guidance that was based on the agricultural cooperative management refinement theory. It defined the goals of farming guidance as improvement of farmers' incomes and the advancement of the agricultural cooperative, and put forth the farming guidance service theory" as the main principle of the agricultural cooperative's farming guidance activities. The plan particularly focused on the planning of farmers' economies under the following three main ideas: (1) establishment of a farm management plan in

each household; (2) creation of an agricultural counseling center within the agricultural cooperative in order to provide consistent technical guidance; and (3) fostering of small village associations.

Against a backdrop of declining agricultural productivity relative to industrial sectors, the "Agricultural Cooperative Structural Improvement Plan" was introduced in 1960. In this plan, (1) establishment of regional farming improvement goals and (2) formulation and promotion of a regional farming guidance improvement plan were identified as key measures, switching its major focus from individual farmers to farmers' groups in the region.

This change reflected the difficulties of providing farming guidance to individual farmers, the expansion of farming scale for mass production, and the necessity for developing commodity-specific farmers' organizations, in the midst of expanding demand and technological innovations. It was also from the precise environment that the "agricultural complex" concept was formed.

Preparation and Development of Agricultural Complexes (Period II)

The formation of "agricultural complex" was seen as the main pillar of the agricultural cooperative's farming guidance activities. Farming guidance within the agricultural complex was to be integrated with the agricultural cooperative's activities.

By having farmers work collectively and by creating a consistent system of production, distribution, and shipping for each crop, the agricultural complex in fact acted as a major farming estate and streamlined distribution process. In this way it aimed to gain an advantageous position in the market, increase farmers' incomes and improve the management of the agricultural cooperative.

At the same time, the country also promoted the development of agricultural productivity and the selected expansion of livestock products, fruit trees, and other high value crops. The strengthening of the agricultural cooperative's farming guidance and other national measures combined to help agriculture make significant headway.

However, as rapid economic growth gave way to stable growth following the oil shock of 1973, overproduction and stagnant prices of agricultural products became apparent. Selective crop expansion reached its peak, and some agricultural complexes gradually lost momentum. Agricultural complexes were forced to switch from pursuing simple scale merit to achieving total merit.

The agricultural cooperative reviewed the actual conditions of agricultural complexes and included regional integration into its farming guidance activities to develop an agricultural structure that could cope with the changing state of affairs. The livestock complex system started in 1949 expanded to over 600 complexes throughout the country, and served as the core of livestock activities in terms of both quality and quantity.

Introduction of the Regional Agriculture Promotion Plan and Strengthening of the Supply-Demand Adjustment Mechanism (Period III)

At the 15th National Agricultural Cooperative Conference held in 1979, agricultural cooperatives agreed to formulate a regional agriculture promotion plan and strengthen the supply-demand adjustment mechanism. Oversupply of major farm products and trade liberalization trend necessitated such changes with long-term perspectives.

The regional agriculture promotion plan aimed to tackle agriculture issues by integrating all regional efforts. All nationwide cooperatives were required to act as one in formulating and implementing an integrated national production and marketing plan, and to strengthen their own supply-demand adjustment mechanism with a focus on their main products. In these ways the agricultural cooperative aimed to make agriculture more demand-driven.

The 16th Conference was held amid a serious crisis. Worsening oversupply and profitability led to the formation of more active bodies for structural reforms. Formulation of an "agricultural land use plan" was recommended to strengthen the regional agriculture promotion plan. In this plan, the cooperatives resolved to create a "regional farming group" to reduce costs of grain sectors.

The 17th Conference was held in 1985 under the theme, "agriculture and farm village promotion policies in the latter half of the 1980s" and agreed to continue qualitative enhancement of the regional agriculture promotion plan. Specifically, it recommended: new developments in regional farming groups including livestock and horticulture; adjustment of land use and better utilization of production resources;

reducing cost; promotion of processed products from local specialties; and implementation of the national production and marketing plan. Further, the agricultural cooperative aimed to establish a system of farming guidance by strengthening the following: (1) comprehensive planning and management for promoting regional agriculture; (2) coordinating and adjusting the utilization of labor, production resources, etc.; (3) development and dissemination of new production technology; (4) economic counseling and guidance; and (5) collection, analysis and provision of information.

AGRICULTURE PROMOTION UNDER THE "FOOD, AGRICULTURE AND RURAL VILLAGE" BASIC LAW

The Agriculture Basic Law, which has been in effect for 40 years since 1961, has been changed to the "Food, Agriculture and Rural Village" Basic Law in 2000. The Basic Law of the 1960s was created when trade liberalization of agricultural products started, while the new basic law was enacted when all remaining trade restrictions were lifted and tarified. During this period, Japan's rate of self-sufficiency of food fell from 70 to 30 percent, the number of farming households decreased from 6.06 million to 3.2 million, people engaged in agriculture decreased from 12 million to 3.08 million, and the share in GNP dropped from 9 to less than 1 percent. Considering that sustainability of agriculture is at risk the new Agriculture Basic Law places priority on the improvement of self-sufficiency of food, aiming to exceed 40 percent. The next priority lies in the support of farmers having capacity and wills.

Based on such government policies, the agricultural cooperative sets forth its own course of action. The following approaches were determined at the 22nd National Agricultural Cooperative Conference held in October 2000:

* With self-sufficiency of food as the number one priority, each agricultural cooperative will formulate and carry out its own regional agriculture promotion plan.
* In order to preserve agriculture, it will secure and foster not only full-time farmers but also other helping hands and groups including part-time farmers, women, and elderly people.
* Farming communities that comprise an entire rural village should be regarded as one farm, so that effective use can be made of land, people, machines and facilities in that region, thereby reducing production costs.
* An effort will be made to promote effective land use by preventing agricultural land to lie idle or be abandoned.
* Production adjustment volume will be achieved switching to crops other than rice, such as wheat and soybean, and participating in the direct payment system of the government.
* Opportunities for direct sales of agricultural products will be expanded through promoting a Japanese style diet and by interacting with consumers and city people.

AGRICULTURE PROMOTION AND FARMING GUIDANCE AT INDIVIDUAL AGRICULTURAL COOPERATIVES

Individual Agriculture Promotion Plans

The agriculture promotion plan of each agricultural cooperative is based on the policies of the national agricultural cooperative, but is formulated by each cooperative, taking into consideration regional characteristics. The cooperative normally prepares a draft, to be deliberated by each village and then finalized at the general meeting.

Since the 1980s, each agricultural cooperative has been a basic plan that covers more than three years, and manages its affairs based on various long-term plans including credit, insurance and economic activities, to management plans and daily living activities. Farming plans are also developed at the same time as a part of the basic plan. However, farming plans are usually drafted in a detailed, mid-range perspective, as part of the agriculture promotion plan, and outline the common nationwide goal, as well as specific goals. The annual farming activity plan is formed based on these goals. Each farmer sets out to achieve his managerial goals based on this activity plan.

Farming Guidance System

1. ***Placement of Farming Advisors***

Farming guidance is one of the most important activities of the agricultural cooperative. It is closely connected to all other activities such as collective purchasing and sales, insurance and credit activities. Farming guidance includes technical guidance, selection of production materials, marketing, management, and planning. Depending on agricultural cooperatives, these guidances may be provided by one division, but normally they are grouped into two or three divisions. Because technical knowledge and skills are required, the division normally has specialists with the title of "farming advisor". The farming advisors visit farmers and provide guidance as demanded. Their specialties range from the obvious rice and wheat, to vegetables, fruit trees, flowers, and stock. Each farming advisor visits around the farming households in his territory and provides guidance.

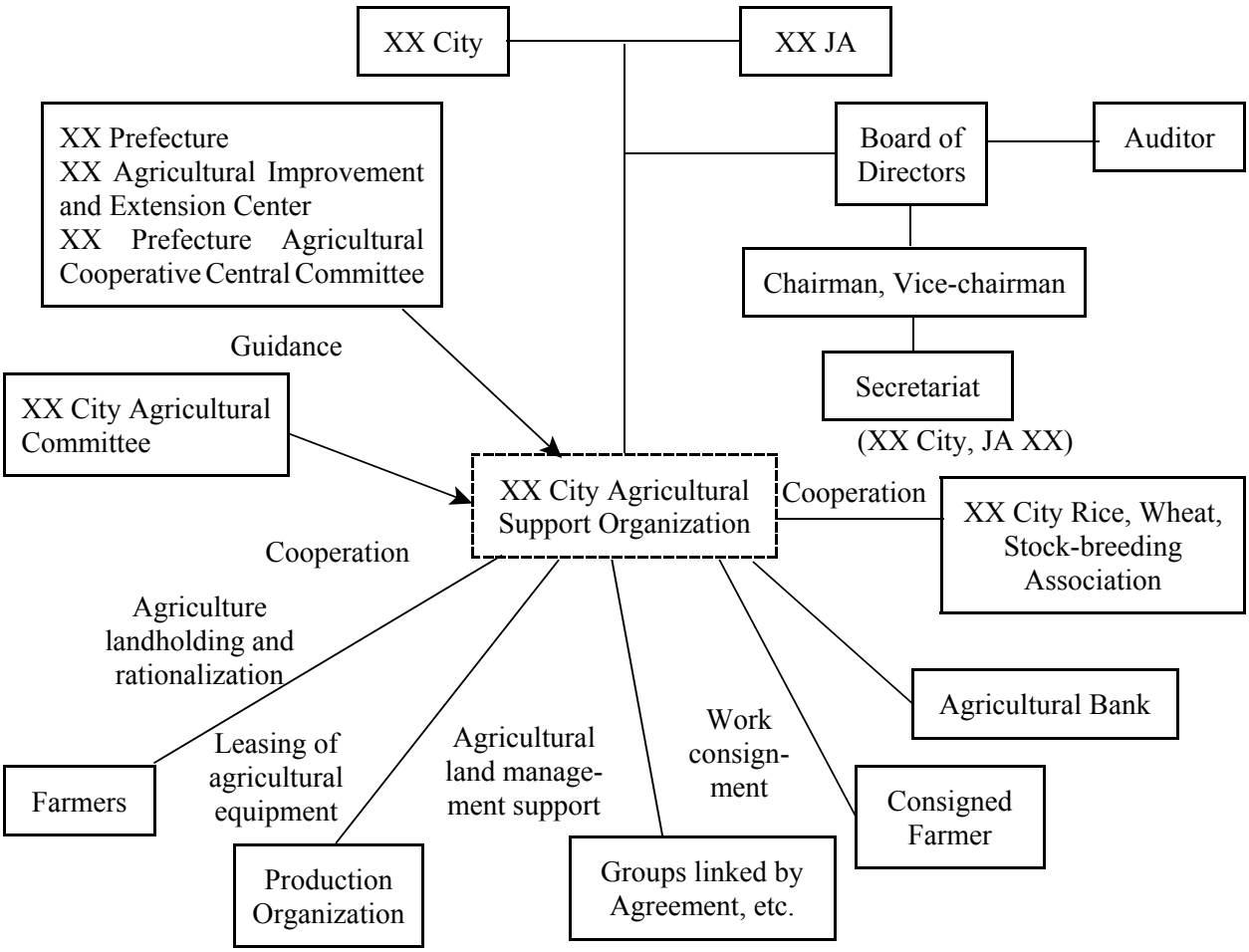
The expense of the farming advisors is partly paid by the farming households, but in actuality, as this is far from sufficient, the cooperatives supplement the deficiency. Most agricultural cooperatives view the farming guidance unit as a service-oriented one. Being a deficit-ridden unit, its size has been scaled down in the course of recent mergers and cost reduction efforts.

2. ***Sections and Organization***

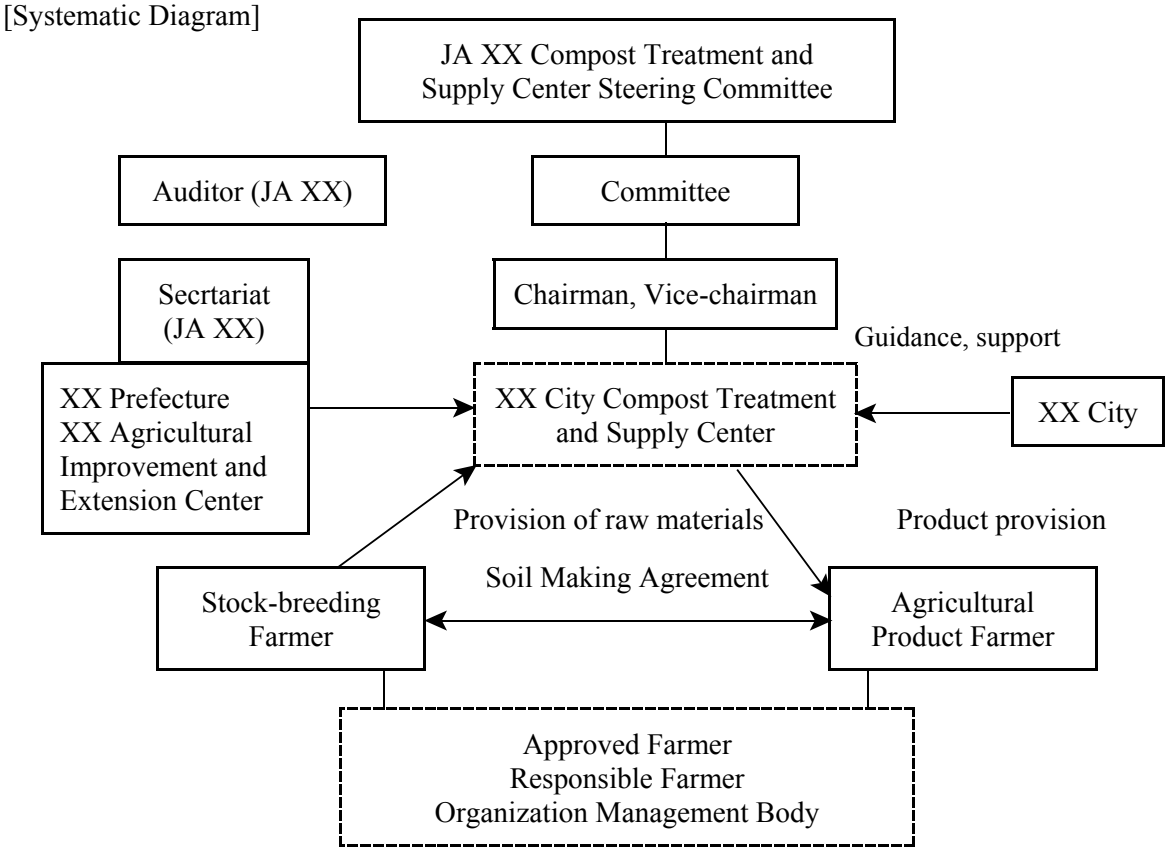
Within the farming division are smaller sections that provide technical guidance on rice and wheat, animal husbandry, horticulture and flowers, and are each placed within the main office or branch offices. The production materials section, which handles agricultural machinery, fertilizers and agricultural chemicals, is often called "farming center" and set up often together with country elevators and collecting and shipping facilities.

The job of technical advisors is to visit farming households, provide guidance on disease and pest prevention, better use of fertilizer and to help make better marketing. However, they are increasingly being asked to work as a all-round advisor covering managerial planning, cooperation for set-aside, selection of crop rotations and organizational matters of farming households. Also regional farmland use planning, mediation of land sales or rent, mediation in commissioning (agricultural machineries) are included in the activities of the farming division. Adjusting rice production and providing a guidance on crop rotations in particular are increasing in importance. Yet, substantial part of the farming division's work today is the paperwork associated with government policies.

Concerning the sales of agricultural products, a production section usually exists for each agricultural product, which manages collecting and shipping independently. These sections are usually supported by the agricultural cooperative or town administration. Shipping of agricultural products by the agricultural cooperative is, in principle, commissioned.



[Systematic Diagram]



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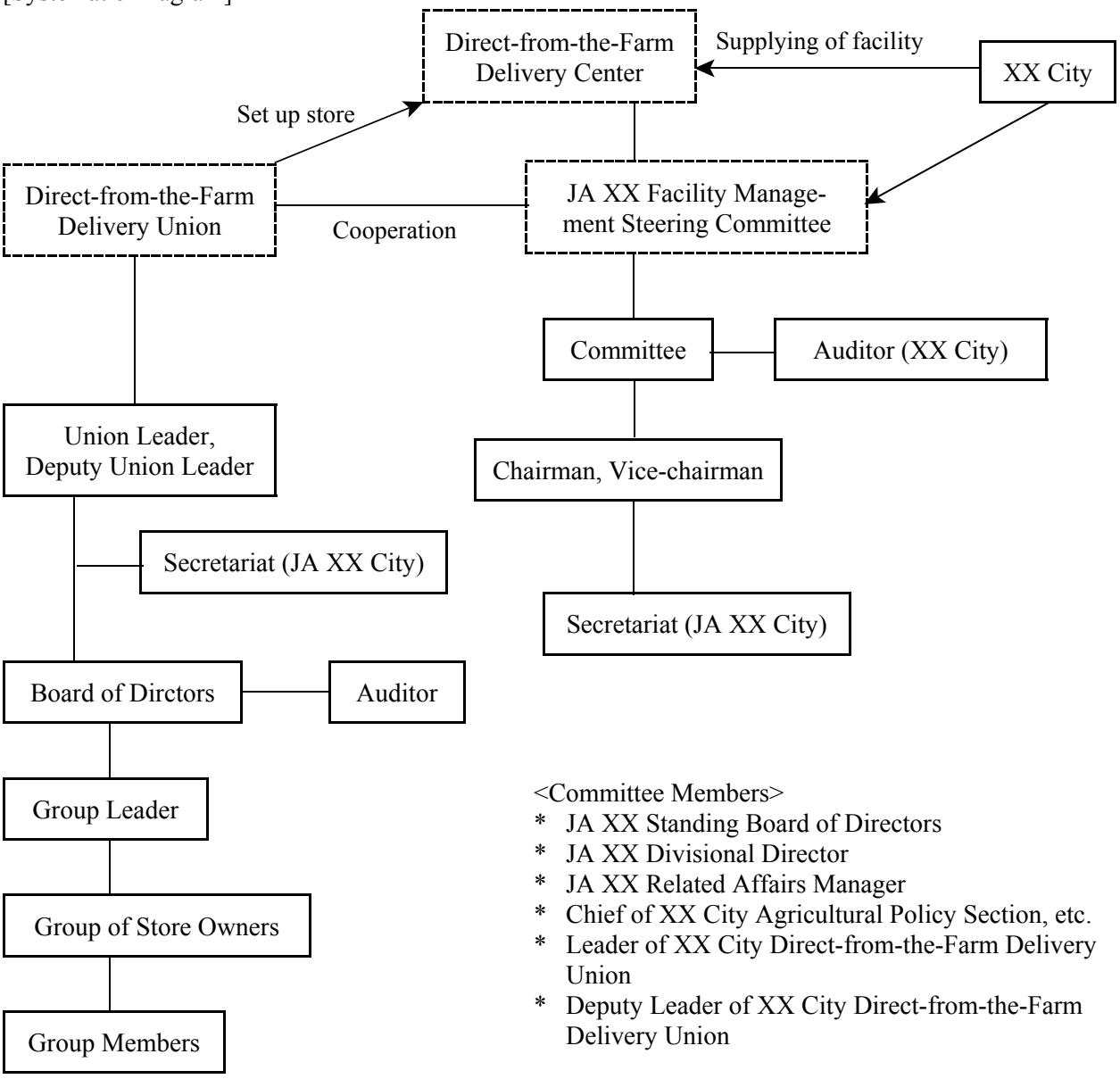

<Committee Members>

* JA XX Standing Board of Directors
* JA XX Divisional Director
* JA XX Related Affairs Manager
* Chief of XX City Agricultural Policy Section, etc.
* Leader of XX City Direct-from-the-Farm Delivery Union
* Deputy Leader of XX City Direct-from-the-Farm Delivery Union

4. MEASURES FOR ENHANCING EFFICIENCY IN THE DELIVERY OF AGRICULTURAL SUPPORT SERVICES IN JAPAN: RESEARCH AND EXTENSION

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INTRODUCTION

Agricultural Extension Service in Japan

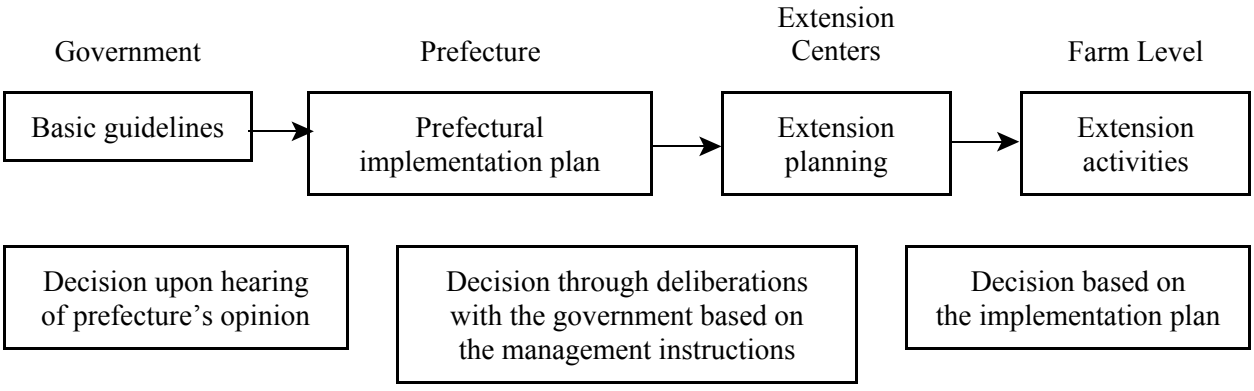
The basic role and operations of Japan's agricultural extension service is stipulated by the State law. However, the service is implemented in the form of cooperation projects by the prefectural governments and the central government. Each prefecture has subject matter specialists and extension advisors in its administration system. One of the most important role of them is to create a link between the research at the experiment institutes and the farmers.

Cooperative Work by National and Prefectural Governments

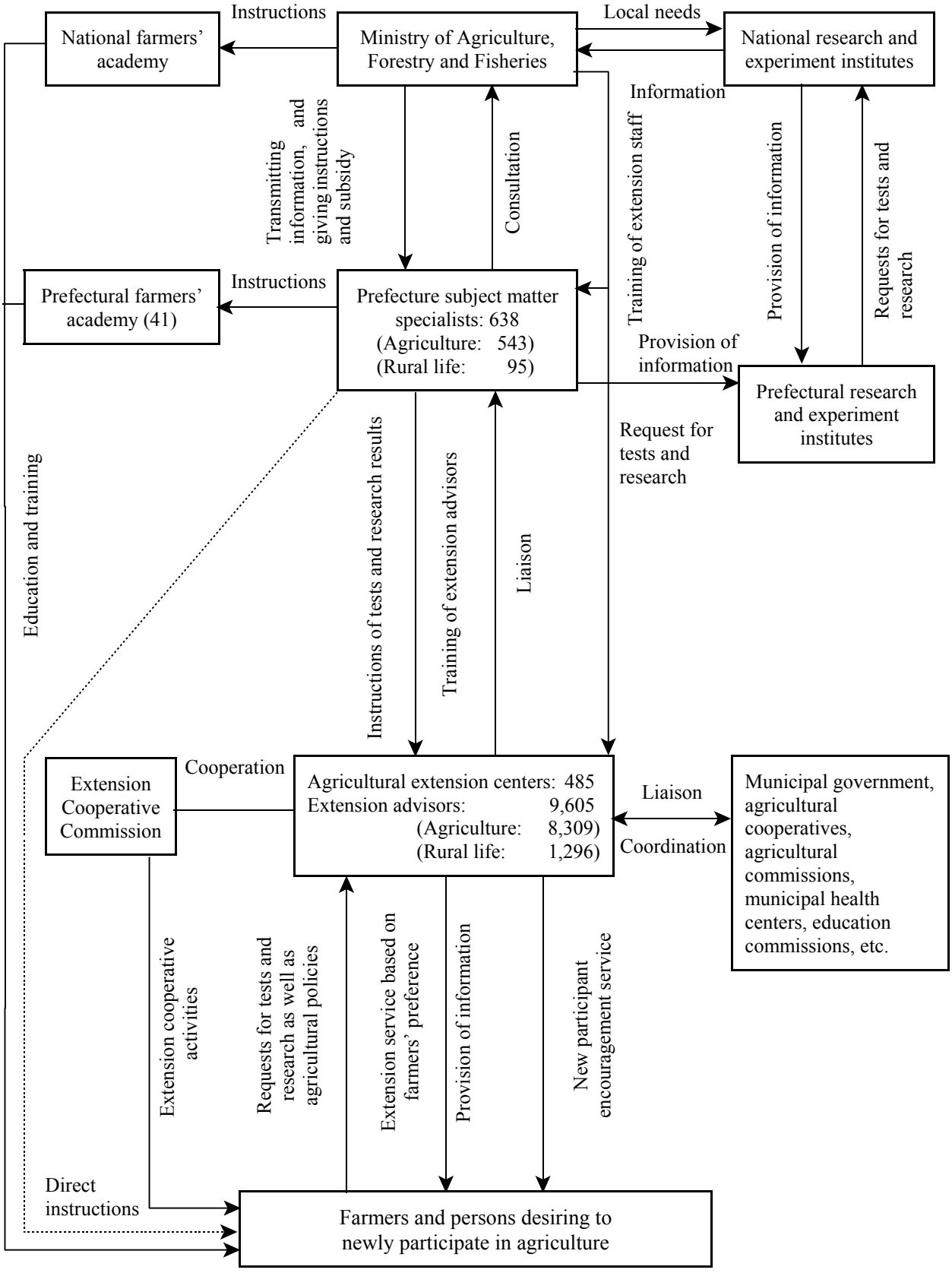
Agricultural extension system in Japan has the objectives at the government level, it is to ensure the national food security at a prefecture level, to promote regional agriculture and enhance the welfare of rural villages. To improve national agricultural productivity, it is crucial to share technologies and knowledge among various actors working at various levels or at different localities.

In the Agricultural Improvement Promotion Law, the framework of the agricultural extension service is based upon joint work (work sharing, joint responsibility) between the prefectures and the government. The following rules apply:

1) The system is operated based on the discussion and decisions made between national and prefectural government.



2) The extension staff (extension advisors as well as subject matter specialists) holding the prescribed qualifications are assigned to work in the regional agriculture improvement and extension centers established in every prefecture.

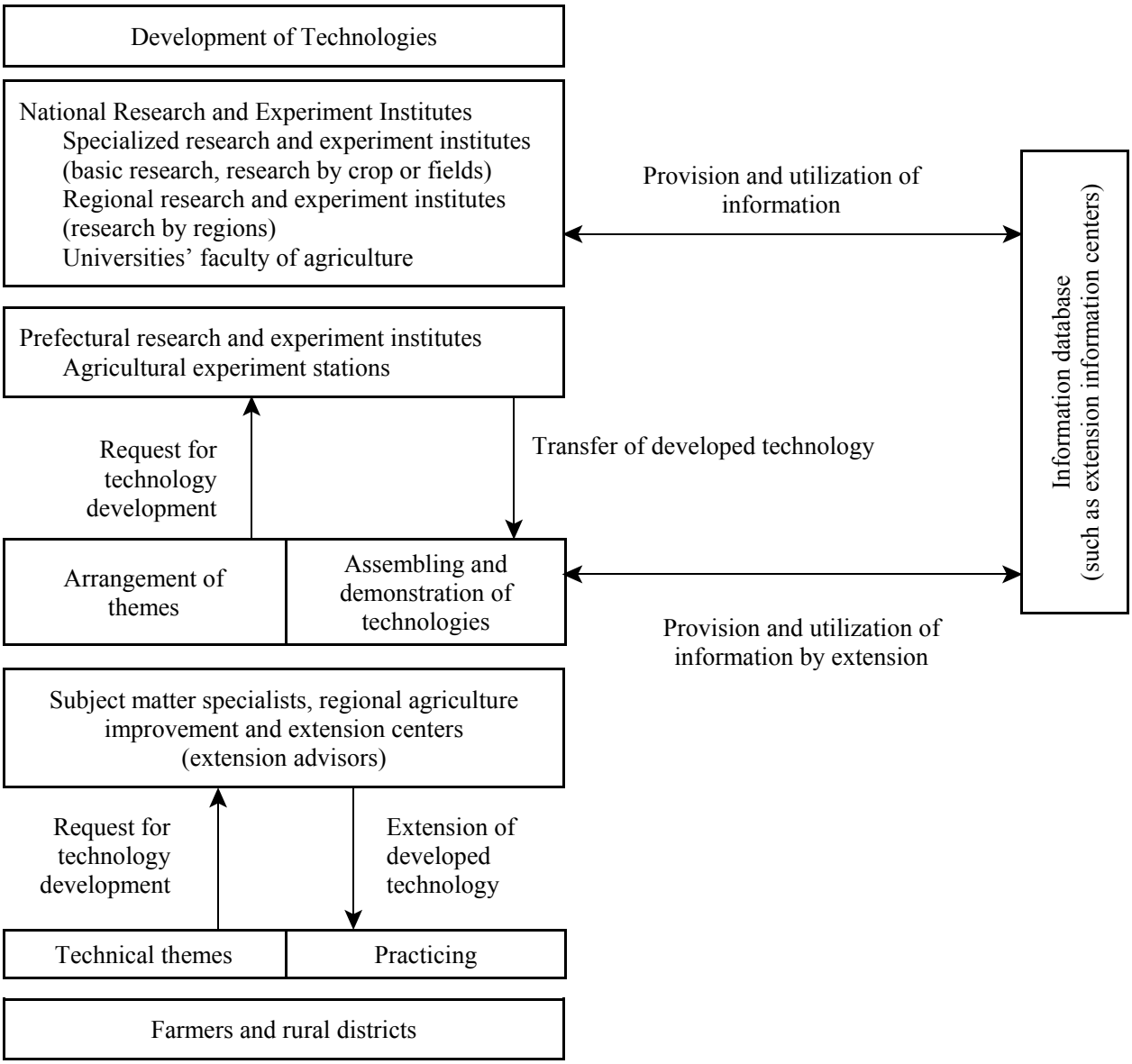


Agricultural Extension Service System in Japan

Extension Advisors Linking Researchers and Farmers

The agricultural extension service enables subject matter specialists to feedback the requirements of the local farmers to the experiment stations while technologies developed and tested at these research institutes are disseminated to the farmers through local field demonstrations.

(Reference) Flow of Development and Extension of Technologies in Agricultural Fields



Improving Technical and Management Skills by Working Together

Agricultural extension service aims at farmers to improve their technical and management skills through:

1) dispatching extension advisors with technical expertise to the regional agricultural extension centers in every region of the country;
2) establishing relationships of trust between farmers and extension advisors;
3) assisting transfer of technologies through local level demonstrations and exhibitions and by establishing direct relationships with the farmers, in their region; and
4) providing information concerning business management methods and agricultural technologies.

The agricultural extension service described above implements a very detailed technical and management assistance that no other general administrative institution or examination and research facilities can provide. It tries to help farmers to solve local issues in a practical manner by working together with farmers.

Agricultural Extension Service Handles Both Agriculture and Quality of Life Issues in a Manner

Agricultural production and rural communities are intimately linked. This is why it is necessary to improve simultaneously the "production" and the "life" aspects, which must be considered as two facets of the same coin, if one wants to establish a useful agricultural management system and make agriculture an attractive career.

In Japan, most of the agricultural businesses are family businesses and the work load often goes to all family members including women and elderly. In order to improve the situation agricultural extension workers are working not only for technical matters but also for family members' welfare including the participation of women in agricultural management, their working hours, their working conditions and their free time.

OUTLINE OF THE AGRICULTURAL EXTENSION SERVICE

Specialized technical staff of the agricultural extension service, extension advisors and subject matter specialists are sent to every prefecture. The strength of the extension system is the regional agricultural improvement and extension center (extension center) established in every prefecture.

Extension Advisors

Extension advisors belong to the respective extension centers. As they are in permanent and close contact with the farmers, they are involved in activities (extension and instruction activities) such as consultations on technologies and management, providing information, organizing regional exhibitions, and organizing trainings and seminars, etc.

1. ***Recruitment of Extension Advisor***

Extension advisors are recruited from individuals having passed the qualification examination implemented by the prefectures which target holders of an undergraduate degree, and who have passed successfully the prefecture's recruitment examination. Moreover, after their recruitment, they will receive a training and measures will be taken to ensure that they improve their general instructing abilities, in order to enable them to be sent into office in the diffusion extension centers for a relatively long period, and so that they are able to disseminate knowledge in the manner most appropriate to their area.

2. ***Activities of the Extension Advisors***

The extension and instruction activities of the extension advisors are implemented by dispatching one extension advisor for each specialty field in every extension center established in the jurisdiction of the designated area. They are dispatched according to the following criteria:

a) Each area of jurisdiction is divided into several activities areas and extension advisors perform activities by creating teams for each activity area (organization by area).
b) Activities are performed by targeting the area of jurisdiction as a whole and extension advisors organize the number of teams corresponding to the number of specialty fields (organization by specialty).
c) Activities are organized by simultaneously using both methods described above (synthesis of the two).

Subject Matter Specialists

Subject matter specialists provide instruction to extension advisors who organize activities locally. They study the methods and skills required. They keep in close contact with the research and experiment institutes. They visit from time to time the prefectures' headquarters and the prefecture research and experiment institutes.

1. ***Recruitment of Subject Matter Specialists***

Subject matter specialists are responsible for specific expertise such as agricultural management, vegetable growing and rice farming. They are recruited from researchers, and extension advisors who have passed the technical expertise qualification examination conducted by the government.

2. ***Activities of Subject Matter Specialists***

a) Establishing the basic plan for extension and guidance activities within the prefectures in conformity with the management plan decided by the government, and providing advice for each extension center.
b) Guidance to the extension advisors: They plan and implement surveys about the extension advisors in the examination centers. They assist extension advisors while surveying places such as research and experiment institutes.
c) Investigation studies: They study the issues and problems of agriculture-related technology and management.
d) Cooperation with the research and experiment institutes.

Regional Agricultural Improvement and Extension Centers

Regional extension centers perform the following activities:

1) Deciding and planning activities in conformity with the government guideline as well as with the prefectures' implementation plan.
2) Assuring mutual contact among extension advisors and deciding the organization of activities and the creation of teams for the extension and instruction work.
3) Establishing cooperation with agricultural groups, municipalities of the area of jurisdiction, etc.
4) Consulting, collecting and providing information related to newly-established farmers and about the improvement of agricultural management and of the quality of life of rural villages.
5) Surveying and analyzing the scientific data necessary to the extension and instruction activities.

In order to carry out the above-mentioned activities, extension centers do not only provide an office for its staff but also provide a research laboratory, as well as the equipment for soil and management diagnosis. Activities aiming at planning the promotion of the region's production and rural villages are also implemented by opening the centers to local residents. Activities led by extension advisors, which consist in providing information related to newly-established farmers and to the diagnosis of agricultural management, are also undertaken.

(Reference) Conditions of Activities by Extension Advisors

1. Number of farmers per extension advisor

Farming Family Number (families)		Basic Number of Farming Workers (persons)		Surface of Cultivated Land Managed (ha)	
Total	Commercial Farming	Total	Commercial Farming	Total	Commercial Farming
359	276	289	267	429	413

Source: Rural Census for 1995 (fixed values).

Note: The number of extension advisors is calculated by using the figure of 9,605 extension advisors as of 1 April 2000.

2. Number of hours of activities per month and per extension advisor (unit = hours)

Number of Hours of Instruction in the Area				Office work, Meetings and Conferences for the Center's Internal Management	Training	Others	Total
Local Instruction	Instruction Preparation	Cooperation with Related Institutions and Groups	Sub-total				
56.4 (35.3)	49.8 (31.2)	20.2 (12.7)	126.4 (79.2)	17.8 (11.1)	9.7 (6.1)	5.8 (3.6)	159.7 (100.0)

Note: The figures in parenthesis are composed ratios in percent.

3. Number of trainings, seminars, etc. per first grade extension center (unit = time)

Trainings-Seminars	Roundtable Talks	Exchanges-Announcements	Others	Total
353	122	40	72	587

Source: Report about the contents of the extension advisors diffusion extension and instruction activities, 1998.

<Examples of Main Methods of Activities>

*** Assistance to the Establishment of a Growing Area and of Agricultural Production Technologies**

1) Introduction and extension of technologies fitting the local conditions and the environment.
2) Guidance about how to treat soils through soil diagnosis and about how to diagnose the growing of crops based on weather conditions.
3) Study and advice crop rotations and diversification towards locally appropriate crops.
4) Assistance for processing of agricultural produce, and for marketing and business management through the arrangement for extension cooperation committee members (technical experts).
5) Advice on the work sharing by farmers in order to reduce the peak load during the high season.

*** Advice for Agricultural Management Improvement**

1) Improvement of working conditions: management diagnosis and analysis based on register instructions and register results such as working records, bookkeeping, etc.
2) Establishing corporate management: planning and monitoring of management improvement goals, creation of a trial balance sheet between income and worked hours when introducing scale enlargement and new crops.
3) Technologies and management improvement: loan plans, repayment schemes, purchase advice.
4) Empowerment of women: demonstration of women's ability in agricultural management, promotion of family management, agreements fixing mutual rules between family members about the working conditions.
5) Use of computers in business management.

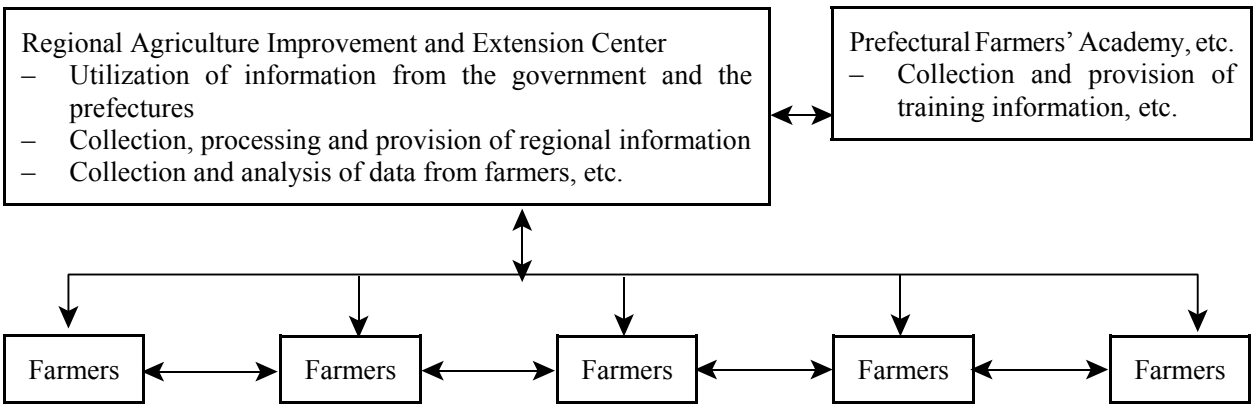
*** Assistance to Villages and Agricultural Production System**

1) Group activities of the village youth: 4H clubs, consultation with young farmers, advice for newly-established farmers.
2) Cost reduction: operation and maintenance of structures and advice for reducing costs and preventing excessive investments in management.
3) Promotions of regional activities: developing processed merchandises using local resources, cultural exchanges between residents of rural villages and residents of urban areas.
4) Improvement of the village environment: cleaning, village drainage systems, waste management.
5) Advice to women who intend to start agricultural businesses.

CREATION OF AN EXTENSION INFORMATION NETWORK

An extension information network is created, which links the government, the prefectures, and the extension centers, and which helps implement extension activities in a more efficient and effective way, and is designed to provide rapidly information related to any type of farming. A network linking the extension centers and the farmers is also established, which enables diagnosis analysis of management using information processing technologies. It also allows quick provision of information to the farmers.

(Reference) Outline of the Diffusion Information Network



– Utilization of information from the government, the prefectures and the extension centers
– Provision of local themes
– Exchange of information among farmers.

OUTLINE OF THE PREFECTURAL FARMERS' ACADEMY

The farmers training and education institutions "farmers academy" established by the prefectures conduct training and education based on modern knowledge and skills related to business management methods, and on the advanced agricultural technologies. Farmers' academies target those who will be in charge of agricultural businesses as a successor of existing farm, as well as those who wish to become new farmers.

Its main activity is training through its "boarding school" system. There is also a short-course training for new farmers just changing careers. It also offers an advanced training of two years targeting the graduates of above-mentioned
trainings.

(Reference) Outline of Farmers' Academies

1) Long-course agricultural training and education
   * Required level of education: high school graduate and any similar or higher level of education
   * Duration of the course: two years in principle
2) Advanced agricultural training and education about topics such as management ability training
   * Required level of education: graduated from the training department or from junior college
   * Duration of the course: one or two years
3) Short-course farming training and education
   * Targeted individuals: farmers, etc.
   * Duration of the course: one year maximum.

1. BANGLADESH

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INTRODUCTION

Human civilization on earth started progressing with the introduction of agriculture and even today despite grand strides made by science and technology cannot be ignored because "To live means eating food which is mainly the outcome of agriculture".

The extent of support services for farmers during the last decade in Bangladesh has proved efficacious and development of the agriculture sector is now considered satisfactory in the national context. The country is now self-sufficient in food production, and food security can be ensured. The small farmers who are the main actors in national food production, however, still confront many inherent problems which need to be addressed.

The Government of Bangladesh approved the National Agriculture Policy, Seed Policy and Fertilizer Subsidy through which all farmers, especially small farmers are expected to benefit significantly.

Bangladesh agriculture is losing cultivated farmland to urbanization, river erosion, building of physical infrastructure and human settlement, at an alarming rate. The recently published 1996 Agricultural Census Report reveals that the country has lost about one million ha of arable land over the 12-year period between 1983-84 and 1996.

As the number of farm holdings increased by 17.5 percent, the above loss of arable land meant a serious reduction of average farm size from 0.81 to 0.61 ha during the same period. What is more noteworthy is that while the number of medium and large farms decreased by 16 and 40 percent, respectively, the number of small and marginal farmers increased by 33 percent. The number of absolutely landless and agricultural labor households also increased by 52 and 17 percent, respectively. Given the declining availability of land it has become extremely important to focus on the enhancement of agricultural productivity, so that not only the per capita availability of food could be increased but also land could be released for cultivation of non-food crops.

Table 1. Changes in Number and Structure of Farm Holdings in Bangladesh

Parameter	1983-84	1996	Change (percent)
Total holding (000 ha)	13,818	17,828	+29.0
Farm holding	10,045	11,798	+17.5
Small farm	7,066	9,423	+33.4
Medium farm	2,483	2,078	-16.3
Large farm	496	297	-40.1
Total non-farm holding	3,772	6,030	+59.9
Absolute landless (000)	1,198	1,815	+51.5
Agriculture labor household (000)	5,495	6,401	+16.5
Area cultivated (000 ha)	8,158	7,192	-11.8
Average farm size (ha)	0.81	0.61	-24.7
Per capita cultivated area (ha)	0.10	0.06	-40.0

The above figures show that small farmers (about 80 percent in 1996) are increasing while big and medium farmers are decreasing in number. More credit is required to be directed to the agriculture sector. Farmers with access to credit use improved farming technologies. Most agricultural credit schemes failed in the 1970s and 1980s because traditional banking approaches were used. This left small land holders and tenant farmers without credit to finance their operations. New institutions providing credit to agriculture are necessary in order to ensure greater impact on poverty, because agriculture in Bangladesh, like in most developing countries, continues to be the engine of economic growth and employment generation.

Rural Finance

The World Bank study titled "*Bangladesh Rural Finance*" (Report 15484-ED, 28 June 1996) has drawn attention to the fact that rural financial markets in Bangladesh are fragmented and inadequate to meet the demand for financial services. The public sector institutions are unsustainable and have limited outreach. The Member-based Institutions (MBIs) that target one section of the rural population do not in general address the problem of finance in agriculture. They provide limited range of services, most notably they cannot accept voluntary deposits for prudential reasons, making them unable to intermediate effectively. Further, most of them cannot function without subsidy. The informal sector, while providing much needed services is unlikely to be able to support a major growth initiative by itself. The rural financial market remains segmented and constrained for resources. The primary objective of the rural financial sector reforms should be to create a strong and efficient system of financial intermediation. To develop such a system, important policy and institutional reforms including creation of new institutions are necessary.

Credit Need

Intensification and diversification of agriculture will obviously call for increased demand for capital. Since 80 percent of the population of Bangladesh lives in rural areas and over half of this live below the poverty line, optimum investment in agriculture is beyond their financial capability. Scarce resources and seasonality of agriculture make timely and adequate availability of credit a major constraint for small farmers. Lack of banking facilities force households to rely on inefficient and costly alternatives. Inadequate access to medium- and long-term finance inhibits investments by a majority of small and marginal agricultural households in Bangladesh.

In view of the subsistence nature of Bangladesh agriculture and poor capacity of majority of farmers in terms of cash investment, credit has an important role to play in the national efforts for increasing agricultural production. Introduction of package technology (MV seeds, fertilizer, pesticides and water) to achieve self-sufficiency in food grain calls for increased agricultural financing.

This is further evident from the fact that modern high input-based production technology requires larger amount of cash investment which is beyond that reach of majority of farmers of the country. The available data on cost and return of irrigated rice and wheat from 1978-79 through 1991-92 as reported by the Agro-economic Research Unit of the Ministry of Agriculture (MOA) indicate that, for both crops the cost of production more than doubled during the period. In 1978-79, the per acre cost of production of high-yielding variety (HYV) *Boro* was Tk.4,057 which increased to Tk.9,682 in 1991-92. Compared to this, the return from rice and wheat is not significant. The estimated cost and return rate of *Boro* HYV rice per maund has increased from 1:0.89 in 1983-84 to 1:1.09 in 1991-92. Similarly for wheat the estimated cost and return rate per maund was 1:1.45 in 1983-84 which decreased to 1:0.79 in 1990-91. Hence, with the adoption of high productivity farming coupled with policies subsidy reduction, provision of agricultural credit has become all the more necessary.

Absence of an appropriate rural financial system is a serious constraint to agricultural growth and diversification. In the past few decades, two agricultural banks and several public commercial banks have been providing credit to farmers. The performance of the public sector institutions in rural finance is not very satisfactory. This is clearly evident from the extent of loan disbursement during the period 1986-87 to 1995-96. Agricultural credit disbursement was set at Tk.1,416,995.9 million. Against this, actual disbursement was only to the tune of Tk.91,228.3 million, i.e., 62 percent of the targeted program. This reflects a dismal picture of agricultural credit distribution. This is also reflected in the number of passbooks issued and the total number of borrowers in 1995-96. During this period, 8,888,093 passbooks were issued while the number of borrowers was 8,650,789. This implies that a total number of 237,304 farmers who were issued passbooks

did not receive agricultural credit. However, disbursement has increased over the past five years reaching Tk.14,816.3 million in 1995-96. Of this, over 47 percent was for crop loans. Bangladesh Krishi Bank (BKB) and RKUB were the two leading banks contributing about 65 percent of the total disbursements to the sector. As for loan recovery, during the last 10 years Tk.85,162.1 million was recovered. It signifies a recovery rate of 93 percent. This high recovery rate is for the current loans while overdue loans remain to be recovered. The total overdue figure for the period 1986-87 to 1995-96 is Tk.341,280.4 million. Despite some increase in credit flow, institutional sources provide only 8-24 percent of the credit needs of the rural population and the share of agricultural credit never exceeded 15 percent of the total credit disbursement in any year.

Approach to the Creation of New Institution

Following intensive dialogue between the MOA and Association of Development Agencies in Bangladesh (ADAB), the latter submitted a report to the MOA as a follow-up decision of a MOA-ADAB joint meeting for collaboration between MOA and the NGOs working for sustainable agricultural development. ADAB report highlighted the need for crop loan for small and marginal farmers. The report mentioned that the MOA will make Tk.3 billion available to any of the public scheduled banks. The specified bank with the concurrence of ADAB will distribute credit to those NGOs who are members of ADAB, Credit and Development Forum (CDF) and NGO Forum. Only those NGOs will be entitled to receive credit who have 2,000 members and a record of 95 percent credit recovery. They must have experience in the management of credit program for at least three years. The beneficiaries of the credit program as indicated by ADAB will be those who have a cultivable land of 1.5 acres or less. They would be members of groups organized by the NGOs. The beneficiaries would not be required to provide any collateral for this kind of credit facilities. The credit will be used exclusively for the purchase of agricultural inputs and for taking land on lease. The credit amount will vary depending on the kind of crops. Quantum of credit will range from Tk.125 billion to Tk.460 billion. Credit would have to be repaid to the NGOs within three years. The NGOs would take full responsibility of the credit provided to its clients. They would charge a reasonable rate of interest from their beneficiaries. NGOs, in turn will pay 4 percent interest to the concerned bank for the credit fund provided to them.

Thus, it is evident from the ADAB report that the MOA will serve as the source of fund while the main functionaries of the credit fund will be ADAB and its partner NGOs. Comments on the ADAB report were sought from various concerned organizations. Only the Banking Division of the Ministry of Finance and the Bangladesh Bank made their comments available to the MOA. The Banking Division in their comments put forward arguments in support of providing more fund to BKB and RKUB for supplying crop loans to small and marginal farmers. They appreciated the existing mechanism of BKB and opined that no additional manpower will be needed to meet the credit needs of the small and marginal farmers. The Bangladesh Bank also highlighted some of the limitations of the ADAB report and put forward certain recommendations such as (a) pilot program in selected areas by identified NGOs may be taken up before launching a large-scale credit program as envisaged in the ADAB report; (b) credit for off-farm activities may also be considered because farmers together with farm activities also undertake off-farm activities such as fisheries, poultry, small business, etc.; (c) initially crop loans should be provided, later this may be expanded for purchase of irrigation equipment; and (d) duplication and overlapping of activities by the NGOs should be avoided. There is no denying the fact that most of the NGOs are heavily dependent on donor funding. These organizations would better serve their clients and themselves by introducing transparency in their accounting practices and cost-reducing innovation. This will not only help them to attract donor funds but also ensure sustainability of the credit programs.

Palli Karma Sahayak Foundation Model

An important institutional innovation towards sustainability is the Palli Karma Sahayak Foundation (PKSF). The Foundation is an autonomous institution that lends to credit MBIs for on-lending. Established and funded by the Government of Bangladesh, the PKSF's policy has focused on gradual expansion and capacity building of its partner organizations (POs). It has a strict set of eligibility criteria that POs need to satisfy to borrow funds. It closely monitors POs financial accounting practices. PKSF has acquired valuable expertise over the years and is now in a better position to absorb loan funds than when it was initially set up. Considering its performance, the USAID and the World Bank informally suggested the involvement of the

PKSF in providing credit facilities to small and marginal farmers. In a meeting with the MOA, the PKSF, however, expressed their intention to limit their activities to the off-farm sector. It was emphasized that the PKSF is mandated to help the poor, the landless and the assetless in order to enable them to gain access to resources for productive undertakings and/or self-employment and for enhancing the quality of their life. A new PKSF type institution exclusively for meeting the credit needs in agriculture sector, could be considered separately.

A New Credit Facility for Smallholders

The potential for using the group lending methodology for small and marginal farmers is yet to be fully exploited. Little effort has been expended so far in developing a suitable mechanism to reach them. Government may consider setting up a Smallholder Agriculture Fund (SAF). The proposed SAF may be created under the Private Company Act, 1913 which is also the basis of the foundation of PKSF. The name of the proposed foundation may be Krishi Rin Foundation (KRF).

Organizational Structure

The organizational structure of the KRF may be descrived as follows:

1. ***General Body***

The general body may be formed by 10-15 members and should be drawn from both private, NGO and government sector. The general body will provide overall policy guidelines and direction for the efficient functioning of the Foundation. It will approve the annual budget of the Foundation drawn up by the Governing Body.

2. ***Governing Body***

The Governing Body will comprise of seven members. It will pursue and carry out the objectives of the Foundation. The Governing Body will be responsible for the management and administration of the Foundation. It will determine the direction and scope of activities of the Foundation. The Managing Director who will also be a member of the Governing Body will act as the chief executive of the organization. By virtue of his being the chief executive and a member of the Governing Body as well, he will maintain liaison between the Governing Body and the management cadre. The Managing Director will be appointed by the Governing Body of the Foundation in consultation with the government. His emoluments, benefits, facilities as well as his employment with the Foundation will be governed by such terms and conditions as may be determined by the Governing Body from time to time. The Governing Body will hold at least four regular meetings every year. All meetings of the Governing Body will be presided over by the Managing Director of the Foundation.

3. ***Supporting Officer/Staff***

A team of committed, meritorious and capable officials having the right aptitude will be recruited with the objective of putting together appropriate institutional structures, professional excellence and a capable management cadre for the Foundation.

4. ***Activities of the KRF***

There will be three main activities of the Foundation of which credit program is as follows:

Credit Program

The credit program of the KRF will not be run directly by the Foundation. It will serve as an intermediary to provide funds to both NGOs, private and government agencies who will ultimately provide loans to smallholders in agriculture (holding more than 50 but less than 250 decimals of agricultural land) on a cost recovery basis. This will ensure cost-effectiveness and better management at the field level. The borrowers will have to be organized in groups comprising of not less than five members. All group members must be residents of the same village and groups must be formed with like-minded people from similar economic strata having confidence and trust in each other.

Special Features of the Foundation Credit Program

(a) The Foundation will claim service charge of 3-5 percent from POs and the POs in turn will charge interest rate from their beneficiaries. The POs would charge an interest rate that is enough to break-even. The KRF will ensure that there is never an interest rate subsidy to smallholders, nor the POs would allow a default cost of more than 3 percent.

(b) Loan received by the POs from KRF will be repayable within a maximum period of one year. Loan may be repaid on quarterly installments with service charge within 10 months.
(c) The small and marginal farmers will have to repay loans within six months preferably after every harvesting period.
(d) The administrative and related expenses in connection with the credit programs of the POs will be met from the service charge received from beneficiaries.

In addition to the above, the Foundation will provide advisory services, training and administrative support to the POs for running their credit programme efficiently and effectively. The research activities of the Foundation will be directed towards evaluation of the micro-credit programs as well as improvement of the condition of the board. A comprehensive monitoring and evaluation system will be developed to assess the activities of the Foundation and its POs.

Sources of fund for the Foundation will be the following:

(a) To run the KRF, there will be an initial capital to the tune of Tk.1 billion. Of this, Tk.500 million will be the Government of Bangladesh contribution and the rest will be made available as grant from USAID counterpart fund. Under PL-480 Title-III agreement, USAID will make this fund available to the MOA;
(b) Fees and charges for services rendered by the Foundation;
(c) Income from investments; and
(d) Income and receipts from other sources.

The following criteria may be followed in selecting the POs:

(a) Organizations dealing with agricultural activities and having capacity and experience in micro-credit work with a minimum loan recovery rate of 90 percent on a continuous basis will be selected.
(b) Organizations which do not possess sufficient experience but have the required potential will be brought to the level of other POs through capacity building by providing them with necessary training and other technical assistance for strengthening their organizational capacity. Other criteria for selecting POs are: (i) assessment of working area; (ii) organization; (iii) field activities; (iv) past performance; (v) human resources; and (vi) Management Information System (MIS) and sound accounting system.

Monitoring and Evaluation of Credit Program of POs

Loan approval, disbursement and repayment from the farmers to the loan receiving organizations such as POs and from the latter to the Foundation is a cumbersome and difficult task. The Foundation will establish a suitable MIS in this regard. Evaluation of the credit program will also be undertaken to assess the impact of the program on the beneficiaries and operational aspects of the concerned POs managing the program.

Internal Procurement of Food Grains-Paddy/Rice and Wheat

As a measure of price support/eliminating distress sale, government should procure paddy from any paddy-growers or traders without certificates from any authority. Suitable steps must be taken by the Food Department to ensure payment of the due procurement price to the sellers and to prevent harassment of the sellers on flimsy grounds of excess moisture and foreign matter and realization of illegal payments by the procurement staff. Possibilities of using folding storage in temporary procurement centers and procurement of food grains through farmers' cooperatives may be explored.

Crop Diversification

The Government of Bangladesh's crop diversification strategy has to be reoriented towards intensification of pulses and oilseeds production in dryland areas through improved moisture conservation, timely planting and soil fertility management in the short run. In the long run, HYVs are to be developed applying hybrid and genetic engineering technology for all non-cereal crops, preferably in collaboration with the private sector. One well-equipped National Biotechnological Institute may be set up with adequate operational fund, to be manned by competent scientists. Integrated crop production, processing and marketing plans are also to be developed and implemented in collaboration with the private sector, particularly for those

commodities in which Bangladesh enjoys a high level of comparative advantage as identified in Quazi Shahabuddin's study (1999). The findings need further fine-tuning for national policy prescription.

Agricultural Marketing

Agricultural marketing in Bangladesh is predominantly atomistic, fragmented and dispersed over 7,500 rural primary assembly markets, most of which suffer from inadequate space, absence of basic infrastructure and lack of satisfactory transportation facilities. Absence of facilities like sheds results in deterioration of quality of produce through exposure to sun and rain. Inadequate space limits access to markets by sellers and buyers, while lack of transportation facilities leads to higher transportation cost and limits competition in the markets. Realization of excess market tolls and charges, deductions and malpractices by traders due to weak enforcement of market regulations, lack of market information at growers' level reduce prices received by farmers. Farmers are unable to hold back their stocks due to lack of credit and storage facilities. There are also substantial storage losses.

However, for overall improvement in marketing, priority attention needs to be given to the following major areas:

* Improvement in marketing infrastructure, preferably with participation of private sector and NGOs under appropriate collaboration with local government bodies;
* Improvement of storage and credit facilities for the growers with large-scale expansion of SHOGORIP Project;
* Revision of and effective enforcement of the Agricultural Produce Market Regulation Act to address existing market malpractices and irregularities and strengthening of the Agricultural Marketing Department; and
* Repeal of the Gur, Sugar and Sugar Products (Manufacture and Movement) Control Order, 1956, production of gur in mill zones.

AGRICULTURE SUPPORT

Fertilizers

Agricultural Structure Improvement Project (ASIP) recommends retention of subsidy to fertilizers in view of the fact that under WTO, Aggregate Measure of Support (AMS) in the form of subsidy to agricultural inputs is admissible upto 10 percent of the value of agricultural products up to 2005, whereas it is now less than 1 percent. Besides, continuation of subsidy is necessary to promote balanced use of fertilizers. Resources available from the withdrawal of subsidy from urea should be provided to phosphatic fertilizers, production and promotion of blended fertilizers, USG and organic fertilizers. Further, integrated plant nutrient system needs to be promoted by creating mass awareness about crop-wise soil nutrient requirements and their balanced supply through various sources, specially manures, compost and biofertilizers for increasing soil productivity. The present system of restricted fertilizer dealership is not conducive to uninterrupted supply of fertilizers and needs review.

Seeds

Since quality seed is a vital component for increasing crop productivity, the production and use of quality seed/planting material should be promoted through publicity, demonstration and training. Bangladesh Agricultural Development Corporation (BADC) may continue to be involved in the production of certified seeds till capability of the private sector is sufficiently built up to assume this responsibility. Meanwhile, private sector may be accorded requisite policy, institutional and credit support for progressively entering into the seed industry, BADC will continue to maintain reserve stock of seeds to meet any emergency situation.

Pesticides

A single well-planned and well-coordinated action program should be launched to improve registration system of pesticides, strengthening market intelligence and surveillance, for quality control, upgrading of technological innovations through research, popularizing Integrated Pest Management (IPM), ensuring

participation of all actors of the pesticides sector, and eliminating the use of banned pesticides. The Plant Protection Wing of Department of Agricultural Extension (DAE) should be bifurcated. Plant protection-related extension work should form part of the IPM Wing and may continue to remain as Wing of DAE, while the regulatory, quarantine and registration work of pesticides may be assigned to an independent agency. There should also be one central and several regional pesticides analytical laboratories under it for initiating research on environment-friendly pesticides, monitoring of pesticide residues and development of effective IPM packages for different crops.

Minor Irrigation

Water use efficiency in Bangladesh is as low as 25-30 percent, implying that much of irrigation water is being wasted through the conveyance system and inefficient on-farm water management. It is essential to minimize this huge wastage of the scarce resource through appropriate measures. With liberalization of import and removal of existing restrictions, the import and sale of shallow tube-well (STW) and Low Life Pumps (LLPs) increased rapidly, leading to the expansion of less expensive irrigation equipment markets. Prices of engines and other irrigation equipment have declined significantly. Farmers now have a wide range of choices with respect to brands, quality and capacity of engines they wish to purchase; this has led to competition in the emerging irrigation water market with fall in water charges.

PRIVATE SECTOR SUPPORT

Growth of Private Investment

Growth of private investment in agriculture has been the lowest among all sectors during the 4th Five-Year Plan period. In 1994-95 investment in agriculture rose by about 30 percent over 1989-90 against more than 500 percent in case of manufacturing during the same period. The main reasons were policy, institutional and legal barriers. However, there have been a number of policy initiatives undertaken by the government in order to boost the private sector. It is expected that these would result in considerable investment by the private sector in the field of HYV/hybrid seeds, agro-industries and development of processed and fresh agricultural products.

Private Sector Involvement in Agriculture

Commercialization of agriculture which is yet to take off is one of the prerequisites for growth in the private sector. However, involvement of private sector in input supply and food trade has been encouraging which has been possible due to policy reforms. Popularization of "contract farming" for export of high value crops will help further the cause of commercialization. Marketing, infrastructure and credit facilities for growers are prerequisites for commercialization and attraction of private investment.

Share of agricultural exports in total value-added in agriculture remained around 9 percent during the recent past. Lack of national level planning for production of exportable crops along with facilities for development appear to be the major bottleneck. Agro-product exporters should be given incentives and export market should be developed for processed products. Export Promotion Bureau needs to be strengthened both in authority and manpower.

RECOMMENDATIONS

1. All country programs for small farmers should be smoothly and successfully implemented by applying all forms of effective mechanism.
2. Extension and training programs should be made more effective and objective.
3. Latest and appropriate seeds and suitable fertilizers should be made available to small farmers at reasonable price and in a timely manner.
4. Irrigation facilities should be modernized and easily accessible to small farmers at reasonable price.
5. Market prices should be made stable and profitable for small farmers.
6. Government subsidy for fertilizer, seed and all kinds of farm machinery should continue.
7. Agricultural technology should be transferred globally and aimed at better prospect of small farmers.

8. Developing countries should be more sympathetic as regards credit and technology support for small farmers of least developed countries.
9. GO-NGO agro-based sectors should be made effective and encouraged both in production and marketing.

REFERENCES

Ahmad, S., 1999. *Information Flow in Agriculture*, NSU, Dhaka.

Asaduzaman, M., 1996. *The Uruguay Round, WTO Rules and the Bangladesh Agriculture*, Bangladesh Institute of Development Studies (BIDS), April 1999.

Bangladesh Bureau of Statistics, 1996. *Census of Agriculture*

Clay, J. Edward and Khan Md Sekandar, 1997. *Agricultural Employment and Underemployment in Bangladesh, The Next Decade*, AERESS Paper No. 4, Bangladesh Agricultural Research Council (BARC), October 1997.

Faruqee, R., 1995. "Linking Agricultural Growth with Macro Economic Policies and Performance in Bangladesh", paper presented in the Workshop on Bangladesh Agriculture in the 21 Century, Bangladesh Academy for Rural Development (BARD), Nos. 5-6, Comilla.

----------, 1998. *Bangladesh Agriculture in the 21st Century*, University Press Ltd.

----------, 1998. *Linking Agricultural Growth with Macro Economic Policies and Performance*, University Press Ltd.

Hossain, M., 1980. "Food Grain Production Performance, Potential and Constraints" (in University Press Ltd.), a paper read at the special seminar organized by the Bangladesh Economic Association held in Dhaka, March 1980.

----------, 1991. *Agriculture in Bangladesh*, University Press Ltd., Dhaka.

Maziruddin, Kazi, 1983. *A Study on Marketing Costs and Margins of Major Food Commodities in Bangladesh*, Data Acquisition Mission (DAM)/FAO Regional Office, Bangkok.

Maziruddin, Kazi, and Serajuddin Sikder, 1984. *Study on Postharvest Losses of the Potato Crop in Bangladesh*, DAM.

Murshed, S. M. M., 1993. "Production, Performance of Bangladesh Agriculture, 1967-70 to 1976-79, An Analysis by Component Elements of Growth", *The Bangladesh Journal of Agricultural Economics*, Vol., 1-2.

Palmer, Jones, 1998. "Showdown in Agricultural Growth in Bangladesh; Neither a Good Description Nor a Description Good to Give", *Sonar Bangla*, UPL.

Parthasarathy, G. and Ashraf Uddin Chowdhury, 1989. "Growth Performance of Cereal Production Since the Middle of 1970s and Regional Variation, the Agricultural Sector in Context", *Bangladesh Agricultural Sector Review Compendium* Vol. 1, UNDP, March 1989, Dhaka.

Rahman, S. H., 1993. "Trade Regime, Exchange Rates and Economic Incentives in Bangladesh Agriculture", *The Bangladesh Development Studies*, Vol. XXI, No. 3, pp. 1-38, September 1993.

Annexure

Profile of Bangladesh

Geographical location:	Between 20.34 and 26.38º latitude Between 88.01 and 92.41º longitude
Area:	147,570 km^2
Population:	128.1 million
Population growth rate:	1.67 percent
GDP:	US$35.7 billion (Tk.1,749.26 billion) (at constant prices)
Growth rate:	5.2 percent
Share of agriculture in GDP:	32 percent
Agriculture labor force:	63 percent
Total cultivable land:	8.77 million ha
Single-cropped area:	2.89 million ha (33 percent)
Double-cropped area:	3.86 million ha (44 percent)
Triple-cropped area:	0.97 million ha (11 percent)
Cultivable waste:	0.61 million ha (7 percent)
Current fallow:	0.44 million ha (5 percent)
Cropping intensity:	179 percent
Total holdings:	17,828,187
Total farm holdings:	11,798,242
Total small farm holdings:	9,422,793

2. REPUBLIC OF CHINA

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INTRODUCTION

Taiwan is small and crowded. A full two-thirds of the island's land area is occupied by mountains and hills, leaving only about 870,000 ha suitable for farming and livestock production. Agriculture in Taiwan has traditionally been dominated by family farms. Today, there are approximately 790,000 farming households, and each household has on average just over 1 ha of land under cultivation. Of this total, only 13 percent are full-time farming households.

In recent years, the annual value of agricultural production in Taiwan has exceeded $12 billion. Crops account for 41 percent of this value, while animal production makes up 34 percent and fisheries contribute 25 percent. Altogether, agriculture accounts for 3.3 percent of Taiwan's gross domestic product (GDP).

Agriculture in Taiwan, however, has several disadvantageous elements such as: (1) the size of the average landholding per farmer is very small; (2) cultivating cost is high and difficult to cut down; (3) natural disasters such as typhoon, flood and frost damage result in agriculture being a high risk proposition; (4) agricultural marketing channels are not very smooth and agricultural products' prices are unstable; (5) greater impact of liberalization and globalization of agricultural trade after Taiwan became the member of World Trade Organization (WTO). All of these elements seriously influence farmers' income and quality of life.

In order to secure farmers' incomes and livelihood, the government has taken many measures in the following areas: (i) technology development and transfer, (ii) marketing and information services, (iii) finance services, and (iv) livelihood improvement for elderly farmers.

TECHNOLOGY DEVELOPMENT AND TRANSFER

For agricultural technology development and training of farmers, Taiwan has established more than 40 agencies including universities, colleges, research institutes and district agricultural improvement stations (DAISs) for carrying out research and extension work in area of crops, forestry, fisheries, animal husbandry, and food processing. These agencies keep in close contact with about 300 farmers' associations (FAs) in conducting technology training and transfer programs. Thus farmers' participation becomes very important in the process of research and technology transfer. As a result of the changing economy and free trade, Taiwan's agriculture sector has been facing strong international competition. At the same time, pursuit of high-quality and healthy foods has generally replaced traditional notions about the importance of daily meals. Therefore, agricultural technology has become a crucial element in increasing operational efficiency and market competitiveness. The current policy objectives are producing goods of high-quality and high added-value, protecting the ecological environment, as well as pursuing a balance between production and consumption through a course of adjustments to ensure a stable income to the farmers.

Current Situation of Research Program on Agricultural Technology

Taiwan's research and development (R&D) programs for agricultural technology are jointly planned and promoted by the Council of Agriculture (COA) and National Science Council. The former focuses on applied research and technical development, as well as demonstration and extension work. The latter

concentrates on supporting basic biological and agricultural research. The research system in agricultural technology includes research institutions of government agencies, universities and colleges, public and non-profit research institutions and international institutions. There are 20 research institutes and DAISs under the COA.

The agricultural technology development in Taiwan is based on goals and strategies aimed at developing value-added products, ensuring the rational use of limited soil and water resources and protecting the ecology and environment, so as to establish a system of sustainable agricultural production. There are nearly 3,000 researchers engaged in agricultural technology. Since 1979, the research projects of agricultural technology have been incorporated into the "Science and Technology Development Program", which then became an important measure for promoting the continued growth of agriculture. The COA has channeled much energy and annual budget, around NT$3.4 billion(about US$106 million), into high-technology research, striking a balance between the interests of production and the ecology.

The strategies of agricultural technology development in Taiwan aim at strengthening technical development for key industries, actively developing agricultural biotechnology, and extension of the agricultural technologies. Main items for R&D include innovation in genetic engineering technology, improving food processing technologies, application of remote sensing technology, automation of farming, fishery and animal husbandry, as well as internet information system.

Structure and System of Agricultural Extension

The objectives of Taiwan's agricultural extension and education work programs are to advance farmers' technical know-how, raise the efficiency of farming operations, improve the quality of life of farming families and develop rural society. The organizational system of its agricultural extension consists of two main lines. The government at all levels act as the sponsoring, administering and supervising agency; while the FAs operating at three levels serve as executing agencies. There are nearly 2,500 extension workers in Taiwan. The present organizational system for agricultural extension is shown in Figure 1.

The major agricultural extension programs of Taiwan encompass rural youth program, home economics program and farmers' extension and education work. The implementation of each of these programs is entrusted to all level of FAs and fishermen's associations. The COA's research institutes and DAISs provide technical assistance to the programs in areas of crops, forestry, fishery, livestock, animal health and agricultural chemical and insecticide research. In order to assist agricultural extension work, the COA provides financial support to public agricultural institutes to set up agricultural extension committees and to hire agricultural extension professors who also work as research personnel at DAISs.

In Taiwan, the main budgetary sources for agricultural extension come from government, FAs and fishermen's associations, and donations. There is a budget allocated for agricultural extension work each year from the COA. On the other hand, the Farmers' Association Law and the Fishermen's Association Law stipulate that FAs and fishermen's associations should allocate 62 percent of their earnings for extension work and farmers' welfare. The unique agricultural extension system, cooperation with government and farmers' organization, builds a very close relationship between extension agents and farmers. Farmers' participation in agricultural innovation, or in the process of agricultural research and technology transfer becomes very crucial in the development and improvement of agricultural technology.

Measures for Agricultural Technology Transfer

Agricultural extension sector plays an important role in the process of agricultural development in Taiwan. In order to transfer new agricultural technology efficiently to extension targets – the important link between the researchers and farmers – various agricultural training courses and agricultural information diffusion network have been set up and strongly supported by the government. In Taiwan, the faculty of agricultural universities and colleges, research fellows of agricultural research institutes and DAISs, and technical staffs of COA work concertedly with the extension sector.

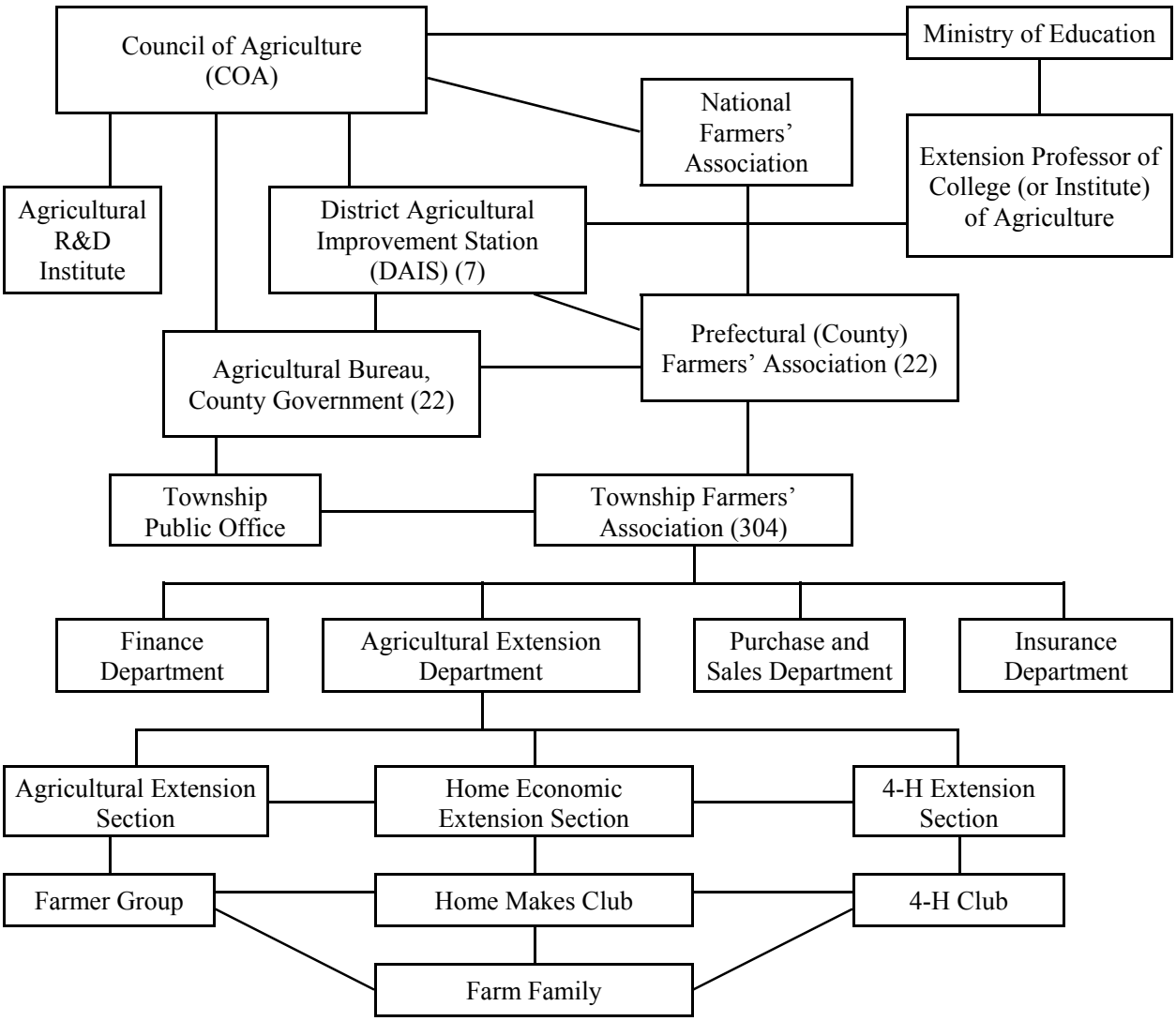

Figure 1. Organizational Chart of Agricultural Extension System

(1) ***Specialized Training for Rural Youth***

To upgrade the farming technology and management ability of young farmers, 66 specialized training classes were held in 2000 for short duration of one month, two weeks and one week in various agricultural specialties including flowers, vegetables, fruits, animal husbandry and aquaculture. In all 1,716 rural youth attended. Follow-up guidance was also undertaken by DAIS's specialists to assist them in resolving problems encountered in farm operations and to promote willingness of the younger generation to remain in agricultural business.

(2) ***Training for Farmers' Groups***

The COA promulgated the Enforcement Rules for Organization of Farmers' Groups, which established a unified system to set up farmers' groups engaged in agricultural production and marketing of flowers, vegetables, fruit, pork, chicken, and aquaculture. Around 6,214 groups have been registered in 2000, with a total membership of 119,797 farmers. In addition, there were 115 training courses conducted by the three levels of FAs, DAISs and universities wherein a total of 5,462 farmers participated.

(3) ***Training for Extension Personnel***

To provide guidance by extension personnel and volunteers, three kinds of training courses, pre-job training, on-the-job training and advanced training, were conducted in 2000. There were 50 classes with 1,500 extension personnel attending these courses.

(4) ***'435 Campaign' – Training for Developing Farmers' Competence to Use Internet***

As a result of the rapid development of telecommunications, it is possible to obtain a great deal of information on technology and market conditions from different web sites all over the world. In order to help farmers acquire agricultural technology and related information from Internet, from this year the COA is promoting a '435 campaign' to train farmers to be able to access the Internet. The objective of the program is to enable 35 percent of farmers' groups to obtain and use information from Internet in four years. There will be 2,000 trainees in the program in 2001 and they are expected to become instructors for next years' programs.

(5) ***Training for Developing a Second Career Competency in the Sector of Agricultural Service***

The COA is initiating a program of developing farmers' competency for a second career in order to overcome the anticipated impact on agriculture in the post-WTO scenario. The main items of training for middle-aged farmers in 2001 are management of green tourism, skill of home care and nursing, and operation of small size farmers' markets.

MARKETING AND INFORMATION SERVICES

The traditional and a generalized marketing system in Taiwan for agricultural products is depicted in Figure 2. The function and relative importance of each step varies from one commodity to another depending upon its characteristics.

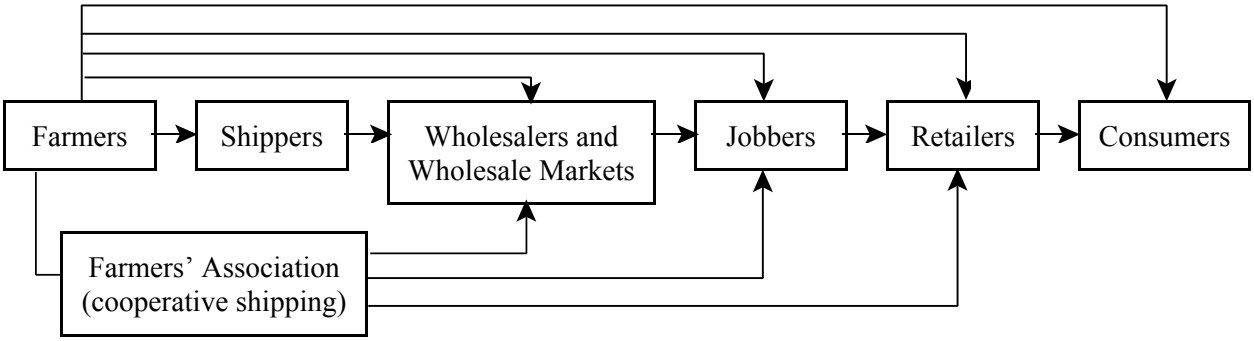

Figure 2. Generalized Marketing System for Agricultural Products in Taiwan

In the entire agricultural marketing system, wholesale markets play a very important role in concentrating, distributing and pricing functions. In Taiwan, there are 148 agricultural produce wholesale markets set up by local governments, which provide services for vegetables, fruits, flower, hog and fishery industries.

Instructing Farmers' Organization to Establish Cooperative Marketing Shipment System

To improve vegetable, fruit, flower, hog and fishery products marketing system the government has assisted and guided farmers' organizations to undertake cooperative marketing for shipping products to the wholesale markets in major consumption areas since June 1973.

The government has made major efforts to assist farmers' groups financially in building collection centers and strengthening equipment, as well as in developing better grading and packing facilities. Cooperative marketing has been widely adopted by the farmers in major producing areas. The township FAs/ fishery associations are the nucleus for handling cooperative marketing shipment.

FAs (fishery association) combine with wholesale markets to provide farmers (fishermen) a series of grading, packaging, transportation and selling services, and the rate of service charge is 1-2 percent only. These enable farmers (fishermen) to concentrate on production operation, and obtain a stable and reasonable income. For farmers, the cooperative shipping system is a very vital and useful service.

Application of Computerized Auction in Wholesale Market

With the development of computer technology, computerized auction systems are being used in wholesale markets since 1991, and now play a very important role in many fields. The auction system is often

described as "the heart of the market". The application of computers has made the auction systems more efficient and effective. For example, the major benefits of computerized auction in livestock and flower markets are usually identified as speed, transparency (fairness in trade practices) and instant completion of paper work. In the past few years, two types of computer-aided auction systems were developed, the movable auction machine and the wireless transmission computerized auction system. Both of them made the flow process of auction more rapid and transparent. In a traditional non-computerized auction, it was virtually impossible for the auctioneer to be certain which buyer from among the large number had bid first. Using a computer auction system, every buyer has an equal opportunity in the market.

So far in agricultural wholesale markets, 70 percent of the trade is transacted using computerized auction system. The price of agricultural produce is determined by the forces of supply and demand. Farmers' benefits are no longer cornered by middlemen.

In the future, in order to upgrade the wholesale market operations competitiveness, it may be useful to raise the using rate of computerized auction in wholesale markets.

Marketing Information Report Service

In order to modernize the shipping system for agricultural products at proper time, quantity and destination, several measures for enriching the quality and content of market information, have been implemented since l974. The measures which are extended to various wholesale markets and enhance the speed of information circulation are as follows:

(1) Reporting Items: Including vegetables, 98 items; fruits, 52 items; fish products, 359 items; livestock, 3 items; poultry, 4 items; and flowers, 42 items.
(2) Categories of Contents: The contents of marketing information refer to kind of products, prices and quantity traded in wholesale markets, total trading volume and overall average price. Trading prices are also classified according to variety, methods of transaction, auction or negotiation, package specification (weight), quality grade as well as daily information digest.
(3) Reporting System: The tele-video system in Chinese has been overall practiced since June l988 to take the place of traditional teletype systems for improving the efficiency and correctness of marketing information. At the end of 1995, there were a total of 599 units, including 67 reporting station and 532 informing service units, to provide immediate market information by BBS internet to serve as reference for adjusting supply and demand as well as stabilizing prices. From July 2000, the cyber media was furthermore upgraded to WWW internet. This improvement ensures that suppliers, buyers and the produce industry can procure information useful to them.

Developing Agricultural Electronic Commerce System

The government has developed the *e*-commerce system for agricultural products since 1999. The major works include establishing B2C (business to consumers) web sites for farmers' marketing organizations, and planning fundamental programs for establishing the standardization system of produce quality grading, packing specification, and coding system. These could pave the way for B2B (business to business) environment specially for agricultural wholesale markets. In addition, strengthening human resource training, security regulation and integration of available social resources including IT (Information Technology), logistics and financial systems are important subjects in the near future.

FINANCE SUPPORT

Agricultural finance is one of the most important tools for agricultural development in Taiwan, since the farming system is becoming increasingly capital-intensive. The policy is primarily to provide adequate credit to support the policy-oriented agricultural development measures in particular and agricultural production in general. On the one hand, the government develops policy-oriented farm credit schemes on soft terms, (i.e., low interest rate, long term) to provide financial support to farmers and fishermen for policy-favored operations, e.g., mechanization of farm operations, enlargement of farm size, planting of high-value crops, employment of energy-saving fishing vessels, engagement in joint production and marketing in specialized production zones, etc.

Main Agricultural Loans in Taiwan

The COA made use of Agricultural Development Fund and continued to strengthen loan services and provide operation capital to farmers and fishermen. In 2000, the fund provided loans totaling around $174.33 million, including $74.36 million for accelerating village construction, and $64.00 million for purchasing agricultural machinery for farm mechanization, $22.91 million for purchasing land, and $13.06 million for farm house renovation. A total of 4,760 households received loans. From 1973 to the end of 2000 the Agricultural Development Fund loaned out a total amount of $3.42 billion to 334,855 farm families. Since the lending terms and conditions were favorable with suitable technical support, the program was very popular with farmers and fishermen (see the following table).

2000 Agricultural Development Fund Loan Implementation

Categories of Loan Provided	Amount ($ million)	Achievement
Acceleration of Village Construction (including: i) assistance to rural youth in starting or improving agro-business; and ii) encouraging group farming or cooperative agro-business)	74.36	Assisted 1,586 farmers, fishermen, and farmers'/ fishermen's groups to acquire capital.
Agricultural Machinery	64.00	Assisted farmers and fishermen to purchase machinery, 2,143 pieces for farming mechanization.
Land procurement	22.91	Assisted 293 households of farmers to buy or inherit farmland for over 93 ha through the loans, the average farmland increased from 1.05 ha to 1.37 ha, or an enlargement rate 30.
House Improvement	13.06	Assisted 738 households of farmers and fishermen to acquire funds for house improvement.
Total	174.33	

Agricultural Credit Guarantee Fund

This fund was established by the government finance institutions and FAs in 1983 to ensure sound agricultural development and to improve farm income. The aim was ease the investment loans extended to farmers and fishermen and guarantee the loan repayment to lenders.

Those farmers or fishermen who are short of sufficient collateral or sound financial condition may obtain guarantees from the fund and receive the needed operating funds. The credit guarantee service enables farmers and fishermen to obtain credit to improve their investment abilities and living standards. The fund was set up to share the risks of agricultural credit institutions, so that these agencies would be in a better position to participate actively in offering agricultural loans and help in the implementation of the agricultural policies.

Agricultural Operation Consultant System

So far the government has already authorized about 300 agricultural operation consultants, who are also government workers stationed all over the country. These consultants are obliged to offer services as follows:

(1) To help farmers and fishermen understand the available loans offered by agricultural credit institutions.
(2) To help farmers and fishermen in applying for loans, including creating awareness of the processing procedures, setting up business plan, completing loan applications and filling out related forms.
(3) To help coordinate agricultural credit institutions for loans rejected by credit institutions, and to apply for agricultural credit guarantees from the Agricultural Credit Guarantee Fund.
(4) Assisting farmers and fishermen with effective capital use and, if necessary to dispatch technical specialists to extend production technology, business management and other advisory services.

This system not only helps farmers solve financial problems but it also provides them with consulting services on operational management and production technology.

Agricultural Natural Disaster Relief

To alleviate agricultural losses due to natural disasters, the COA assisted victims with production restoration and farm reconstruction through cash relief funds and bailout loans, according to the "Agricultural Natural Disaster Relief Methods" and related standards. The natural disasters refer to damages caused by typhoons, torrential rains, earthquakes, cold currents, foehns (also spelled fohns) and other disasters. The above-mentioned relief funds or loans were only granted to farmers who are practically engaging in agriculture, forestry, fishing, or animal husbandry under the law. The approved Agricultural Natural Disaster Relief after the torrential rains and typhoons during summer 2000 was provided to 28,648 farmers in a total amount of $18.17 million. Cash relief funds ranged from $120 to $900 per hectare. In addition, a total of 173 farmers were granted a bailout loan of up to $100 thousand per person at an annual interest rate of 4.5 percent. The loan amounted to $2.72 million in total.

Assistance for Low Income Farmers and Fishermen

In accordance with the "Farming and Fishing Residence Subsidy Plan", the COA has provided special funds to help farming and fishing households with low income to repair and build residences. At present, each household can obtain a subsidy of as much as $3,200. Eligible households can apply for the loan at local government offices. This plan has assisted 11,981 households between 1992 to 2000.

Income Generation (or Home-based Businesses) Program for Farm Women

The COA predicts that with strong competition from ever-increasing agricultural imports and in light of the country's effort to join the WTO, the impact might be tremendous and threaten the livelihoods of some farm families. Therefore, it is the policy of COA to develop the ability and skill of managing income generation (or home-based businesses) program of farm women to earn off-farm income. Every fiscal year there are programs such as "Home Economics Extension", "Specialized Training for Job-Transfer", etc. approved by the government and appropriate budget to implement it.

The idea of the income generation program is to utilize the resources of agriculture, pretty landscape, spare time of farm families, etc. to earn off-farm income. The items of income generation businesses for farm women includes country restaurant, food processing, bakery, farmer's market, compost processing, bed and breakfast, home-maker services (simple nursing care techniques) or nursing aid services, beauty parlor, hair styling, handicrafts, etc.

In 2001, this program has been assisting 21 teams in the rural areas. Each team has more than 10 women members who enter into the income generation program. It will create 268 part-time job opportunities for farm women and the estimated profit will be $250,000.

Welfare Subsidies for Senior Farmers

In order to look after the life of Taiwan's senior farmers and increase their well-being, on 31 May 1995, the government promulgated the "Temporary Statute of Senior Farmers' Living Allowances". This is only an interim measure before the implementation of the senior farmers' pension policy. According to the Bureau of Labor Insurance, from 14 August 1995 to 31 December 2000, a total of 647,222 people were granted with such living allowances (the amount granted in the year 2000 totaled $0.81 billion).

Currently, the Council of Economic Planning and Development of the Executive Yuan is drawing up the national pension system, which also takes senior farmers' pension plan into consideration. When the national pension system comes into effect, senior farmers will naturally become insured and receive their pension according to the law, and the interim allowance system will be replaced and the livelihood of the farmers can be taken care of, better.

LIVELIHOOD IMPROVEMENT FOR ELDERLY FARMERS

In the rural areas of Taiwan, there has been a great change in the socioeconomic structure in recent years. Because of low agricultural income, the younger generation moves to cities for jobs. Therefore, the aging phenomenon is becoming serious in the rural areas compared to the cities. According to the

Agricultural Censuses of Taiwan in the year of 1985, the population of 65 and above in agricultural household had reached 6.96 percent, and in 1999, it had already reached 14 percent. In rural areas there are an increasing number of households with single aged as well as the households comprising only of the elderly and children without young and middle adults.

Migration of the younger generation and the aging phenomenon have been on the increase in rural areas. In some agricultural counties, two-third of the members of farmers' groups are 65 and above. The percentage of farm owners aged 65 and above is increasing. In the year of 2000, 32.5 percent of farm owners were 65 and above.

Starting from 1988, the COA began to develop strategies to improve the livelihood of the rural elderly through home economic extension systems. Topics related to improving livelihood of the rural elderly have been provided via home economics improvement clubs and extension training courses, classes for extension personnel and farm families.

In the fiscal year 1991, 10 district fishery associations were funded and supervised to try on the Livelihood Improvement Program for the Rural Elderly. The target population of services were the elderly. The elderly aged 65 and above were organized into groups on an average, each group consisted of 20-30 elderly members (the content of services will introduce later). The program turned out to be very successful. The elderly recipients benefited much from the services, therefore, the program has been continued and expanded.

In recent years, many FAs and fishery associations have applied for the following programs to serve the rural elderly.

Increasing Social Support for the Elderly Farmers

The program requires that the FAs applying for the project need to recruit the rural elderly who require services and organize them into groups. The elderly group members can interact, help, share and support each other, thus increasing the social support for the elderly. Most of home economics extension agents work very hard to serve priority clientele, especially, those who are lonely, depressed, unhappy and withdrawn. Many of them seldom attend any kind of social activities. There are also the elderly on wheel chairs attending the program. For these elderly, to get out itself has therapeutic effect. Many elderly recipients said that after joining the elderly group, life became colorful and cheerful. There was always something to expect and to do, also someone to talk to and to share. There was no more depression and loneliness. They said it was wonderful to have friends. Some elderly stated that their interpersonal relationship had improved, and they got along better with their family members, too.

Early Detection and Control of Health Problems

Though health services are available, the elderly are usually not aware of their health problems. According to COA's studies, farm people do not accept undergo physical check-up. Chronic diseases or conditions (silent killers) are prevalent. They also lack ability to utilize health facilities to maintain and improve their health. Health agencies have difficulty in reaching out to the farm population.

One of the important accomplishments of this program has been the early detection of health problems and their control. In fiscal year 2000, there were 6,617 elderly receiving physical check-ups, in 3,121 out of them, they found chronic diseases or conditions. The bone density problem (osteoporosis) was the leading problem, followed by BMI (mainly overweight), high blood pressure, high cholesterol, etc. Cases with health problems are advised to visit physicians to follow up their problems, and classes are organized to give courses on healthy life styles to control chronic diseases and conditions including consultation on diet, nutrition, exercises, managing stress, coping, etc. The elderly are grateful for the program for addressing their health problems. The analysis of follow-up and check-ups revealed that some of the health problems such as high blood pressure, high triglyceride, cholesterol, blood sugar and gout had improved or were under control.

Increasing Knowledge and Coping Ability

Courses offered for the elderly include the following: aging and accident prevention, diet and nutrition, healthy life styles, prevention and control of chronic diseases, psychological adjustment, living and coping, home care for the aged, reading and writing.

Though the elderly learn slowly, many of them are highly motivated and study hard. Many are illiterate, since they did not get a chance to study when they were young. Many of the elderly learn to write their own names, to make telephone calls, to take buses, etc. These make their every day life easier and happier than before.

Engaging in Exercises and Recreation

Lack of exercise and recreation are common phenomena among the elderly. Exercise and recreation are the best remedy for depression and sadness, relieving stress, and for improving health. This project for the aged puts emphasis on exercise and recreation. Facilities for exercises and recreation are subsidized, such as karaoke, musical instruments, balls and chess. Most of the elderly found themselves engaging in the activities and recreation like singing, dancing, playing games, painting, gardening, handicraft, brisk walking, climbing mountains, touring, outing, Kong-Fu, etc. By engaging in exercise and recreation they felt younger and healthier. Exercise and recreation also help to relieve pain, sorrow and anxiety and promote physical and mental health.

OUTLOOK

Taiwan will join the WTO soon. Cheaper and increasing amount of imported agricultural products will flood the domestic markets. Farm income are likely to threatened. Thus, agriculture in Taiwan needs to be transformed from merely increasing production to a well-planned, integrated approach combining production, freshness and quality of the produce. In recent years, the government has been making concerted efforts to transform the agricultural structure, to decrease the so-called production-oriented type of agriculture and to develop the services-oriented type of agriculture, such as leisure agriculture (or green tourism).

Agriculture is a basic business of the country. Although, farmers only comprise 7.41 percent of the labor population of Taiwan, the government has already set the following three directions to enable support to farmers:

1. To cultivate high-tech farmers in order to ensure greater competitiveness;
2. To strengthen the farm management ability of farmers; and
3. To improve the living environment and raise the quality of life of farmers.

3. FIJI

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INTRODUCTION

The problems of marketing agricultural, fisheries and livestock products are partially explained by the specific characteristics of and peculiarities of production. The products being resource-based, there is variability in quality of products, production is mainly in batches, bulky and perishable. Producers face price uncertainty and fairly fixed demand.

Fiji's domestic market is an important outlet for agricultural products but is limited by the small and almost static population, remoteness from major markets and the liberal policy towards importation. The Development Program (DP) 7-9 placed a heavy demand on production organization and marketing infrastructure for small farmers to be successfully linked to the identified markets.

Marketing of fresh products in Fiji is usually handled by the producer/farmer himself, selling fresh produce in the urban municipal markets administered by the local government. Marketing activities and their associated institutions have been left mainly to the private sector. Most transactions take place by private arrangement either through family ties or long-held business associations. It is common to market produce through one vendor.

ECONOMIC POLICY

The government has targeted export development as a path to higher income and greater integration into the regional economy. The market-driven policy is designed to reduce distortions to incentives that encumbered the previous policy of import substitution, to allow prices to play significant role in the market and to ensure that economic decisions are driven by the market place.

SOCIOECONOMIC BACKGROUND

Fiji is a developing economy with a large, rural subsistence sector. Fiji's economy rebounded from political turmoil in the late-1980s to five straight years of real economic growth, averaging an estimated 3 percent in 1992 and 1993, and 5 percent in 1994 despite global economic slowdown of the early 1990s. Growth in 1994 of 5 percent was largely attributed to increased tourism and expansion in the manufacturing sector.

Tourism has replaced sugar as the largest earner of export receipts, but both export sector and the industrial composition of gross product are highly diversified across traditional and emergent sectors. Sectors experiencing the most notable performances of recent years include garment manufacturing, a success story partly attributed to a new export-oriented economic development strategy and resource-based industries like forestry and mining.

The main trading partners are Australia, EU, New Zealand, Japan, U.S.A., and Pacific Island countries. Major trade goods for export are sugar (32 percent), clothing, gold, processed fish and lumber, earning a total value of US$607 million (fob, 1995). Imports include machinery and transport equipment, petroleum products, food, consumer goods and chemicals with a total value of US$864 million (cif, 1995).

On an international scale Fiji's economy is relatively poor, with 1996 purchasing power parity GDP of approximately US$5.0 billion. With a population of 758,275 this yields a per capita purchasing parity of US$6,500. Fiji has a labor force of 235,000, which is about 31 percent of the total.

DEVELOPMENT OF AGRICULTURE SECTOR

One of the outcomes of the ADB Agriculture Sector Review in 1995 was the formulation of the Private Sector-led Growth Policy. Facilitating the implementation of the policy was the formulation of the Commodity Development Framework (CDF).

Three essential elements of CDF implementation process were identified as production, processing and marketing. Through the CDF programs it was seen that great emphasis was put on production and processing. Identified as the immediate need for assistance was the area of marketing, thus the conception of Fiji Agtrade as the single trade facilitation instrument.

Fiji Agtrade is the institutional vehicle to operationalize the development of Fiji's agricultural exports. The focus is marketing of Fiji agricultural products both in domestic and international markets. Goal is to facilitate the increase and diversification of Fiji's sustained agricultural trade. Responsible areas are *market information, market development* and *commodity development.*

MAJOR FARM HOUSEHOLDS AND CROPPING SYSTEMS

Agriculture production in Fiji is based on smallholder farmers. About 64-70 percent of farmers in Fiji are smallholder farmers. Most common farm household systems in Fiji can be categorized into two: primary subsistence farming systems and primary commercial farming systems (Chandra, 1983).

Primary Subsistence Farming Systems

The setting is purely subsistence and usually village-based. The needs are of a personal or family nature, where traditional "sharing" in tribes and clans or extended family comes into play. Farms are usually on native reserve land; consist of mainly Fijians in the more remote rural areas (including outer islands). Household farm size is often less than 3 ha and seldom generate enough income to pay for operating costs and provide for family needs.

Subsistence farmers mostly concentrate on root crops production including taro, cassava, sweet potatoes, pigs, poultry and other food crops. Collecting and hunting are extremely important especially in some of the outer islands. There is no management of crops or livestock and no inputs of labor and capital in the productive process. Crops are harvested and consumed or sold as they mature, which could be seasonal, or throughout the year. Wild pig hunting is an important activity. Subsistence fishing, both freshwater and seawater, is an important complementary activity to supplement the food needs of the households. Animal products from traditional sectors are generally utilized as subsistence products in the rural areas.

Primary Commercial Farming Systems

Cropping systems are four basic types: annual monoculture, perennial monoculture, annual rotational and long-term rotational systems (Chandra, 1983). Farm size ranges from 3 to 10 ha. The two main annual monocultural systems are *sugarcane and irrigated rice*. These two crops are grown entirely for commercial sales. Perennial monocultural crops comprise all tree crops; *coconuts, cocoa, citrus, papaw and mangoes*. These crops occupy the land for long periods of time and their products are usually export-oriented.

Annual rotational crops are short duration crops grown in immediate and dry zones. *Wetland and dryland rice, vegetables, pulses, maize, tobacco, watermelons* constitute annually rotated crops. Production is both for subsistence and commercial purposes.

Long-term rotational crops are those crops cultivated for 3-4 years on the same ground with fallow periods then left to revert to bush for 6-8 years. The crops include *ginger, cassava, dalo, yams, yaqona, bananas, plantain and pineapples*. These type of systems are usually practiced by subsistence and semi-subsistence farmers in areas of low land pressure such as the hilly regions of the wet zone.

Livestock Farming Systems

The livestock farming systems have been distinguished on the basis of feeding and housing of animals. These sectors can be distinguished on the basis of market accessibility and infrastructural support. Most improved livestock systems geared for urban commercial markets are extremely capital-intensive and management is an important factor of the production process. Animal production include beef cattle, dairy, poultry, pigs, sheep and goats.

Fisheries System

The fisheries system consists of *aquaculture* (freshwater, brackish-water and mariculture), *inshore* and *offshore* fisheries. However, the fisheries sector in Fiji is divided into subsistence, commercial artisanal and industrial.

(a) *The subsistence fisheries sector* is exploited by villages in remote areas to complement agriculture as an important ingredient of the diet. This sector does not contribute directly to the monetized economic. Fishing is mainly carried out using simple technology, consisting of small boats, handlines, fish traps and seine nets. Most fishing is sea fishing which forms an important sector both for subsistence and commercial production. The important regions of the smaller island groups such as Lau group, Yasawas, Loamiviti, Kadavu.

(b) In the *commercial artisanal*, fishing is mainly in the lagoons and reef edges. Artisanal fishery system is low technology system based on small boats, which go out for a day at a time and bring back small catches. Some other large boats carry ice chests for storage but most of the boats have inadequate storage facilities. This sector provides fish for the urban consumers and others affected by market forces.

(c) The *industrial fishery sector* catches and processes fish for export trade and virtually none of it enters the local market.

MARKET AND MARKET INFRASTRUCTURE

There are no regulations governing the system of marketing, quality and pricing. Marketing of a number of agricultural products is controlled by the private sector such as Fiji Sugar Corporation, South Pacific Foods, Tropical Food Products, Food Processors (Fiji) Limited and private exporters. A number of livestock products are marketed by Fiji Meats Industry Board (FMIB), Foods Pacific, Crest Fiji Limited, Padaraths, Rewa Dairy; fish products by Pacific Fishing Company (PAFCO), Vo-ko Limited and private dealers/traders.

National Markets and Distribution Systems

The method of distribution for fresh farm produce to the urban markets are either by middleman or by retailers or by the farmer himself.

Fresh Farm Produce

There are 12 municipal markets operated by local municipal councils of each urban centers: Suva, Nausori, Korovou, Vaileka, Tavua, Ba, Lautoka, Nadi, Sigatoka, Navua, Labasa, and Savusavu. Several 'mini markets' (roadside stalls) have been set up at strategic places (near supermarkets or near housing estates) to serve as market outlets for fresh produce serving these suburban areas. Seven of such 'mini markets' are located in Nabua, Laqere, Koronivia, Makoi, center point – Laucala Beach Estate, Namaka in Nadi and Raiwasa (New World Supermarket).

Marketing of fresh agricultural products in Fiji is done via four main systems. These are: (a) farmers; (b) middleman; (c) exporters; and (d) processors.

1. ***Farmers***

Farmers living close (within 50 km radius) to urban areas often sell produce in the market themselves. The main crops sold this way are root crops, vegetables and fruits in baskets, plastic bags or heaps. There is no pricing by weight but rather a set price is charged for a bundle of goods depending on the variety, quality and quantity. The previous day's retail is a common base upon which price negotiations begin.

Produce is transported to market through hiring of 3-mt trucks. Usually the individual farm production for sale is small (less than a truck load) resulting in a high per unit transportation cost. Market stall fees are charged in relation to space occupied.

2. ***Middlemen***

The middlemen usually operate as wholesalers and retailers, providing the basic marketing services to the farmers. There are two types of middlemen: those that operate in urban markets and those that operate in rural areas. The middleman in urban markets can be further subdivided into market vendors and truck owners.

a) Urban Market Middlemen: (i) *Market vendors* buy produce from farmers who are able to transport their products from their farms and sell these to other market vendors in the markets. Transaction here is some sort of wholesaling. (ii) The *truck owners* usually own small vehicles who travel to rural areas buying produce along the way and sell to vendors at the market or hawk along the way.

b) Rural Area Middlemen: (i) *Farmer middlemen*: These constitutes the wealthier farmers who own or are able to hire trucks, purchase produce from other farmers and sell to urban markets, possibly to vendor middlemen. Some of these farmers also have stalls in the markets and thus are vendors themselves.

3. ***Exporters***

Market niches for a number of fresh traditional root crops, fruits and vegetables have been identified (Table 1) and exploited for the overseas ethnic communities in New Zealand, Australia and Canada. There are a number of local exporters who export to these markets where they have clients. The clients closely monitor the state of the fruits and vegetables in those markets.

Table 1. Primary Production of Major Agricultural Commodities 1996

Commodities	Production (mt)	Value (US$)	Marketed (mt)	Value (US$)
Sugarcane	4,477,551	238,160,937	4,379,551	232,948,317
Copra	11,002	4,458,966	11,002	4,458,966
Paddy rice	18,888	9,444,000	3,778	1,889,000
Ginger	3,364	1,446,520	2,403	1,358,010
Taro	22,613	13,567,800	6,524[a]	8,200,000
Yaqona	2,685	34,905,000	267[a]	2,400,400
Cocoa	123	166,050	57	51,300
Vegetables	20,701[b]	34,088	20,701	34,088
Papaw	692.4[c]	810,108	13.8[a]	33,135
Pineapple	3,456	864,000	6.85[a]	11,877
Mango	7.9	n.a.	5.9[a]	11,250
Beef	2,401	n.a.	454.15[a]	1,573,293
Pork	791	n.a.	n.a.	n.a.
Sheep	24	n.a.	n.a.	n.a.
Goat	15	n.a.	n.a.	n.a.
Chicken	9,602	33.6	n.a.	n.a.
Eggs	3,781	n.a.	n.a.	n.a.
Fish	17,375	n.a.	n.a.	n.a.

Notes: [a] Exports; [b] commercially produced; and [c] export quality.

The agents inform local exporters when there is a market demand for these products. The agents provide other pertinent marketing information such as the quantity, quality and an indicative price of the consignment. Assembling and packaging of produce is undertaken in the exporter's shed. The produce is thoroughly checked for quality control and assurance by the exporters' trained farm hands.

The produce is covered with special wrappings. Exporters seem to be undertaking necessary procedures to maintain high standards of grading, unblemished and free of disease produce, uniform size and attractive packaging. Quarantine inspection and fumigation are then later undertaken. At present fumigation can be undertaken at the exporter's shed or at the quarantine facility at Nadi Airport.

Prior to this, arrangement for freighting the consignment is made with freight agents who, not only takes the responsibility of getting the produce to the final buyers but advise the exporters in matters of time, cost, cargo space, etc. Some exporters perform this aspect of marketing themselves.

Farmers would normally sell to a licensed exporter. Produce is either delivered to the exporters' packhouse or alternatively, crops are collected by the exporter from the farmers at farm gate point. Licensed exporters grade, pack and cool store the produce, delivering export shipments direct to Nadi International

Airport or Kings Wharf in Suva by trucks for necessary Ministry of Agriculture, Fisheries and Forests (MAFF) Quarantine and Health Department formalities; fumigation, High Temperature Forced Air (HTFA) treatment, inspection, etc. Normally, fresh produce arrives at Nadi 1-1.5 hours before international flight departures.

4. ***Processors***

The marketing system is more or less similar to the exporters' delivery system to the processing house.

Fish Products

Fish are sold directly to consumers at the point of landing, usually on the outskirts of the urban areas or sold through urban markets. The main urban fish markets are Suva, Nabukalou Creek, Lautoka, Labasa and Nausori. There are also selling points along the road and fish stalls in Laqere, Namaka and Vatuwaqa.

Fish are also sold through butchers and fish shops. Fiji Fish Limited is a company which operates a one stop fish shop for fish and fish products in Lami. The company runs a fleet of vessels and uses this shop for selling their 'by catch'. Cakaudrove Fish exports fresh chilled and frozen reef fish to U.S.A., Japan, Australia and New Zealand.

Fish produce from aquaculture farms are sold at the farms or on orders or exported. Viti Corp one of the major fish farms sell fish through Cakaudrove Fish. Ocean Traders in Deuba specialize in tuna jerky for export markets and is Hazard Analysis Critical Control Point (HACCP) certified.

Seaweeds are currently marketed dry by the Fisheries Department. Seaweeds are dried at the farms and transported to the Fisheries Division in Lami to be graded and baled before shipment.

Transpacific (Fiji) Limited fish marketing system involves contracting fishermen (currently 10) to fish and supply fish to the company. The contract includes the company supplying all inputs (fishing gear, fuel, ration, etc) and handles all postharvest and sales. The system is operated with sophistication in terms of technology. In this case the fishermen are left entirely to catch fish, whilst the company manages the marketing.

The company is also HACCP-certified. Crustaceans, molluscs and other non-finfish are marketed mostly by women. Harvested on Thursdays/Fridays and taken to the municipal markets on Fridays/Saturdays by bus or shared transport. A section of the market is designated for sale of crustaceans, molluscs and non-finfish products.

There is a road stall in Davuilevu, 1 km from Nausori town where women from Toga village sell freshwater bivalve '*kai*'. Non-fish products like shrimps, crabs, prawn are sold widely on roadsides along the highway round the island. Fish products such as trochus shells, mother-of-pearl shells are sold directly to traders/dealers for export or to the button factory in Lami.

Livestock Products

1. ***Beef***

Approximately 63 percent of stock slaughtered through registered abattoirs are sourced by middlemen. The stock are purchased for cash at the farm gate on a per head basis on behalf of the butchers. The cattle are transported to the nearest abattoir, slaughtered and sold on a per kilogram basis ex-abattoir.

In the absence of any formal marketing channels, the middlemen clearly form a valuable function in sourcing slaughter stock. The rest of the slaughter stock are sourced through direct producer/butcher negotiations. The abattoir delivers the carcass to the butcher with the butcher being responsible for the slaughter costs (currently ¢29/kg carcass weight).

The abattoir retains the hides which are then sold to the tannery at ¢65/kg (average hide weight, 26 kg) the butcher retains the other by-products such as the heads, tongues and liver. The commercial undertaking unit (CUU) of MAFF is responsible for negotiating sale of cattle from farmers. The CUU sources, transports, weighs and finalizes the sale on behalf of both the buyer and the seller at predetermined prices per kilogram live weight relative to their slaughter value. For this service the CUU charges a 5-percent commission.

2. ***Dairy***

Milk produced on the farm is either directly sold to the urban households and institutions as raw milk by registered dairy farms, sold to Rewa Cooperative Dairy Company (RCDC) for processing, or processed into cream and sold to RCDC for further processing.

3. ***Poultry***

Marketing of poultry meat and eggs is left to the producers. There are four large poultry producing companies: Crest, Padarath, Prasad and Ram Sami.

4. ***Pigs***

Marketing of pigs is carried out by producers themselves to the abattoir. The CUU of MAFF assists the farmers in the distribution of farm inputs and the marketing stock. The main retail outlets are in the urban areas.

The product is poorly distributed because of a predominance of Muslim butcheries and the reluctance of some supermarkets to stock fresh pork. However, processed pork is more widely distributed. The '*magiti*' (traditional Fijian feast) market is dominated by non-commercial farmers who supply pigs for traditional Fijian ceremonies. These are sold live at the farm gate.

5. ***Goats***

Marketing is done by producer/farmers usually through the informal trading system: (i) producers directly to consumers, (ii) sales through middlemen, (iii) commercial undertaking of MAFF, and (iv) recognized marketing locations.

6. ***Sheep***

Live sheep are sold at farm gate.

Processing and Storage Facilities

1. ***Packhouses***

The more efficient licensed exporters are well versed in the quality standard requirements of their prime target markets. Their produce is efficiently graded, packed within their well ventilated and constructed packhouse facilities which are supported by adjacent (on-site) cool stores. The packhouses are certified by the Quarantine Department.

2. ***Disinfestation Facility***

Presently, fresh produce specifically the 'fruit fly hosts' are treated, graded, packed at the HTFA treatment facilities at the Nadi Airport, managed by Nature's Way Cooperatives, whose members are horticulture farmers and exporters. The HTFA facility is able to provide a heat-based fruit fly disinfestations treatment for export-approved horticultural products. It has been in operation for two years as of August 1998.

3. ***Copra Mills***

Dried copra is transported to the mill where it is sampled by a Coconut Board Grading Officer. The four copra mills in Fiji, two in Lau Group (Lakeba and Vanuabalavu) built to reduce transport costs help in increasing the value of outer island copra production and generating employment. Copra Millers of Fiji are managed by Punjas and Sons who provide management backup and operational support, marketing expertise and access to bulk shipping rates utilizing surplus capacity on grain ships returning to Australia. In February 1998, Commodity Traders was given the license to export copra. This broke the monopoly held by Copra Millers of Fiji consequently benefiting the farmers.

4. ***Abattoirs***

There are two abattoirs: Nasinu Abattoir in the Central Division situated about 14 km from Suva and Vuda Abattoir in the Western Division side of Viti Levu both managed by FMIB. There are about six private slaughter houses in Taveuni, Dreketi, Savusavu and Seaqaqa in Vanua Levu. 'Bush killing' is a common practice especially for '*magiti*'. After killing at the abattoir the carcasses are taken to individual butchers where they are prepared into saleable cuts. For poultry processing there are two registered poultry slaughterhouses, Crest and Padarath.

5. ***Canned Meat***

The canned meat industry is dominated by two local companies, Food Pacific Limited and Vo-KO Limited. Boneless meat (mutton, beef) is imported for the domestic canning industries.

6. ***Canned Fish***

The canned fish industry is operated by two companies, PAFCO and Vo-Ko Limited. PAFCO with 51 percent shares owned by government purchases fish from foreign vessels.

7. ***Dairy Factory***

The RCDC is the sole processor of domestically produced whole milk and cream in Fiji. The factory is located in Nasinu, 6.0 km from Suva. Milk is collected daily from the more accessible farms and twice weekly from 31 chilling centers, RCDC is also engaged in importing, repackaging and marketing of all dairy products such as butter, ghee, cheese and powdered milk.

RCDC is owned by cooperative of dairy farmers and gets regular government grant as part of its operational budget. Lodhias and Punjas are involved in importing and repackaging of powdered milk.

Telecommunication

Through a combination of submarine telephone cables and satellite facilities, Fiji is accessible by relatively good and sophisticated international communication system. Fiji operated an international direct "country to country" dialing system. Domestically, it has an excellent and expanding range of telephone, radio telephones, *e*-mail, internet, facsimile and telex facilities.

Road Transport

Fiji has around 4,000 km of road, 1,200 of which are of an all-weather standard. On the main island of Viti Levu a 500-km highway circles the entire island. Suva the capital is connected with Nadi (the country's main international airport) by an international standard 221 km highway.

In 1995, Fiji's vehicle population stood in excess of 97,000 private cars, taxis, goods vehicles, buses, tractors and other motor vehicles.

Shipping

In general Suva handles general cargo whilst Lautoka and Labasa primarily handle sugar, molasses, wood chips and imported petroleum. Savusavu is being developed to be the second port of entry in the Northern Division.

There is frequent and competitive shipping services, serving the outer islands monthly. There are also a number of excellent inter-island "roll-off-roll-on" passenger and cargo ferry vessels.

Aviation

Fiji has direct transport links to the major Pacific Rim and European markets by air. Supported by a well-established domestic air services network, Fiji is well served by excellent regular international passenger carriers: Air Pacific, Fiji Air, Air New Zealand, QANTAS, Japan Airline, Air Nauru and recently ANSETT of Australia.

PRICE INFORMATION

Price information for both domestic and export markets are disseminated to producers through the radio, newspaper, marketing newsletter, exporters and Fiji Agtrade of MAFF. Average weekly wholesale prices both domestic and export markets for fresh produce (fruits, vegetables and root crops) are published through local newspapers, *The Review* and rural program broadcasts with the Island Network Radio station every Thursday evening in three main languages, English, Fijian and Hindi. These broadcasts do not include fish and livestock products.

Sources of these price information include weekly market surveys of major municipal markets by Fiji Agtrade, South Pacific Trade Commission of Australia and New Zealand, Coconut Board, Fiji Sugar, Marketing Board, Fiji Ginger Industry Council and Exporters. The exporters source their prices overseas from their agents/importers.

The Fisheries Division and the Animal Health Divisions of MAFF conduct their own market survey with butchers, CUU, fish markets, restaurants and hotels.

Fiji Agtrade collects, analyzes, collates and publishes domestic and major export countries' market information through *Fiji Marketing Newsletter* (quarterly publication), and *Weekly Radio Broadcasts*. These market information include price and throughput profiles for domestic, imports and exports. Distribution includes Fiji foreign embassies, extension officers of MAFF, major exporters and other line Ministries.

MARKETING BOARDS

In the 1980s government played a major role in establishing, regulating and development marketing organizations for the major commodity sub-sector. Government organized producers into cooperatives to control, liase, transport and market produce. The National Marketing Authority (NMA), corporatized into the National Trading Corporation (NATCO) in 1991, and Fiji Sugar Marketing Board were set up solely for marketing purposes. Other commodity boards were to administer the specific industries:

Sugar	– Fiji Sugar Marketing Board
Coconut	– Coconut Industry Board
Cocoa	– National Trading Corporation
Ginger	– Fiji Ginger Industry Council
Dairy	– Fiji Dairy Industry Board
Meat	– Fiji Meats Industry Board
Fruit and vegetables	– Fiji Fruit and Vegetable Industry Council
Root crops	– Fiji Root-crop Industry Council
Yaqona (kava)	– National Kava Industry Council
Agricultural products	– National Trading Corporation and Fish.

National Trading Corporation

NATCO is a government-owned corporation established to facilitate and develop internal and export markets for agricultural, marine and handicrafts products. It is also responsible for improving the quality and presentation of produce, assisting in coordination of the distribution of produce to markets, developing the processing sector and providing supportive services to the exports sector.

NATCO had engaged itself in activities of direct trading and distribution of agricultural produce, its activities have not been successful. NATCO is currently up for sale.

Fiji Meats Industry Board

The FMIB is empowered to build, operate and maintain registered abattoirs. It currently operates two abattoir at Vuda and Suva plus a tannery. FIMB's main functions are only limited to the management of the abattoirs whereas marketing aspects are critical to the growth of the industry.

Coconut Industry Board

The coconut industry is regulated by the Coconut Industry Board under the Coconut Industry Act, 1965. It is responsible for administering the pricing formula, grading standards and licensing of processors and traders. The Board is supported by a growers' advisory council whose responsibility is to advise the Coconut Board on all industry-related matters other than industrial relations and wages.

The Coconut Board under the Copra Industry Loans Act (CILA)operates an interest-free 'loan' account as a stabilization fund. Until the year 1998, copra millers were the sole buyers of copra. Since the approval of license to trade copra, another copra buyer/Commodity Traders have assumed marketing of copra. The result has been an increase in the price of copra from US$300/mt to US$670/mt ex-warehouse.

Fiji Ginger Industry Council

The Fiji Ginger Industry Council under the Fiji Ginger Act, 1995 has assumed the responsibility of providing the industry with an environment in which it can prosper and successfully meet the competitive challenges from ginger industries in other countries. Government will continue to play a major role in the creation and facilitation of conditions necessary for a healthy ginger industry.

Fiji Root-crop Industry Council

The Fiji Rootcrop Industry Council (FRIC), Fiji Fruit and Vegetable Industry Council, National Kava Industry Council, Fiji Offshore Fishery Industry Council, Fiji Aquaculture Fishery Industry Council have been established to assume the role similar to the Fiji Ginger Industry Council. The intention is to allow the industry to manage and direct its own development.

MARKETING EXTENSION

MAFF has a Commodity Development and Marketing (CD&M) Unit within the Economic Planning and Statistics Division which is responsible for all agricultural marketing matters; specific marketing studies, formulation of marketing strategies, compilation, verification, rationalization and analysis of agricultural information, pricing exercises, generating marketing intelligence (both domestic and international), monitoring commodity agreements, formulating and reviewing agricultural marketing policies. It is responsible for the formulation of commodity development policies in close liaison with National Planning Office and compiling commodity profiles.

Since farmers do their own marketing, they are well aware of the implications of market forces. However, they usually pressure government to intervene in terms of price stabilization especially for seasonal crops. This may be caused by lack of knowledge in supply chain management hence the need for transparency of prices and costs.

Most of the current extension officers have not received training in marketing and therefore are not able to assist farmers in this area. The means of assisting farmers is through workshops and farmer training programs where the staff of the CD&M Unit of MAFF disseminate market and marketing information to extension officers and continue to update them through seminars and briefings.

GOVERNMENT POLICIES AFFECTING MARKETING

The 12 strategies that emerged from the agriculture sector review in 1995 has been adopted for implementation of current policy of *Private Sector-led Growth* and *Export-led Growth*. These strategies are directed towards areas where Fiji has a competitive advantage identified as high-value niche markets and in the production of traditional crops.

After a decade (1970s) of protection and government-led investment projects, the private sector has become dependent on the government. Farming had been, and is still largely driven by the need for food or in response to government direction.

During the last decade, circumstances have changed and this has led to a growing awareness within government, of the importance of facilitating rather than directing the growth sector. Starting in 1989 the agriculture sector became a part of the national policy of deregulation. There was a switch from licensing and import controls to tariff protection with gradual reduction in tariffs. The fundamental basis for this change in policy is a recognition that the sector will only have a future in the competitive world if it becomes more efficient.

The transition to private sector-led growth has not been easy. The private sector (farmers, processors and exporters) has found itself faced, with unfamiliar responsibilities. The private sector-led growth means that the private has to lead the way and set the course for the sector; which crops, which markets, leaving the government to play its facilitative role rather than directing growth.

However, benefits of this policy are seen in the dramatic increase in tar exports during 1994-95, the diversification of tobacco farmers to papaya, a more coordinated approach to quarantine by the private and public sectors, private investments in ginger processing, planned diversification in the dairy industry to assist the wet processing of coconuts, the export of processed organic foods to Europe, and the establishment of commodity-'specific' industry councils.

MARKETING INFRASTRUCTURE

The secret of success in the production and marketing of agricultural products is to find or create a market and fill it. Various stakeholders must know the precise standards of the market, seasonal peaks in the domestic production cycle of the importing country, the packaging requirements and the quarantine and quality control needs as well as the transportation and storage systems.

Marketing and Physical Infrastructure

1. ***Transport System***

Urban areas and the immediate surrounding of the suburbia are well served with the transport system. Suffice it to say that, transport facilities may not be greater constraints to 'orderly marketing' in the present

to the medium term, as most of the producing areas are restricted to the major centers. However, lack of reliable and appropriate transport (freezer truck, etc) is crucial to the development of marketing and production of fresh produce in the long term.

A case study of a supplier in a remote island shows that in order to sell his produce, he has to go in a small boat with an outboard engine to the next bigger island. Once landed, they hire a truck to reach the village that has the inter island jetty. Then it takes another two days to reach the main island where the bulk stores/warehouse is located. The time and costs involved in this lengthy ordeal means less profit on the actual product and a loss of quality.

A proposed development for efficient delivery of products from outer islands, would be a consolidation of small island traders to work out a plan to schedule a special ferry service once weekly to their small islands. This would influence the freight forwarder who can accommodate their route in his regular shipping schedule. It is anticipated that the products will reach the market at half the time, much fresher with higher profit margins.

Most islands in Fiji are constrained by transportation and communication linkages due to isolation and the scattered nature of its islands. Fiji being strategically placed with a relatively well-developed transportation and communication systems has direct connections by sea and air to other countries. However, it is imperative to keep up-to-date with all the new developments and logistic changes on the transport sector as the number and frequency of links into Fiji is rapidly improving and growing. The frequency and number of links is closely linked to the tourist industry.

For high quality fresh produce, fast and seamless transport of fresh and chilled products from catching/ farm gate to its final export destination is of greatest importance.

Tuna shippers to European markets need packaging to be extremely good to take into account trans-shipment, i.e., about 10 percent extra packaging for tuna. The airfreight is charged on the gross weight and therefore the differential on transportation to the EU is about 20 percent. Aircraft charter rates are expensive and compounded by difficult conditions of contract. Currently, 10 percent is taken into account for loss due to transportation. Trans-shipment involves 75 percent risk as it is dangerous for fresh produce exports.

Transportation costs vary greatly from island to island depending upon volume and negotiations with carriers/export agents. Collaboration between islands may be a solution to the high transportation costs.

2. *Storage Facility*

There is inadequate cold storage facilities for holding perishable products for export marketing via air. At present there is only one storage facility in Nadi that is in operation. Without adequate storage facilities, the quality of export is undermined thus leaving exporters to face the market risks of quality deterioration, revenue loss and ultimately, market share.

Ideal shipping conditions between the two main islands (Viti Levu and Vanua Levu) would be in reefers. However, volume is a major requirement in facilitating the use of reefers for transportation of fresh produce between the two main islands.

Marketing Institutional Infrastructure

1. ***Freight***

Freight has been one of the greatest constraints in the export of agricultural products in Fiji due to the limited cargo space and the low priority that is given to agricultural products by the airlines. Freight charges for fresh produce to the major markets are seen to be relatively high. This can significantly undermine the exporters competitiveness relative to other producers. Freight within Fiji is also expensive.

2. ***Quarantine***

Fiji exporters are faced with quarantine restrictions that are imposed by importing countries. These may change at any time. For fresh fruits (and vegetables) especially, the strictest quarantine restrictions apply to fruit fly status. With the reduced use of chemical fruit fly disinfestation alternate treatment needs to be developed.

The Bilateral Quarantine Arrangement (BQA) is an arrangement between the New Zealand MAFF and Fiji MAFF covering the use of the HTFA facilities for Fiji to export eggplant, mango and papaya to New Zealand. It encompasses, treatment specifications and monitoring from farm level to inspection on arrival. It requires farmers to be registered and follows recommended farming practices. BQA also describes

contingencies in New Zealand in the event of an interception of fruit flies at the border in any such consignment.

Fiji producers and exporters are seeking to expand the number of products covered by the BQA with New Zealand. They also want to put in place a BQA with Australia.

3. ***Quality Standards/Postharvest Handling***

There seems to be lack of quality control on the marketing of fresh produce by the marketing authority and/or exporting authority to guarantee quality. Although they are produced in a wide range of quality and consumers at the other end of the marketing channel have a heterogeneous demand for different quality. However, exporters have somehow not produced the range of quality that suits the final consumer. MAFF is to facilitate the establishment of a system of field control, inspection and postharvest treatment.

With the reduced use of chemical disinfestations treatment due to perceived dangers from residues, new non-chemical treatment or procedures need to be developed. MAFF is required to look seriously at the importance of HACCP in the exports of fresh produce. The thrust of HACCP involves food retailers protecting themselves against litigation for food poisoning. Food distributors who supply to these food retailers have to put in place food safety systems who in turn are forcing importers to adopt equally rigorous standards. These importers then impose those standards on exporters who subsequently impose them on producers. HACCP allows for identification of the problem (is the critical point), in the event something goes wrong with entire production-distribution line chain, thus minimizing time for remedial action.

4. ***Market Research***

There is no real effort either by the private of the government sector to collect, interpret and disseminate necessary data for the smooth operation of the marketing process of fresh produce. There seems to be insufficient market research carried out to evaluate alternate marketing channels that can be used especially at the local end. Moreover, there is a lack of information regarding opportunities in potential markets in the Pacific Rim countries especially Japan, North America, New Zealand and Australia. Fiji Agtrade has addressed this through a planned approach of Data Acquisition Mission (DAM), Export Development Mission (EDM) and Trade Mission.

DAM enables identification of production, consumption and market trends per product per market. The outcome of the EDM is a construction of a business strategic plan for the development of target product(s) in the target market(s), a more market-oriented approach. This will establish market entry strategies and supply management issues.

A network of contacts should be continuously activated with the embassies in the major importing countries, where officers have good contacts with government departments and individuals who could assist developing countries expand their trade.

5. ***Promotion***

There is need to be innovative. Fiji must concentrate on marketing aggressively for market niches and promoting the intrinsic quality of these products, promotional markets to include market surveys, demonstrations, advertising, test shipment, etc. There is need for a united front to be pursued where one body is responsible for all promotion overseas. All local exporters could levy a small sum for promotional advertising abroad.

6. ***Packaging***

Maximizing returns and minimizing losses to market participants involves utilizing adequate packaging techniques to prevent postharvest losses and quality deterioration. Research efforts need to be directed to developing and refining packaging techniques.

CONCLUSION

Agricultural marketing has three phases: producing the product, processing the product into a market-ready form and marketing the product. These have been the focus of the government sector-led growth implemented through the CDF of MAFF. The core of this framework is the development of agricultural commodities from subsistence to industry level. This requires development of agricultural products marketing system. Fiji Agtrade has been established to be the institutional vehicle for trade both for domestic and international markets.

Government played a major role in establishing, regulating and developing marketing and industry organizations for each commodity sector. These organizations or bodies would manage linkages from production to market leaving government to its facilitative role.

There is a lack of suitable benchmark to compare and measure the performance of marketing systems. The existing marketing systems of agricultural products in Fiji as described above have evolved through time and may have responded to changes. They may not be perfect, but if they function well, they are competitive.

An organized and developed marketing system of fresh produce is vital to the success of production and export of produce. The present system therefore, is subject to scrutiny. Certain aspects of marketing need addressing, modifying and perhaps changing with a view to promoting sufficient supply and a reasonable returns to the market participants.

Storage space and cooling facilities are fundamental to keeping the market system operating without interruption. Concerted efforts are needed by the government (and private sector) to provide adequate facilities at Nadi to facilitate the export of these commodities.

Concerted efforts from government and private sector are required to collect necessary information related to marketing of fresh produce to facilitate and enhance the production and export of these products. Such contracts are useful to the exporters, farmers and policymakers.

A united front should be pursued by both government and private sector to form a body responsible for consultation of capacity and freight charges with airlines officials. Marketing starts at the farm level. The development of export markets for fresh produce requires consistent supplies of produce in volumes sufficient to satisfy importers' demands. Moreover, export development of the fresh produce depends on commercial farming of recognized varieties and using high standards of husbandry practices.

The Extension Division of MAFF together with the help of the private sector should provide demonstration programs so that farmers can receive continuous in-depth training on suitable current farming methods.

The development of horticulture appears to be stifled by a circular causation between a lack of market development and inadequate growth in output. To overcome this problem it is crucial as a policy measure to develop agricultural facilities for the marketing of agricultural outputs. Associated with is the need for proper infrastructural development (such as storage, grading, grading, transportation and local assembling facilities) and also greater institutional support to market participants, such as provision of agricultural extension, information and technology.

REFERENCES

Asian Development Bank, 1996. *Fiji Agriculture Sector Review: A Strategy for Growth and Diversification*, Ministry of Agriculture, Fisheries and Forests, Suva, Fiji.

Central Planning Office, 1993. *Opportunities for Growth: Policies and Strategies for Fiji in the Medium Term*, Government of the Republic of Fiji, Suva.

Chandra, S., 1983. *Agricultural Development in Fiji*, Australian Universities' International Development Program.

Lavalin International, 1982. *Export Market Opportunities for Fijian Food Products: Study Report*, the Export Market Development Division of the Commonwealth Secretariat.

Lincoln International Limited, 1993. *Fiji Dairy Sector Study*.

MacGregor, A., and Julian Peach, 1995. *Agriculture Sector Review*, Ministry for Agriculture, Fisheries and Forests.

4. INDIA (1)

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INTRODUCTION

Agriculture is the most important sector of the Indian economy. It contributes about 25 percent of the total Gross Domestic Product (GDP) and provides employment to about 67 percent of the working population of the country. About 184 million ha of land are reported as agricultural land using about 17 million mt of fertilizer and producing 526 million mt of agricultural produce comprising food grains, pulses, oilseeds, cotton, jute, sugarcane, etc. The food grain production of the country has increased fourfold during the last five decades. However, despite being self-sufficient in the production of food grains farmers are unable to obtain remunerative prices for their farm produce. With the sustained efforts of the Government of India (GOI), there has been continuous increase in quantity and quality of farm produce due to the provision of farm support services especially to small/marginal farmers.

CLASSIFICATION OF LAND AND OPERATIONAL HOLDINGS

India is a large country with a geographical area 329 million ha of which 69 million ha (22.5 percent) are under forest, 42 million ha are (13.7 percent) not available for cultivation and about 28 million ha (9.4 percent) are not under cultivation. One hundred and forty-two million ha of land are under cultivation of which only 53 million ha are irrigated.

The number of landholdings with marginal farmers (less than 1 ha) is 59.4 percent, small farmers (1-2 ha) is 18.8 percent, semi-medium (2-4 ha) is 13.1 percent, medium farmers (4-10 ha) is 7.1 percent and large holding (above 10 ha) is 1.6 percent. Thus the operational holdings with small and marginal farmers is about 78.2 percent but the area operated upon is only 32.4 percent (Annexure I). This indicates the need for various agricultural support services to small/marginal farmers.

AGRICULTURAL PRODUCTION

The agricultural perspective plan of the country, as envisaged by the Planning Commission is summarized in Annexure II. The area, production and productivity of prime commodities during the last five years is given in Table 1.

FERTILIZER

The country's requirement of fertilizers is increasing continuously due to technological developments and increased irrigation facilities. Fertilizer is produced in the country by private, public and cooperative agencies. Prominent among them are in the cooperative sector, namely; "Indian Farmers Fertilizer Cooperative Ltd." (IFFCO) and "Krishak Bharti Cooperative Ltd." (KRIBHCO). Fertilizer is distributed to small farmers through a network of private and cooperative sector outlets. Cooperative sector plays an important role in input distribution through its wide network which ensures that small farmers are able to access a variety of quality fertilizers at their door, at reasonable price. IFFCO and KRIBHCO are the two cooperative giants producing fertilizer and making it available to small farmers through State Cooperative Marketing Federation, Cooperative Marketing Societies and Primary Agriculture Credit Societies.

Table 1. Area, Production and Productivity of Major Crops

(Unit: Area = million ha; production = million mt; and productivity = kg/ha)

Crops		1995-96	1996-97	1997-98	1998-99	1999-2000
Food grain	Area	121.01	123.85	123.95	125.36	123.16
	Production	180.42	199.44	192.26	203.04	201.56
	Productivity	1,491.0	1,610.3	1,551.1	1,619.7	1,636.6
Oilseed	Area	25.96	26.34	26.12	26.71	25.20
	Production	22.11	24.38	21.32	25.21	21.54
	Productivity	851.7	925.6	816.2	943.8	854.8
Cotton	Area	9.04	9.12	8.87	9.29	8.67
	Production	12.86	14.23	10.85	12.18	10.45
	Productivity	1,422.6	1,560.3	1,223.2	1,311.1	1,205.3
Sugarcane	Area	4.15	4.17	3.93	4.08	4.07
	Production	281.10	277.56	279.54	295.73	292.64
	Productivity	67,734.9	66,561.2	71,129.8	72,482.8	71,901.7

The country's production is not enough to meet the fertilizer requirement of small farmers and as such about 3.0 million mt of fertilizer are required to be imported.

Table 2. Fertilizer Production, Consumption, Imports and Their Value, 1994/95-1998/99

(Unit: Million mt)

Year	Consumption	Production	Imports	CIF Value of Imports
1994-95	13.56	10.44	2.96	1,785
1995-96	13.88	11.34	3.96	2,840
1996-97	14.31	11.16	2.03	1,701
1997-98	16.19	13.06	3.17	1,296
1998-99	16.79	13.62	3.15	2,400

CREDIT

Credit is an important and primary input required by small farmers. Efforts to build up the institutional finance system for agriculture commenced with the adoption of the Cooperative Credit Societies Act in 1904. During the first three decades of the century, the village moneylender remained the main source of agricultural finance. Various measures for debt relief and control of money lending, including statutory reduction of amounts due, fixation of maximum rates of interest, protection of agriculturists and specified items of his property against legal proceedings, restrictions on mortgages, etc., were undertaken.

The GOI/National Bank for Agriculture and Rural Development (NABARD) through a network of cooperatives, commercial banks and regional rural banks provide short-, medium-, and long-term credit. The total institutional credit provided during 1998-99 was Rs.380,540 million. The details of various agencies providing institutional credit from 1994-95 to 1998-99 are shown in Table 3.

SEEDS

Quality seeds are another important requirement of farmers. Productivity depends significantly on variety and quality of seeds. The Ministry of Agriculture, GOI has taken many steps in developing quality seeds and also in educating and training small farmers. The State agriculture universities and the various institutes of the Indian Council of Agriculture Research (ICAR) such as Potato Research Institute, Cane Research Institute, etc., are continuously experimenting on high yielding variety of seeds. State Agriculture Departments through extension officers at the block level educate small farmers in the use of modern varieties. The Central Seed Committee has been constituted to assist State Committees for registration of variety of seeds. Besides the private sector, the National Seeds Corporation (NSC) and the State Seeds Corporation (SSC) provide a variety of seeds to small farmers. Annually more than 8.0 million mt of certified seeds are distributed to farmers. The crop wise details are shown in Table 4.

Table 3. Flow of Institution Credit for Agriculture

(Unit: Rs. Million)

Agency/Term		1994-95	1995-96	1996-97	1997-98	1998-99
Cooperative	Short term	72,500	83,310	93,280	107,400	125,950
	Medium/long term	21,560	21,480	26,160	32,270	43,920
	Sub-total	94,060	104,790	119,440	139,670	169,870
Commercial Banks	Short term	n.a.	53,450	65,490	72,990	92,620
	Medium/long term	82,550	48,270	62,340	83,940	88,160
	Sub-total	82,500	101,720	127,830	156,930	180,780
Regional Rural Banks	Short term	6,880	8,490	11,210	13,950	17,200
	Medium/long term	3,950	5,320	5,630	6,430	12,690
	Sub-total	10,830	13,810	16,840	20,380	29,890
Grand Total		187,390	220,320	264,110	316,980	380,540

Table 4. Consumption of Seeds for Various Crops

(Unit: 000 mt)

Crops	1994-95	1995-96	1996-97	1997-98	1998-99
Cereal	413.5	440.3	414.3	517.8	534.0
Pulse	36.0	35.6	41.9	38.9	50.0
Oilseed	120.1	126.4	125.3	128.7	125.0
Fiber	22.0	25.8	31.8	32.1	34.0
Potato	66.2	68.5	66.9	68.3	88.4
Others	0.8	2.4	2.5	2.1	1.2
Total	658.6	699.0	682.7	787.9	832.6

STORAGE-MARKETING

Agricultural marketing includes all aspects of market structure and systems, both functional and institutional. Pre/postharvest operations, assembling, grading, storage, transport and distribution facilities and infrastructure for agricultural marketing in the country have to be considerably improved and strengthened in order to enable small farmers to dispose off their produce at incentive prices, reduce the price spread between the primary producer and the ultimate consumer and ensure the availability of consumer products and agricultural inputs to the small farmers at reasonable prices.

The present marketing structure for agricultural commodities in the country consists of about 22,000 *haats* (village periodic markets) serving an area of 8-16 km radius, 5,000 secondary markets serving an area of 700 km^2, periodic markets towns based hawkers and representative of big traders, who are available at the farmer's doorstep to buy his produce. The small farmer, however, does not get a fair deal in the existing marketing structure because of poor holding capacity and trading malpractices.

The Ministry of Agriculture as a measure to check exploitation of small farmers has taken initiative to intervene in the market through various government and cooperative agencies to procure small farmers produce at a support price declared every year. The agencies like Food Corporation of India (FCI), National Agriculture Cooperative Marketing Federation Ltd. (NAFED) through a network of cooperatives and other agencies procure small farmers produce at a support price.

The State/provincial governments have set up regulated market yards in their respective States. About 80 percent of secondary markets have been brought under the purview of Agriculture Marketing Boards. These market yards provide basic facilities and platform to farmers to market their farm produce. The objective of reorienting the agricultural marketing system is to give the small farmers the benefits of a good marketing facility without subjecting them to the harassment of marketing transactions.

The primary cooperative marketing societies can render this service. The farmers' service societies perform marketing functions on their own wherever cooperative marketing societies do not exist. The FCI and other commodity corporations also strengthen their relationship.

TRANSPORT

Road transport plays an important role in agricultural marketing. The weakest link is rural roads. Rural roads are being improved and a network of rural roads is being developed by *Panchayats* (rural local bodies), and Rural Engineering Corporation. Besides rural roads, State Public Works Department has undertaken the task for construction and improvement of roads, connecting the rural hinterland to market yards, major towns and metropolitan areas. Efforts are being made by railways to increase transport services, reduce detention time at trans-shipment points and avoid procedural delays at the time of booking and unloading. Detailed studies are being undertaken to assess the requirement of various types of rail-vans needed at production and marketing centers. Sample traffic surveys have been conducted in selected areas to collect data on quantity and type of commodities moved. Special types of trucks have been designed to transport perishable commodities by road.

STORAGE

Storage is one of the important requirements for small farmers to prevent distress sale. The private, public and cooperatives sectors are playing an important role in creation of scientific storage capacity for both perishable and non-perishable commodities. The government agencies like FCI, create storage capacity to procure food grains for public distribution system. The Central Warehousing Corporation (CWC) and State Warehousing Corporation (SWC) create storage at district and block level for farmer to store their farm produce. These warehouses of CWC/SWC are licensed godowns confirming to the standard of scientific storage. The farmers can get credit/loan against the warehousing receipts issued by such licensed warehouses to the extent of 75 percent of the cost of produce. Besides cooperatives provide storage at the rural/farm level for small and marginal farmers. The cooperative pledges the produce of small farmers and provide them pledge loan to the extent of 75 percent of the cost of the produce.

Table 5. Storage Capacity Created by Various Agencies (as on 31 March 2000)

(Unit: Million mt)

Sl. No.	Organization	Capacity
1.	Food Corporation of India	19.15
2.	Central Warehousing Corporation	7.48
3.	State Warehousing Corporation	11.39
4.	Cooperatives through National Cooperative Development Corporation (NCDC)	13.74
5.	Various agencies through NABARD	13.49
6.	State government agencies	8.21
Total		73.46

The GOI in order to augment the storage capacity has approved a National Policy on Handling, Storage and Transportation of Food Grains and have invited private sector participation in creating storage. The government has also set up a high level expert committee under the chairmanship of Additional Secretary GOI, Department of Agriculture and Cooperation to suggest a time bound action plan to augment storage/ cold storage capacity in rural areas for the benefit of small farmers. The Committee has recommended creation of 200,000 mt of storage capacity and 120,000 mt of cold storage capacity in rural areas for which 25 percent subsidy shall be made available by GOI.

EDUCATION-RESEARCH-EXTENSION

Education for agriculture broadly covers all formal education in the subject from the school to the university level and also informal and non-formal education meant for those who practice the vocation as

well as for those who support it in various ways. Its aim is to foster a sense of enquiry in every recipient regarding problems of agriculture and a desire to solve them.

One of the goals in agriculture is higher, more improved and diversified production. In order to achieve this, a multidisciplinary approach to the application of science and technology in the development of agriculture is necessary. Science can not be applied to solve problems of food, etc. without bringing the related disciplines together. Just as a single discipline may have a variety of applications in multiplicity of programs, so does a single program involve multiplicity of scientific discipline for its successful culmination.

Extension and extension education relate to the process of conveying the technology of scientific agriculture to the farmer in order to enable him to utilize the knowledge for better agriculture and a better economy. Agricultural extension service imparts the necessary skills to the farmers for undertaking improved agricultural operations, to make available to them timely information on improved practices in an easily understandable form suited to their level of literacy and awareness and to create in them a favorable attitude for innovation and change. Besides imparting knowledge and skills, the objective of extension is to change the attitude and outlook of the farming community. There is need for a major education and extension effort to modernize the outlook of the farmer and make him innovative, enterprising and willing to adopt changing situations and new technology. Education of women in the farm household in subsidiary occupations and nutritional aspects is an important part of the program of farmers' education. The government has set up agricultural universities, colleges, and engineering institutes to impart higher education in the field of agriculture. The government has set up organizations such as ICAR and "Council of Scientific and Industrial Research" (CSIR) to deal with the task of science and technology more precisely and in a rigorous manner. The extension work is being undertaken by Departments of Agriculture of the State governments through agricultural extension officers in the field.

To educate the small farmers' cooperatives are playing an important role in the field. The government has set up a National Council for Cooperative Training (NCCT). Under the umbrella of NCCT, cooperative training institutes have been set up at the State level and cooperative training colleges have been set up at the field level to extend education and research to small farmers by imparting training to the cooperative leaders. The State Registrar of Cooperative Societies through their Development Officers are extending education and research to small farmers in collaboration with the Departments of Agriculture.

GENESIS AND ROLE OF NCDC

The GOI constituted an All India Rural Credit Survey Committee under the aegis of the Reserve Bank of India (RBI). This Committee submitted its report in 1954, designed and laid the foundation of farmers' cooperative for modernizing agriculture and fostering rural economic activities for the benefit of the rural community constituting small farmers. The Committee recommended that while the RBI – now the NABARD, should take upon itself the task of promotion and financing of rural credit cooperatives, the government should set up a statutory corporation for the development of other rural economic activities in the cooperative sector. It was with this background that the National Cooperative Development and Warehousing Board was set up in 1956. In 1963, the warehousing activity was separated and the National Cooperative Development Corporation was created. The NCDC was established in March 1963, under an Act of Parliament as a successor organization to the National Cooperative Development and Warehousing Board set up in 1956. In terms of the NCDC Act the objectives of the NCDC are planning and promoting programs for production, processing, marketing, storage, export and import of agricultural produce, foodstuffs and certain other notified commodities and collection, processing, marketing storage and export of minor forest produce as cooperative principles. The NCDC has provided financial and technical assistance for various activities for the development of small farmers. The NCDC since inception has provided financial assistance to the tune of Rs.52,134.5 million for various activities (Table 6).

The NCDC not only provides financial assistance but also plays a very important role in providing technical assistance. The organization has experts in various fields such as management, textile, fisheries, agriculture, civil engineering, finance, costing, oilseeds, etc. To supplement the field extension services, the organization has set up a trainees training institute named "TOPIC" (Training of Personnel in Cooperatives) to impart training in the field of project formulation, project management, financial management, rural development, etc. The organization's activities are basically small farmers-oriented through cooperative means.

Table 6. NCDC Financial Assistance

(Unit: Rs. million)

Sl. No.	Activity	Assistance
1.	Marketing and input	6,742.5
2.	Storage and cold storage	7,238.5
3.	Weaker sections	6,663.8
4.	Processing	24,723.7
5.	Integrated cooperative development projects	4,369.6
6.	Promotional and developmental activities	856.9
7.	Rural consumers	1,372.3
8.	Credit	176.2
Total		52,143.5

CONCLUSION

In India marginal/small farmers constitute 78 percent of the landholdings and operate only 32 percent of the land. There are a number of government agencies, organizations, companies which cater to the needs of small farmers, i.e., Ministry of Agriculture and Cooperation, Ministry of Rural Development, Ministry of Food and Consumer Affairs, FCI, CWC, NCDC, SWC, NABARD, commercial and rural regional banks, State Department of Agriculture, Registrar of Cooperative Societies, national and State cooperative federations, district collectors, district agriculture officers, cooperative marketing societies, primary agricultural credit societies, etc. There is a continuous upgradation in science and technology. Consistent enhancement in fulfilling the credit requirement, creation of basic infrastructure facilities, viz., storage, transport, availability of better irrigation facilities, high yielding variety of seeds and fertilizer, education through satellite (TV), and through agricultural extension officers has led to overall improvement in agriculture. All this has resulted in the economic development of small/marginal farmers yet several gaps exist. There is need to adopt a mission mode approach to provide various support services to small farmers in a coordinated manner. At the GOI level, the Ministry of Agriculture should be a nodal agency to implement and monitor various support services to small farmers through a technology mission. At grassroots level small/marginal farmers should organize cooperative ventures. The cooperative ventures through their horizontal and vertical linkages can assist small farmers in providing the required support services, i.e., credit, inputs, storage, marketing of agricultural produce, agro-processing, etc. However, to achieve desired results, education and training efforts need to be promoted more vigorously.

REFERENCES

Department of Agriculture. *Agricultural Statistics at A Glance - 2000*, Directorate of Economics and Statistics, Ministry of Agriculture and Cooperation, GOI, New Delhi.

----------. *Abridged Report*, National Commission of Agriculture, Ministry of Agriculture and Irrigation, GOI, New Delhi.

----------. *Report of the High Level Expert Committee on Storage*, Ministry of Agriculture, GOI, New Delhi.

National Cooperative Development Corporation. *Annual Report 1994-2000*, New Delhi.

The Fertiliser Association of India. Fertiliser Statistics - 2000, New Delhi.

Annexure I

Agricultural Workers

Year	Total Population (million)	Annual Compound Growth Rate (percent)	Rural Population (million)	Workers[a]			
				Cultivators	Agricultural Laborers	Other Workers	Total
1	2	3	4	5	6	7	8
1951	361.1	1.25	298.6 (82.7)	69.9 (49.9)	27.3 (19.5)	42.8 (30.6)	140 (100.0)
1961	439.2	1.96	360.3 (82.0)	99.6 (52.8)	31.5 (16.7)	57.6 (30.5)	188.7 (100.0)
1971	548.2	2.22	439.0 (80.1)	78.2 (43.4)	47.5 (26.3)	54.7 (30.3)	180.4 (100.0)
1981[b]	683.3	2.2	523.9 (76.7)	92.5 (37.8)	55.5 (22.7)	96.6[c] (39.5)	244.6 (100.0)
1991[d]	846.3	2.14	628.7 (74.3)	110.7 (35.2)	74.6 (23.8)	128.8[c] (41.0)	314.1 (100.0)
2001[e]	1,012.4	1.79					
2006[e]	1,094.1	1.55					

Source: Registrar General of India.

Notes: [a] Figures in parentheses represent percentage to the total; [b] total and rural population of India in columns 2 and 4 includes population of Assam worked out by interpolation as 1981 Census could not be held in Assam due to disturbed conditions. The data on workers in columns 5-8 excludes Assam; [c] includes marginal workers; [d] total and rural population of India in columns 2 and 4 includes the projected population figures of Jammu and Kashmir (J&K) as 1991 Census could not be conducted in J&K due to disturbed conditions. The data on workers in columns 5-8 excludes J&K; and [e] population projections for India and States 1996-2016 are based on report of the Technical Group on Population Projections constituted by the Planning Commission, August 1996.

Annexure II

Agricultural Perspective

Variable	1991-92	1996-97	Projected	
			2001-02	2006-07
Land (million ha)				
Net sown area	140	142	142	142
Gross cropped area	182.2	190.6	197.2	203.4
Food grains	127	130	132.6	135
Irrigation (million ha)				
Food grains	53.8	62.3	70.2	77.7
Other than food grains	21.9	27.0	31.8	36.3
Total	75.7	89.3	102.0	114.0
Fertilizer (million mt)				
Food grains	9.4	12.8	16.6	21
Other than food grains	4.1	5.5	7.1	9
Sub-total	13.5	18.3	23.7	30
Cotton (million bales)	10.5	14	18.0[a]	23.0[a]
Sugarcane (million mt)	235	275	335.0[b]	408.0[b]
Food grain (million mt)	172.5	210	245	285
Oilseeds (million mt)	17.5	23	29.0[c]	37.0[c]

Notes: [a] 5 percent per annum; [b] 4 percent per annum; and [c] 5 percent per annum.

5. INDIA (2)

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INTRODUCTION

India is predominantly an agrarian society. Agriculture is a way of life, a tradition, which, for centuries, has shaped the thought, the outlook, the culture and the economic life of the people of India. Agriculture, therefore, is and will continue to be central to all strategies for planned socioeconomic development of the country. Rapid growth of agriculture is essential not only to achieve self-reliance at national level but also for household food security and to bring about equity in distribution of income and wealth resulting in rapid reduction in poverty levels.

Over 200 million Indian farmers and farm workers have been the backbone of India's agriculture (Table 1). Indian agriculture has, since Independence, made rapid strides. In taking the annual food grain production from 51 million mt in the early 1950s to 209 million mt at the turn of the century, it has contributed significantly in achieving self-sufficiency in food and in avoiding food shortages in our country. Despite having achieved food security at the macro level, the well-being of the farming community continues to be a matter of concern for the planners and policymakers. The pattern of growth of agriculture has brought in its wake uneven development, across regions and crops as also across different sections of the farming community and is characterized by low levels of productivity and degradation of natural resources in some areas. Capital inadequacy, lack of infrastructural support and demand-side constraints, such as controls on movement, storage and sale of agricultural products, have continued to affect the economic viability of the agriculture sector. Consequently, the growth rate of food grain production has also tended to slacken during the 1990s (Tables 2 and 3). The growth rate of GDP related to agriculture has also shown a declining trend (Annexure I).

Agriculture has become a relatively unrewarding profession due to the generally unfavorable price regime and low value addition, causing abandoning of farming and increasing migration from rural areas. The situation is likely to be exacerbated further in the wake of WTO and integration of agricultural trade in the global system, unless immediate corrective measures are taken. Thus, the support services for agriculture seek to actualize the vast untapped growth potential of Indian agriculture in terms of productivity and diversification, strengthening rural infrastructure to support faster agricultural development, promoting value addition, accelerating the growth of agro-business, creating employment in rural areas, securing a fair standard of living for the farmers and agricultural workers and their families, discouraging migration to urban areas and facing the challenges arising out of economic liberalization and globalization. Over the next two decades, the country aims to attain:

* growth rate in excess of 4 percent per annum in the agriculture sector;
* growth that is based on efficient use of resources and conserves soil, water and biodiversity;
* growth with equity, i.e., growth which is widespread across regions and farmers;
* growth that is demand-driven and caters to domestic markets and maximizes benefits from exports of agricultural products in the face of the challenges arising from economic liberalization and globalization; and
* growth that is sustainable technologically, environmentally and economically.

Source: National Agriculture Policy, 2000, Ministry of Agriculture, Government of India.

Table 1. Population and Agricultural Workers

(Unit: Million)

Year	Total Population (million)	Average Annual Exponential Growth Rate (percent)	Rural Population (million)	Cultivators	Agricultural Laborers	Other Workers	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1951	361.1	1.25	298.6	69.9	27.3	42.8	140.0
			(82.7)	(49.9)	(19.5)	(30.6)	(100.0)
1961	439.2	1.96	360.3	99.6	31.5	57.6	188.7
			(82.0)	(52.8)	(16.7)	(30.5)	(100.0)
1971	548.2	2.20	439.0	78.2	47.5	54.7	180.4
			(80.1)	(43.4)	(26.3)	(30.3)	(100.0)
1981[a]	683.3	2.22	523.9	92.5	55.5	96.6[b]	244.6
			(76.7)	(37.8)	(22.7)	(39.5)	(100.0)
1991[c]	846.3	2.14	628.7	110.7	74.6	128.8[b]	314.1
			(74.3)	(35.2)	(23.8)	(41.0)	(100.0)
2001[d]	1,027.0	1.93					

Source: Registrar General of India, New Delhi.

Notes: Figures in parentheses represent percentage to the total.

[a] Total and rural population of India in columns 2 and 4 includes population of Assam worked out by interpolation as 1981 Census could not be held in Assam due to disturbed conditions. The data on workers in columns 5-8 exclude Assam; [b] includes marginal workers; [c] total and rural population of India in columns 2 and 4 includes the projected population of Jammu and Kashmir (J&K) as 1991 Census could not be conducted in J&K due to disturbed conditions. The data on workers in columns 5-8 exclude J&K; and [d] provisional.

INSTITUTIONAL FRAMEWORK

The Government of India, through the Ministry of Agriculture, spearheads the task of formulating and achieving the policy goals. While the Central Government provides the policy guidelines at the macro level, it is the State governments, who give shape to the entire agricultural development and support programs. The organizational setup in the Center and the States, may be graphically depicted in Figure 1.

The flow of funds and inputs in cash or kind, is from top to bottom. There is hardly any planning from the village level and most often than not, local bodies are not involved in this task. The monitoring of program starts from the bottom, with the village assistants having to maintain a record of multiple program inputs and send them to the state or center, as the case may be. The role of private sector or NGOs is quite limited in terms of support services provided to small farmers.

COOPERATIVE INSTITUTIONS

The basic support to agriculture has been provided by the cooperative sector assiduously built over the years. The cooperatives have been developed from the village to the State and national level. The government provides active support for the promotion of cooperative-form of enterprise. The funds flow from National Bank for Agriculture and Rural Development (NABARD) down the line depending upon the projects posed by the cooperatives (Figure 2).

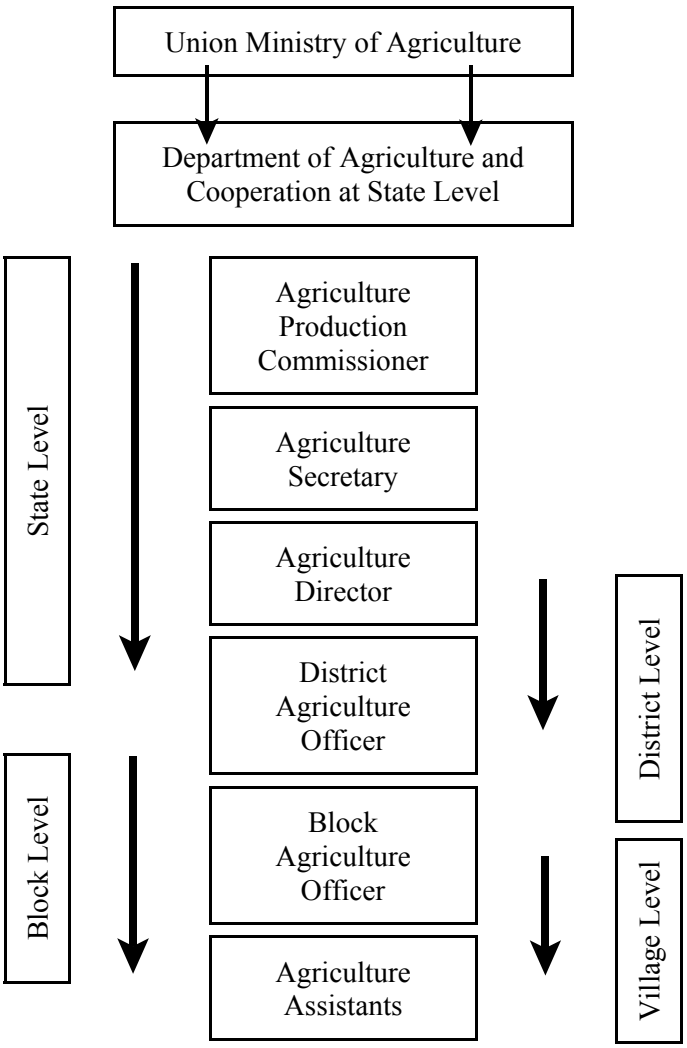

Figure 1. Organizational Setup in the Center and the States

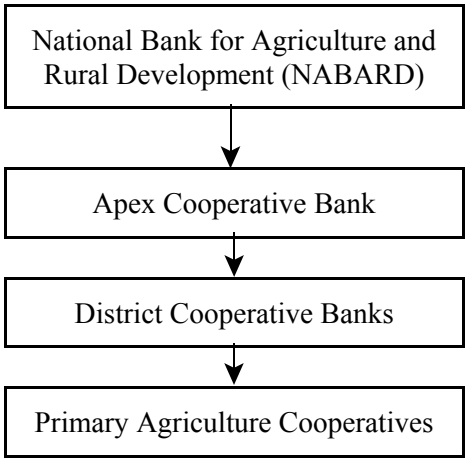

Figure 2. Fund Flow from NABARD

The country has been divided into three zones, i.e., most developed, moderately developed and least developed States in terms of their stages in development of cooperative movement. National and regional

level institutions have been set up to provide training in cooperative values, ethics and management of accounts and business to its members and functionaries.

ANAND, a national level cooperative comprising of milk producers is the most successful example of value addition and income generation of small farmers. Yet, all is not well with the cooperative structure in India. The State cooperative bank gets credit from NABARD at 7 percent rate of interest but the farmer in the village gets at the rate of 12-14 percent due to the overhead costs incurred at the State, district and village level. Besides the cooperatives today are highly politicized and non-professional in their approach. Hence, majority of farmers as well as cooperatives have become defaulters due to certain lacunae in the support systems and the high rate of interest, which is not commensurate with their rate of returns.

Special measures have to be taken for revamping of cooperatives to remove the institutional and financial weaknesses and for evolving simplified procedures for sanction and disbursement of agricultural credit. Structural reforms for promoting greater efficiency and viability by freeing them from excessive bureaucratic control and political interference; creation of infrastructure and human resource development; improvement in financial viability and organizational sustainability of cooperatives; democratization of management and increased professionalism in their operations; and creating a viable interface with other grassroots organizations, has to be high on the agenda of government.

ISSUES IN DELIVERY OF SUPPORT SERVICES FOR AGRICULTURE

Agriculture is predominantly a private enterprise. Government can only play a catalytic role in ensuring that it becomes a remunerative and sustainable. The government endeavors to create a favorable economic environment for increasing capital formation and farmer's own investments in the priority sectors of agricultural growth. It seeks to bestow on the agriculture sector in as many respects as possible, benefits similar to those obtained in the manufacturing sector, such as easy availability of credit and other inputs, and infrastructure facilities for development of agribusiness industries and development of effective delivery systems and freeing movement of agro-produce. In a global perspective, it aims at exploiting its comparative advantages vis-à-vis other countries (Table 2). While NGOs have been partners in such services, private sector participation through research, contract farming and land leasing arrangements to allow accelerated technology transfer, capital inflow and assured markets for crops such as oilseeds, cotton and horticultural crops is yet to take shape.

Table 2. India's Position in World Agriculture during 1998

Item	India	World	Percent Share	India's Rank	Position Next to
Area[a] (million ha)					
Total area	329	13,387	2.5	Seventh	Canada, U.S.A., China, Brazil, Australia, Russian Federation
Land area	297	13,048	2.3	Seventh	U.S.A., China, Canada, Brazil, Australia, Russian Federation
Arable land	162	1,379[b]	11.8	Second	U.S.A.
Irrigated area	57	268[b]	21.3	First	
Population (million)					
Total	982	5,901	16.6	Second	China
Agriculture	549	2,565	21.4	Second	China
Economically Active Population (million)					
Total	429	2,865	15.0	Second	China
Agriculture	260	1,308	19.9	Second	China

... To be continued

Continuation

Item	India	World	Percent Share	India's Rank	Position Next to
Crop Production (million mt)					
(A) Total cereals	219	2,054	10.7	Third	China, U.S.A.
Wheat	66	589[c]	11.2	Second	China
Rice (paddy)	122	563[c]	21.7	Second	China
Coarse grains	31	902	3.4	Third	U.S.A., China
(B) Total pulses	14	57[b]	24.6	First	
(C) Oilseeds					
Groundnut	8	31[c]	25.8	Second	China
Rapeseed	5	34[c]	14.7	Third	Canada, China
Fruits and Vegetables (million mt)					
(A) Vegetables[d]	56	606[b]	9.2	Second	China
(B) Potatoes	25	296[b]	8.5	Fourth	China, Russian Federation, Poland
(C) Onion (dry)	4	40[b]	10.0	Second	China
(D) Fruits[e]	38	435[b]	8.7	Second	China
Commercial Crops (million mt)					
(A) Sugarcane	265	1,252	21.2	Second	Brazil
(B) Tea	0.87	2.96	29.4	First	
(C) Coffee (green)	0.23	6.46[c]	3.6	Seventh	Brazil, Colombia, Indonesia, Mexico, Ethiopia, Vietnam
(D) Jute and jute-like fibers	1.74	3.60[b]	48.3	First	
(E) Cotton (lint)	2.72	18.26[c]	14.9	Third	U.S.A., China
(F) Tobacco leaves	0.64	7.06[c]	9.1	Third	China, U.S.A.
Livestock (million heads)					
(A) Cattle	209	1,318[b]	15.9	First	
(B) Buffaloes	92	162[b]	56.8	First	
(C) Camels	1.03	19.08[b]	5.4	Fifth	Somalia, Sudan, Mauritania, Pakistan
(D) Sheep	56	1,064[b]	5.3	Third	Australia, China
(E) Goats	121	700[b]	17.3	Second	China
(F) Chicken	343	13,478[b]	2.5	Seventh	China, U.S.A., Brazil, Russian Federation, Mexico, Indonesia
Animal Products					
(A) Total milk (000 mt)	68,044	544,180[b]	12.5	Second	U.S.A.
(B) Eggs total (million)	1,612	53,129[b]	3.0	Fifth	China, U.S.A., Japan
(C) Total meat (000 mt)	4,589	216,201[b]	2.1	Sixth	China, U.S.A., Brazil, France, Germany
Implements (000)[a]					
Tractors-in-use	1,450	26,335[b]	5.5	Fourth	U.S.A., Japan, Italy

Source: FAO Production Yearbook, 1998.

Notes: [a] Figures relate to 1997; [b] FAO estimates; [c] unofficial figures; [d] including melons; and [e] excluding melons.

The major activities undertaken by the government to support agricultural development and the limitations thereof, are discussed in the following sections. An attempt has been made to analyze the issues and provide meaningful suggestions which can considerably improve the delivery and quality of support services to the farmers.

Planning

The government provides plan funds for centrally-sponsored schemes (Annexure II), in a lump sum grant under the Macro-management Scheme. The budgetary support for the Ninth Five-Year Plan (1997-2001) is given in Table 4. In 2001-02, an amount of Rs.8,100 million has been provided to the States for implementation of their work plans (Table 5). Each State prepares its work plan based on its needs and priorities. A regionally differentiated strategy is pursued, taking into account the agronomic, climatic and environmental conditions to realize the full growth potential of every region. The regionalization of agricultural research, based on identified agro-climatic zones, is a step in this direction. The central sector schemes on the other hand provide thrust to the national level priorities, such as Technology Mission for Oilseeds, where the country faces demand supply gap or can earn/save substantial foreign exchange. Besides, conservation and optimization of natural resources and census collection, etc. are some other functions managed at the national level.

1. ***Limitations***

Since regional level planning for agricultural development is taking place at the macro level, the micro-level planning inputs are not reaching the farmers. For example, which crop would give the best yield based on the soil type, irrigation potential, climatic condition, etc., is not the basis of the cropping pattern followed by each farmer. In China, 'precision farming' is practiced through 'field level' soil-water analysis vis-à-vis the crop characteristics. In India, the soil testing laboratories are not functional, the technicians are not in place or the equipments are either inadequate or out of order. There is a lack of focus on productivity gains as an end result.

2. ***Suggestions***

Effective implementation of policy initiatives will call for comprehensive reforms in the management of agriculture by the Central and the State Governments. While government machinery is not able to cater to the micro-level demands, it is better to decentralize this support service through NGOs or *Panchayat Raj* institutions. A new scheme of promoting "Agriclinics" through agriculture graduates in 5,000 villages, to begin with, is in the offing. The Department has to initially provide them training and bank assistance to set up their ventures and run them in a viable manner. The Central Government should assume a role of advocacy, articulation and facilitation to help the States in their efforts towards achieving accelerated agricultural development. For example the digitized database on land use, drainage, watersheds, etc. should be made available to States/districts to enable them to prioritize their development plans in the most cost-effective manner.

Technology Dissemination

At present, 10 institutes under the Indian Council for Agriculture Research (ICAR), 10 national research centers and 16 All India coordinated research projects are engaged in crop improvement, production, protection and postharvest management. However, full advantage of research can be realized only through private partnership for value addition and export. The ICAR is engaged in systematic research on improved technology in plant material production, tissue culture, hybrid seeds, mechanization, etc. Similarly, Indian Institute of Science (IISc), Indian Institutes of Technology (IIT), Council for Scientific and Industrial Research (CSIR), Ministry of Non-conventional Energy Sources (MNES) and many other application-specific institutes are producing technological inventions, day in and day out. The Department of Agriculture subsidizes these technology inputs to promote their use in the field for example, use of drip irrigation, greenhouses, farm machinery, etc.

Table 4 (a). Disaggregated Public Sector Outlays/Expenditure under Agriculture and Allied Programs during Ninth Five-Year Plan (1997/98-2001/02)

Sl. No.	Head	1997-98		1998-99		1999-2000		2000-01*		2001-02*
		BE	Expenditure	BE	Expenditure	BE	RE	BE	RE	BE
1	2	3	4	5	6	7	8	9	10	11
1.	Crop husbandry	2,059	1,694	2,655	1,845	2,569	2,160	1,711	1,380	1,618
2.	Soil and water conservation	566	561	825	638	932	650	62	63	15
3.	Animal husbandry	451	340	495	326	525	399	136	77	139
4.	Dairy development	141	70	133	65	145	62	48	36	33
5.	Fisheries	341	284	397	291	410	323	125	117	120
6.	Forestry and wildlife	1,334	1,264	1,832	2,491	1,966	1,700	348	282	335
7.	Plantation	206	136	168	189	156	144	177	169	137
8.	Food storage and warehousing	122	117	108	29	136	123	161	143	128
9.	Agriculture, research and education	575	541	819	675	888	819	630	550	684
10.	Agricultural financial institutions	489	154	499	402	303	294	45	29	29
11.	Other agricultural programs	118	153	122	81	134	49	10	7	10
12.	Cooperation	573	616	635	660	632	508	169	128	133
Total agriculture and allied programs		6,975	5,930	8,688	7,692	8,796	7,231	3,622	2,981	3,381

Source: Planning Commission, New Delhi.
Note: * Only Center's share.

Table 4 (b). Details of Outlays Proposed by Department of Agriculture and Cooperation and Finally Approved by the Planning Commission/Ministry of Finance for the Ninth Five-Year Plan

(Unit: Rs. million)

Sl. No.	Name of Division	Ninth Plan Outlay Proposed	Outlay Approved by Planning Commission/ Ministry of Finance
1.	Agricultural Census	565.0	480.0
2.	Cooperation	13,624.5	7,650.0
3.	Credit	50,784.9	16,338.5
4.	Crops	13,530.0	12,798.2
5.	Extension	4,210.0	1,800.0
6.	Fertilizer	1,869.7	1,675.0
7.	Agricultural Implements and Machinery	10,520.0	960.0
8.	Horticulture	23,800.0	12,980.0
9.	Plant Protection	5,039.0	1,225.1
10.	Rainfed Farming System	15,950.0	10,300.0
11.	Seed	1,382.5	1,308.0
12.	Directorate of Economic and Statistics and Commission for Agricultural Costs and Prices (CACP)	3,621.6	2,440.0
13.	Soil and Water Conservation	16,563.4	8,916.2
14.	Technology Mission on Oilseeds and Pulses (TMOP)	20,587.5	9,060.0
15.	Natural Disaster Management	140.0	400.0
16.	Trade (Small Farmers Agro-business Consortium) and International Cooperation	200.0	400.0
17.	Information Technology	0.0	1,800.0
18.	Secretariat Economic Services	150.0	150.0
19.	Plan Coordination (macro management)	0.0	30.0
20.	Agriculture Marketing	0.0	700.0
21.	Policy Division	0.0	127.2
Total		182,538.1*	91,538.2

Source: Ministry of Agriculture.

Note: * Outlay proposed by Department of Agriculture and Cooperation excluding Fisheries Division.

Table 5. Central Assistance Proposed to State Governments under Work Plans (state-wise allocation)

(Unit: Rs. million)

State/ Union Territory	Approved Outlay		Revised	State/ Union Territory	Approved Outlay		Revised
	2000-01	2001-02	2001-02		2000-01	2001-02	2001-02
Andhra Pradesh	450.0	600	450	Kerala	400.0	660	400
Arunachal Pradesh	70.0	128	70	Madhya Pradesh	444.2	870	500
Assam	116.0	200	150	Chattisgarh	155.8	-	170
Bihar	131.9	200	150	Maharashtra	1,001.0	1,200	1,000
Jharkhand	90.0	-	100	Manipur	100.0	200	100
Goa	18.0	30	20	Mizoram	60.0	100	60
Gujarat	300.0	400	400	Meghalaya	95.0	120	100
Haryana	150.0	250	150	Nagaland	120.0	200	120
Himachal Pradesh	150.0	360	180	Orissa	350.0	500	330
Jammu and Kashmir	150.0	430	180	Punjab	250.0	300	230
Karnataka	650.0	800	650	Rajasthan	700.0	850	800

... To be continued

Continuation

State/ Union Territory	Approved Outlay		Revised	State/ Union Territory	Approved Outlay		Revised
	2000-01	2001-02	2001-02		2000-01	2001-02	2001-02
Sikkim	80.0	180	80	D&N Haveli	25.0	36	30
Tamil Nadu	500.0	600	500	Delhi	30.0	35	30
Tripura	80.0	210	80	Lakshadweep	12.0	14	20
Uttar Pradesh	758.0	900	760	Pondicherry	20.0	30	30
Uttarachal	92.0	300	100	Daman and Diu	8.0	10	10
West Bengal	120.0	160	150	A&N Island	18.0	25	20
Chandigarh	8.0	9	10	Total	7,547.1	10,907	6,310

Source: Ministry of Agriculture.

1. ***Limitations***

The funds with the government being scarce, the promotion of technology is thinly spread, and therefore its impact is also not highly visible. As technology requires certain amount of investment, the small and marginal farmers are not able to adopt it in a big way. The element of subsidy also puts them in a long wait for their turn to get the benefit. Thus, it is usually the big farmers who reap the benefit of research funded by the public or private sector. The Green Revolution in Punjab in the 1960s was an exception because most farmers in the State went in for the mechanization of agriculture in a big way. Those who could not afford to buy the equipments could access them on rent, in view of the higher returns generated. Most of the technological innovations are not 'demand-driven'. The farmer groups are not organized enough to sponsor crop or area-specific technology. The technology sought to be popularized by government, across the length and breadth of the country may not be uniformly feasible. The cost-benefit ratio is normally not kept in mind by the scientists working in isolated laboratories, remotely placed from the field conditions.

2. ***Suggestions***

A well-organized, efficient and result-oriented agricultural research and education system could introduce the desired technological changes in Indian agriculture. Application of science and technology in agriculture has to be promoted through a regular system of interface between these institutions and the users/ potential users, to make the sector globally competitive. Application of frontier sciences like biotechnology, remote sensing technologies, pre/postharvest technologies, energy saving technologies, technology for environmental protection through national research system as well as proprietary research needs to be encouraged. The technology developed should be demand-driven, farm- and crop-specific. Besides, technologies can play their role effectively only if other inputs are also simultaneously ensured.

Research, Extension and Training

Research is the domain of the ICAR and State agricultural universities, while extension is carried out by the departments of agriculture, at State and central level. The two departments being different administrative entities require periodic interface and coordination to reach the benefits to the farmers and their fields. The government schemes subsidize the prescribed package of practices or input varieties for a small number of farmers, year after year. The 'front-line field demonstrations' are also sponsored by the government to produce a 'demonstration effect' in the village. Assistance to NGOs is provided for various pilot projects on extension and training. The farmers are expected to adopt the successful models in a big way.

1. ***Limitations***

The present extension system is neither farmer-responsible nor farmer-accountable. The two wings of research and extension lack proper coordination. The budget is also very limited to meet all the needs of the farmers in problem areas such as pest control, productivity decline, etc. The services being free of cost, farmers have no stake in their optimum utilization. The present agricultural extension system is highly compartmentalized and mainly focuses on information gathering rather than information sharing. The major duty of the Agriculture Assistant is to prepare as many reports as there are programs, collect statistics,

maintain records of subsidies/inputs disbursed, leaving very little time for training and organizing the farmers. Thus, Training and Visit (T&V) system has now become a misnomer.

2. ***Suggestions***

The research and extension linkages, if strengthened could improve its quality and effectiveness. The extension system needs to be broad-based and revitalized in terms of its orientation towards uniformity in education standards, women empowerment, user-orientation, vocationalization and promotion of excellence. The role of Krishi Vigyan Kendras (KVKs), NGOs, farmers' organizations, cooperatives, corporate sector and para-technicians in organizing demand-driven production systems needs to be encouraged. The new agricultural extension system will have to meet the needs of "information hungry" farmers. A private extension system can be run by a group of young agricultural professionals having adequate training in information technology. They should act as a two-way channel for communicating with the farmers and getting their feedback. This can be taken up as a "venture capital" exercise by enterprising professionals. The monthly subscription from the farmers should follow "use now and pay later" concept. The private extension should complement government effort in fine-tuning the supply and services demanded by the enlightened farming community.

Management of Inputs

Adequate and timely supply of quality inputs such as seeds, fertilizers, plant protection chemicals, biopesticides, agricultural machinery and credit at reasonable rates to farmers has been the endeavor of the government. Presently, National Seeds Corporation (NSC) and State Farms Corporation of India (SFCI) and State seed cooperative agencies provide a major source of seeds to the farmers. Government subsidizes the fertilizer manufacturers to ensure affordability and availability of fertilizers to the farmers. Banks and cooperatives provide short- and long-term credit to the farmers, through a recently introduced scheme of *Kisan* passbooks, which act as credit cum insurance cards.

1. ***Limitations***

The common complaint of the farmers is the non-availability of good quality seeds and fertilizers, as and when required by them. Although there is a regulatory mechanism in place, both at the central and the State levels, the sale of spurious fertilizers and non-certified seeds is quite common. Farmers take short-term loans to provide these inputs to their fields but are unable to earn profits to repay their debts. Thus the vicious circle of poverty perpetually engulfs the rural peasantry.

2. ***Suggestions***

Development, production and distribution of improved varieties of seeds and planting materials and strengthening and expansion of seed and plant certification system with private sector participation is urgently needed. The departmental inspectors need to be more vigilant and deterrent action against unethical trading has to be taken. A time-bound strategy for rationalization and transparent pricing of inputs will have to be formulated to encourage judicious input use and to generate resources for agriculture. Input subsidy reforms have to be pursued as a combination of price and institutional reforms to cut down costs of these inputs for agriculture.

Availability of Credit

Progressive institutionalization of rural and farm credit is promoted for providing timely and adequate credit to farmers. The regional rural credit banks are geared to promote savings, investments and risk management. Micro-credit is also an effective tool for alleviating poverty. Sub-sector-wise and agency-wise share of agriculture credit is given in Tables 6 and 7, respectively for the years 1997-2000. Twenty-four-percent credit is reserved as 'priority sector' lending by commercial banks for agriculture sector, and the unspent balances are credited to a Rural Infrastructure Development Fund (RIDF), maintained by NABARD to advance funds to the States to build rural infrastructure. The endeavor is to ensure equity in the disbursement of credit across different sectors of economic growth.

Table 6. Sub-sector-wise Ground Level Credit for Agriculture and Allied Activities, 1997/98-1999/2000

(Unit: Rs. million)

Sr. No.	Sector	1997/98	1998/99	Growth Rate (percent)	1999/2000	Growth Rate (percent)
I.	Crop Loan	206,400	239,030	15.8	272,390	14.0
II.	Investment Credit/Term Loan (medium/long-term)					
	1. Minor irrigation	15,840	17,900	13.0	21,420	19.7
	2. Land development	1,730	2,170	25.4	2,750	26.7
	3. Farm mechanization	35,660	39,360	10.4	43,590	10.7
	4. Plantation and horticulture	7,550	7,670	1.6	8,680	13.2
	5. Animal husbandry[a]	17,630	19,960	13.2	23,660	18.5
	6. Fisheries	3,380	4,480	32.5	5,080	13.4
	7. Others[b]	31,370	38,030	21.2	40,070	5.4
	Sub-total	113,160	129,570	14.5	145,250	12.1
Grand total		319,560	368,600	15.3	417,640	13.3

Source: Ministry of Agriculture.

Notes: [a] Animal husbandry includes dairy development, poultry, sheep, goat and piggery; and [b] others include disbursements under storage/market yard, bullock and bullock carts, biogas, hi-tech agriculture, etc.

1. ***Limitations***

The bankers financing agricultural credit do not necessarily have an appreciation of project viability from an agriculture professional's point of view. They normally appraise it purely with a financial perspective and release the loan if only their sureties or securities are taken care of. A large number of farmers being defaulters for different reasons are debarred from this facility forever. Hence, credit reaches those who can afford and not others who end up in the moneylender's trap. Besides, most of the funds earmarked for priority sector lending remain under utilized, leaving agriculture sector as impoverished as ever.

2. ***Suggestions***

Self-help groups using bank linkage system, suited to Indian rural sector could be developed as a supplementary mechanism for bringing the rural poor into the formal banking system, thereby improving banks' outreach and the credit flows to the poor farmers in an effective and sustainable manner. A national system of warehouse receipts for the farmers' produce could be institutionalized in the commodity exchanges to improve credit flow, delivery and recoveries, through an integrated mechanism.

Water Management

The average annual rainfall of India is about 88 cm, which is the highest in the world for a country of comparable size. Yet, its irrigated area is only 37 percent and major chunk is characterized as rainfed area. Thus, management of its water resources in an optimum fashion is a thrust area of development. Special attention is also focused on water quality and the problem of receding groundwater levels in certain areas as a result of overexploitation of underground aquifers. Schemes for encouraging proper on-farm management of water resources for the optimum use of irrigation potential, use of *in situ* moisture management techniques such as mulching and use of micro overhead pressured irrigation systems like drip and sprinkler and greenhouse technology are in operation, for greater water use efficiency and improving productivity, particularly of horticultural crops. Emphasis on promotion of water harvesting structures and suitable water conveyance systems in the hilly and high rainfall areas for rectification of regional imbalances through participatory community irrigation management are expected to yield desired results in the long run.

Table 7. Agricultural Credit, Credit Flow, Growth Rate and Agency-wise Share

(Unit: Rs. billion)

Particulars/Agency	1996-97	Share (percent)	1997-98	Share (percent)	1998-99	Share (percent)	1999-2000	Share (percent)	2000-01	Share (percent)
Production (short-term) Credit										
Cooperative banks	93.28	54.9	108.95	52.8	125.71	52.6	146.48	50.8	175.98	56.8
Regional rural banks	11.21	6.6	13.96	6.8	17.10	7.1	25.17	8.7	24.12	7.8
Commercial banks	65.49	38.5	83.49	40.4	96.22	40.3	116.97	40.5	109.73	35.4
Sub-total (A)	169.98	100.0	206.40	100.0	239.03	100.0	288.62	100.0	309.83	100.0
Growth rate (percent)	+17		+21.4		+15.8		+20.7		+7.3	
Medium/Long-term Credit										
Cooperative banks	26.16	27.8	31.90	28.2	33.86	26.1	37.81	23.9	51.06	24.9
Regional rural banks	5.63	6.0	6.44	5.7	7.50	5.8	8.72	5.5	16.49	8.1
Commercial banks	62.34	66.2	74.82	66.1	88.21	68.1	111.97	70.6	137.22	67.0
Sub-total (B)	94.13	100.0	113.16	100.0	129.57	100.0	158.50	100.0	204.77	100.0
Growth rate (percent)	+25		+20.2		+14.5		+22.3		+29.2	
Short-, Medium/Long-term Credit										
Cooperative banks	119.44	45.2	140.85	44.1	159.57	43.3	184.29	41.3	227.06	44.1
Regional rural banks	16.84	6.4	20.40	6.4	24.60	6.7	33.29	7.5	40.61	7.9
Commercial banks	127.83	48.4	158.31	49.5	184.43	50.0	228.54	51.2	246.93	48.0
Grand Total (A + B)	264.11	100.0	319.56	100.0	368.60	100.0	446.12	100.0	514.60	100.0
Growth rate (percent)	+20		+21.0		+15.3		+21.0		+15.4	

Source: Ministry of Agriculture.

1. ***Limitations***

There are 3-4 different departments handling this subject, without much coordinated effort for utilization of scarce national resources, to the disadvantage of the farmer as well as the nation.

2. ***Suggestions***

Water management should be given a top priority, both at central and the State level. The watershed approach supported by scientific land use and drainage data developed by a centralized agency should form the core strategy of exploitation of water resources. Bridging the gap between irrigation potential created and utilized, completion of all ongoing projects, restoration and modernization of irrigation infrastructure including drainage, evolving and implementing an integrated plan of augmentation and management of national water resources should receive special attention for augmenting the availability and use of irrigation water.

Sustainable Agriculture

Sustainable development is a process of change in which the exploitation of resources, direction of investments, orientation of technological development and institutional changes, are all in harmony and enhance both current and future potential to meet human needs and aspirations. An ever-green revolution could be triggered by farming systems that can help produce more from the available land, water and labor resources, without ecological or social harm. Sensitization of the farming community to promote balanced and conjunctive use of biomass, organic and inorganic fertilizers and controlled use of agro-chemicals through integrated nutrients and pest management (INM and IPM) for enhancing productivity and returns from land, is taken up under different schemes. Farmers are being encouraged to take up farm/agro-forestry for higher income generation by evolving technology, extension and credit support packages. Involvement of farmers and landless laborers is being sought in the development of pastures/forestry programs on public wastelands, degraded and fallow lands by giving financial incentives and entitlements to the usufruct of trees and pastures.

1. ***Limitations***

Despite a plethora of extension workers, research institutions, credit and cooperative agencies, marketing societies, etc., the Indian farmer today is not in a position to make the soundest agro-economic decision. The total resource management of the country has not reached optimal and sustainable levels.

2. ***Suggestions***

Land and manpower being a limited resource, critical areas have to be identified and treated on priority. The following steps may be taken by the planners and administrators to usher in an 'ever-green' revolution:

1) Areas of shifting cultivation need particular attention for their sustainable development.
2) Management of land resources on watershed basis should be emphasized for integrated and holistic development of rainfed areas, which is nearly two-thirds of India's cropped area.
3) Rational utilization and conservation of the country's abundant water resources through conjunctive use of surface and groundwater.
4) The use of biotechnology has to be promoted for evolving plants, which consume less water, are drought-resistant, pest-resistant, contain more nutrition, give higher yields and are environmentally safe.
5) A time-bound program to list, catalogue and classify the country's vast agro-biodiversity to conserve indigenous breeds facing extinction.

Land Reforms

Indian agriculture is characterized by predominance of small and marginal farmers. Institutional reforms help channelize their energies for achieving greater productivity and production. The approach to rural development and land reforms includes the following areas:

* Consolidation of holdings all over the country on the pattern of northwestern States;
* Redistribution of ceiling surplus lands and waste lands among the landless farmers, unemployed youth with initial startup capital;

* Tenancy reforms to recognize the rights of the tenants and sharecroppers;
* Development of lease markets for increasing the size of the holdings by making legal provisions for giving private lands on lease for cultivation and agribusiness;
* Updating and improvement of land records, computerization and issue of land passbooks to the farmers; and
* Recognition of women's rights in land.

1. ***Limitations***

The average holding size of these farmers being about 1 ha makes it a very uneconomic unit of production. The Indian legal system being very complicated and expensive, ensures that the land reforms are not carried out with the desired speed and quality.

2. ***Suggestions***

The rural poor can be increasingly empowered to push the implementation of land reforms with the help of *Panchayat Raj* institutions, voluntary groups, social activists and community leaders.

Risk Management

Despite technological and economic advancements, the condition of farmers continues to be unstable due to natural calamities like droughts and floods and price fluctuations in the market economy. For this purpose, contingency agricultural planning, development of drought- and flood-resistant crop varieties, watershed development programs, drought-prone areas and desert development programs and rural infrastructure development programs are being run. Besides, "National Agriculture Insurance Scheme" covers all farmers and all crops throughout the country with built-in provisions for insulating farmers from financial distress caused by natural disasters and making agriculture financially viable. Endeavor is being made to provide a package insurance policy for the farmers, right from sowing of the crops to postharvest operations, including market fluctuations in the prices of agricultural produce.

1. ***Limitations***

The present risk management system is more 'curative' than 'preventive' in approach. The information systems governing the individual farmer's land, crop or credit particulars are still not in place. As a result, there is confusion as well as manipulation of data, whereby genuine sufferers are deprived of their due while unscrupulous elements carve prosperity out of disasters. Besides, funds available for this purpose are also very limited vis-à-vis the demand.

2. ***Suggestions***

A strong information network has to be brought into effect so that there is transparency and responsiveness in the administration of insurance/calamity relief. The database for the agriculture sector should be strengthened to ensure greater reliability of estimates and forecasting which will help in the process of planning and policymaking. Efforts have to be made to significantly improve and harness latest remote sensing and information technology to capture data, collate it, add value and disseminate it to appropriate destinations for managing the risk and in accelerating the growth process. The objective will be to engage in a meaningful continuous dialogue with the external environment in the changing scenario and to have a real time system of 'agriculture on line', with a capacity to analyze the signals emanating from the farms and the markets for the benefit of the farmers. Private/cooperative sector should be involved in the insurance sector for greater efficiency.

Minimum Support Prices

The Central Government discharges its responsibility to ensure remunerative prices for agricultural produce through announcement of Minimum Support Prices (MSP) for major agricultural commodities. Table 8 provides the rates fixed for procurement by the government and Table 9 lists out the quantities procured by government. The food, nutrition and other domestic and exports requirements of the country are kept in view by the CACP while determining the support prices of different commodities and arriving at estimates of costs of production. The price structure of both inputs and outputs is monitored to ensure higher returns to the farmers and bring about cost-effectiveness throughout the economy. Domestic market prices are closely monitored to prevent distress sales by the farmers.

Table 8. Minimum Support Prices (according to crop year)

(Unit: Rs. per 100 kg)

S. No.	Commodity	Variety	1996-97	1997-98	1998-99	1999-2000	2000-01
1.	Paddy	Common	380	415	440	490	510
		Fine	395	-	-	-	-
		Superfine	415	-	-	-	-
		Grade 'A'	-	445[a]	470	520	540
2.	Coarse cereals (jowar, bajra and ragi)		310	360	390	415	445
3.	Maize		320	360	390	415	445
4.	Wheat		475[b]	510[c]	550	580	
5.	Barley		305	350	385	430	
6.	Gram		740	815	895	1,015	
7.	Arhar		840	900	960	1,105	1,200
8.	Moong		840	900	960	1,105	1,200
9.	Urad		840	900	960	1,105	1,200
10.	Sugarcane[d]		45.9	48.45	52.7	56.1	59.5
11.	Cotton	F-414/H-777	1,180	1,330	1,440[e]	1,575[e]	1,625[e]
		H-4	1,380	1,530	1,650	1,775	1,825
12.	Groundnut-in-shell		920	980	1,040	1,155	1,220
13.	Jute		510	570	650	750	785
14.	Rapeseed/mustard		890	940	1,000	1,100	
15.	Sunflower seed		960	1,000	1,060	1,155	1,170
16.	Soybean	Black	620	670	705	755	775
		Yellow	700	750	795	845	865
17.	Safflower		830	910	990	1,100	
18.	Toria		855	905	965	1,065	
19.	Tobacco (VFC) (Rs./kg)	Black soil (F2 GR)	19.0	20.5	22.5	25.0	26.0
		Light soil (L^d Gr)	22.0	23.5	25.5	27.0	28.0
20.	Copra (calendar year)	Milling	2,500	2,700	2,900	3,100	3,250
		Ball	2,725	2,925	3,125	3,325	3,500
21.	Sesamum		870	950	1,060	1,205	1,300
22.	Niger seed		720	800	850	915	1,025

Source: Ministry of Agriculture.

Notes: [a] Classified into two categories for the MSP purposes instead of existing three varieties from *Kharif* season of 1997-98; [b] including a central bonus of Rs.60/100 kg payable up to 30 June 1997; [c] including a central bonus of Rs.55/100 kg payable from 1 April 1998 to 30 June 1998; [d] statutory minimum price linked to a basic recovery of 8.5 percent with proportionate premium for every 0.1 percent increase in recovery above that level; and [e] for J-34 variety also.

1. ***Limitations***

The present system of declaration of MSP is more political than scientific. The continuation of support price for rice and wheat is no more required for food security. It in fact sends wrong signals to the growers who desist from diversification and commercialization of production. Changing food habits across the world demand product diversification. However, the farmers take up commercial crops only if there is an assured market and a reasonable return. Since the government infrastructure for marketing neither provides online market information nor any marketing tie-ups, the growers do not wish to take the risk of diversification. Consequently, they continue growing food grains and cereals, where the MSP is known in advance. The surplus food grain production leads to lower market prices and government has to commit its resources to buy at MSP and later sell it at a loss. In 2000-01, an amount of Rs.160 billion was spent on procurement by Food Corporation of India. Instead this money could have been spent on providing necessary infrastructural support services.

Table 9. Procurement of Agricultural Commodities under Price Support Scheme (PSS)

Sr. No.	Commodity	1999-2000	2000-01 (as on 15 March 2001)
1.	Paddy/rice	17,274,000	15,127,000
2.	Coarse grains (cereals)	Negligible	457,000
3.	Wheat	14,143,000	16,355,000
4.	Milling copra	Negligible	218,814
	Ball copra	Negligible	4,063
5.	Soybean	494,418	54,660
6.	Sunflower seeds	21,241	44,252
7.	Mustard seeds	Nil	245,001
8.	Safflower seeds	Nil	6,610
9.	Groundnut	Nil	27,700
10.	Arhar (red gram)	Nil	100
11.	Cotton (bales)	7,874	Nil
12.	Tobacco	Nil	27

Source: Ministry of Agriculture.

2. ***Suggestions***

The system of declaring MSP should be done away with. The government should play a pivotal role in establishing future market and inviting private sector in providing backward and forward linkages through marketing tie-ups. The resources of government should be spent on supplying relevant information on price trends vis-à-vis cost of cultivation to enable the farmer to take a sound production and marketing decision.

Marketing Support

In a dynamic and growing economy, the agricultural marketing system provides important linkages between the farm production sector and the non-farm sector. It contributes to the commercialization of subsistence agriculture. Apart from transferring the goods from producer to the consumers, the marketing system also performs the function of discovering prices at different stages of marketing and transmitting the price signals in the marketing chain. Each State has a Directorate of Agriculture Produce Marketing (APMC), which facilitates setting up of decentralized and 'regulated' markets. As on 31 March 2001, there are 27,294 rural periodical markets, of which 7,161 have been regulated. The infrastructure is provided by APMCs to the farmers who bring their farm produce to these markets for sale. The arrivals and off take along with price information is compiled from these centers up to the national level by Agriculture Marketing Intelligence (AMI) Unit in the Ministry. A marketing information network is being set up at a cost of Rs.100 million for making real time data available, for domestic as well as international levels. Marketing interventions through public and cooperative agencies like National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) is carried out when the prices of any commodity fall below an optimum level (Table 10). The government proposes to enlarge the coverage of futures markets to minimize the wide fluctuations in commodity prices as also for hedging their risks. The endeavor will be to cover all important agricultural products under futures trading in course of time.

1. ***Limitations***

Market infrastructure in the country is more regulatory than facilitative. It provides no help in direct and free marketing, organized retailing, smooth raw material supplies to agro-processing, competitive trading, information exchange and adoption of innovative marketing technologies. The linkage between spot markets and future markets is poor due to domination of speculators. Marketing support provided by government is more reactive than proactive. As a result, most farmers dispose off their produce through middlemen/traders and do not get a reasonable price for their produce.

2. ***Suggestions***

Emphasis should be laid on development of marketing infrastructure and techniques of preservation, storage and transportation with a view to reducing postharvest losses and ensuring a better return to the

grower. The weekly periodic markets under the direct control of *Panchayat Raj* institutions need to be upgraded and strengthened for collection and dissemination of market intelligence. Direct marketing and pledge financing should be promoted rather than making it obligatory for the farmer to bring his produce to the *Mandi* for sale. A major role has to be played by farmers, consumers organizations, companies, partnerships, joint ventures, etc. The establishment of cold chains, provision of pre-cooling facilities to farmers as a service and cold storage in the terminal markets and improving the retail marketing arrangements in urban areas needs to be given a priority. Specialized markets for fruits and vegetables are urgently needed. Information-kiosks should be set up in the markets.

Table 10. Procurement of Agricultural Commodities under Market Intervention Scheme (MIS)

S. No.	Commodity	State	Quantity Approved for Procurement (mt)	Price Fixed (Rs.)
Year 1999-2000				
1.	Oil palm	Andhra Pradesh	65,000	2,750 /mt
2.	Onions	Maharashtra	65,000	250 /100 kg
3.	Oil palm	Karnataka	5,000	2,750 /mt
4.	Kinnow/malta/orange/galgal	Himachal Pradesh	200 (kinnow/malta/orange) 150 (galgal)	4.25 /kg (B grade) 3.65 /kg (C grade) 2.50 /kg
Year 2000-01				
1.	Kinnaur apples	Himachal Pradesh	16,000	10 /kg

Source: Ministry of Agriculture.

Infrastructural Development

Public sector investment has played a crucial role in development of infrastructure such as irrigation, electricity, agricultural research, roads, markets and communications. However, the share of Gross Capital Formation in Agriculture (GCFA) in the total Gross Domestic Capital Formation (GDCF) has declined sharply to 9.4 percent in 1996-97 from 19.1 percent in 1979-80. Government has been all through encouraging production of crops with a sole objective of achieving 'self-sufficiency'. Most of the resources have been consumed on the supply side, i.e., inputs or research delivery to individual farmers, that too without adequate monitoring. Very little has been done in infrastructural development in terms of backward and forward linkages, such as irrigation, soil testing laboratories, rural storage, cool chains, etc. for handling the produce efficiently and effectively. After the green revolution, blue revolution and yellow revolution, there is now emerging the "golden revolution" ushered through rapid production in horticulture sector. Horticulture crops cover 6.1 percent of the country's area, yet it received a fillip in terms of investment only in the Eighth and Ninth Five-Year plans. In the absence of proper facilities for value addition in horticulture crops, there is 30 percent wastage, which is more than what U.K. consumes every year. Present storage capacity is only 10 percent of the total fruit and vegetable production. In the next 10 years, 15,000 cold storages with an investment of Rs.270,000 million is envisaged. Besides, it is essential to integrate horticultural production with irrigation, food processing and postharvest facilities along with scientific farm level grading, packaging, etc. The Small Farmers Agro-business Consortium (SFAC) caters to the needs of farmer entrepreneurs and promotes public and private investments in agribusiness.

1. ***Limitations***

The agriculture sector has been starved of capital. There has been a decline in the public sector investment in the agriculture sector, particularly in infrastructure development.

2. ***Suggestions***

Public investment for narrowing regional imbalances, accelerating development of supportive infrastructure for agriculture and rural development particularly rural connectivity needs to be stepped up. Rural electrification will have to be given a high priority as a prime mover for agricultural development. The quality and availability of electricity supply needs to be improved to meet the demand of the agriculture

sector adequately, and in a reliable and cost-effective manner. The use of new and renewable sources of energy for irrigation and other agricultural purposes will also have to be encouraged.

Resource allocation regime has to be reviewed to re-channel the available resources from "support measures" towards "asset formation" in rural sector. Private sector investments in agriculture will have to be encouraged more particularly in areas like agricultural research, human resource development, postharvest management, agro-processing and marketing.

Collaboration between the producer cooperatives and the corporate sector will be encouraged to promote agro-processing industry. An interactive coupling between technology, economy, environment and society needs to be promoted for building up a substantial base for production of value-added agro-products for domestic and export markets with a strong emphasis on food safety and quality.

Addressing Globalization Issues

Indian economy has been relatively insular and this is particularly true of the agriculture sector. India's agricultural exports have ranged from 1.28 to 1.82 percent and imports from 1.81 to 3.12 percent of gross agricultural output. As on 1 April 2001, all restrictions on the movement of agricultural commodities across the countries have been dismantled. In order to protect the interest of farmers in the context of removal of quantitative restrictions, continuous monitoring of international prices is being undertaken and appropriate tariff protection is being provided. Commodity-wise strategies and arrangements for protecting the grower from adverse impact of undue price fluctuations in world markets and for promoting exports are being formulated through a recently announced scheme of "agri-export" zones being promoted by the Ministry of Commerce in consultation with the Department of Agriculture. Exports of horticultural produce and marine products could exploit the nation's comparative advantage. A twofold long-term strategy of diversification of agricultural produce and value addition to enable the production system to respond to external environment and creating export demand for the commodities produced in the country would provide incremental income to the farmers from export earnings.

1. ***Limitations***

There is lack of awareness about the issues involved in WTO and the Agreement on Agriculture. Most of the farmers' organizations are apprehensive of its impact on their source of livelihood. Their energies are being spent on government bashing rather than preparation to turn this challenge into an opportunity.

2. ***Suggestions***

A widespread awareness campaign on WTO has to be organized by the government. A favorable economic environment and supportive public management system will have to be created for promotion of agricultural exports. While import duties on manufactured commodities used in agriculture have to be rationalized, all controls and regulations hindering increase in farmers' income should be abolished to ensure that agriculturists receive prices commensurate with their efforts and investment. Quarantine, both of exports and imports, has to be given particular attention so that Indian agriculture is protected from the ingress of exotic pests and diseases.

The government will have to focus on "quality" aspects at all stages of farm operations from sowing to primary processing. The quality of inputs and other support services to farmers will have to be improved. Quality consciousness amongst farmers and agro-processors, facilities for grading and standardization of agricultural products for export enhancement, will need to be promoted.

ROLE OF NGOs AND PRIVATE SECTOR

There is need to take a closer look at the present situation of the agricultural support services provided by the government, NGOs or the private sector, particularly to the small farmers. In India, it is the government which plays a major role in this area. There has been a change in approach from schematic assistance to macro management approach while releasing funds from the Central Government to the States. It has also been found beneficial to encourage participatory approach as adopted in the watershed committees. Funds are also given to the NGOs to take up extension and capacity building activities in the villages. Private sector has excelled in input supplies such as hybrid seeds, supply of fertilizers, micronutrients, tissue culture, etc., but not without government regulations on quality. Only certain national priorities like production

of oilseeds, cotton, etc. have been retained by the Central Government to be run in a mission-mode approach. For example, India holds a premier position in oilseeds, accounting for 19 percent of global area and 9 percent of production. The TMOP has integrated the best of production, processing and storage technologies, both from public and private sector. In the last 13 years. i.e. 1985-98, production has more than doubled and so has the area. Nearly 52 percent of the increase was contributed by area expansion and 48 percent by productivity improvement. However, in the last two years due to cheap availability of imports and drought conditions, the area as well as productivity has declined. Fall in prices of edible oils by 35 percent in 1999, has brought into play the price elasticity of demand. This points at the insufficiency of agriculture support services. While providing MSP for such a high value crop, there is a need to effectively use instruments of trade or futures trading, to protect domestic produce. Besides, research has to focus on higher oil content and better quality standards to fetch better prices in international market.

The above example shows that no development program can be successfully implemented by any single agency on its own. There has to be coordination and complementarity in the approach of government, NGOs and private sector. The associations such as Indian Oilseeds Producers and Exporters Association (IOPEA), Soybean Processors Association (SOPA), Indian Maize Development Association (IMDA), etc. can play a very vital role in bringing about a strong linkage in the 'value chain' through crop-specific strategic alliances. It can ensure that the farmers produce the best quality commodity using appropriate inputs supported by need-based research and testing facilities, so that they are able to export and earn good returns.

It has been well acknowledged that information is a critical input for agricultural development just as credit, seed, nutrients and water and can be efficiently converted into economically rewarding opportunities. Also in the present day "privatization spree", it has been demonstrated again and again that private enterprises are far more efficient than government agencies in delivering goods and services. It is also well known that farmers do not hesitate to pay for valuable information, fail proof services and delivery mechanisms, if they get additional returns at the time of harvest.

Annexure I

Growth Rate of GDP Related to Agriculture, Forestry and Fishery at 1980-81 Prices

Year	Annual Growth	Year	Annual Growth
1981-82	5.91	1991-92	-2.34
1982-83	-1.22	1992-93	6.07
1983-84	10.81	1993-94	3.68
1984-85	-0.04	1994-95*	5.01
1985-86	0.29	1995-96*	-0.87
1986-87	-1.73	1996-97*	9.61
1987-88	0.37	1997-98*	-1.92
1988-89	16.33	1998-99*	7.16
1989-90	1.69	1999-2000*	1.30
1990-91	3.78		
Annual average growth from 1980-81 to 1990-91	3.62	Annual average growth from 1990-91 to 1999-2000	3.08

Source: Ministry of Agriculture.
Note: * At 1993-94 prices.

Annexure II

List of Centrally-sponsored Schemes

1. Assistance to Cooperative Weaker Section
2. Assistance to Women Cooperatives
3. Non-overdue Cover Scheme
4. Agricultural Credit Stabilization Funds
5. Special Scheme for Scheduled Castes/Scheduled Tribes
6. Integrated Cereal Development Programs in Rice-based Cropping System Areas
7. Integrated Cereal Development Programs in Wheat-based Cropping System Areas
8. Integrated Cereal Development Programs in Coarse Cereals-based Cropping System Areas
9. Special Jute Development Program
10. Sustainable Development of Sugarcane-based Cropping System Areas
11. Balanced and Integrated Use of Fertilizer
12. Promotion of Agricultural Mechanization among Small Farmers
13. Integrated Development of Tropical, Arid and Temperate Zone Fruits
14. Production and Supply of Vegetable Seeds
15. Development of Commercial Floriculture
16. Development of Medicinal and Aromatic Plants
17. Development of Roots and Tuber Crops
18. Development of Cocoa and Cashew
19. Integrated Program fo Development of Spices
20. Development of Mushroom
21. Use of Plastics in Agriculture
22. Beekeeping
23. National Watershed Development Project for Rainfed Areas
24. Scheme for Foundation and Certified Seed Production of Vegetable Crops
25. Soil Conservation in Catchments of River Valley Projects and Flood-prone Rivers
26. Reclamation and Development of Alkali Soils
27. State Land Use Boards

6. INDONESIA

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INTRODUCTION

Agricultural support services are associated with agricultural development, which is a part of national development. The aim of agricultural development in Indonesia is to achieve a balanced economic structure, where a growing industry is supported by strong agriculture. It is clear that in the long-term development program, sustainable development of agriculture is a desired objective.

The economic structure of Indonesia still relies on the agriculture sector, besides depending on oil and natural gas. To achieve the economic structure balance, some fundamental changes need to be effected. Continuous increase of agricultural production is required to fulfill the growing consumption requirement, need for raw materials for agro-industry, and demand for export. At a time when the agriculture sector is strong efforts should be made to provide impetus to the industry sector for faster growth. Export composition should be changed from raw material to processed commodities.

Agricultural support services are a major component in building a robust agriculture, which is able to optimize use of natural resources, power, technology and capital available to enhance the farmers' welfare. Agriculture can be used as vehicle to increase the economic growth rate. It must be supported by an improved farming community, strong economic institutions, synergistic relationship between rural communities, and effective agricultural support services.

Robust Agriculture

The population of Indonesia was about 203 million in 2000. Its annual growth rate is about 1.54 percent, with a density of 99 persons/km^2. There is uneven distribution among the islands and provinces. Java Island which only 6.9 percent of the total land area is inhabited by more than 114 million people, while Kalimantan which covers 28.1 percent are is occupied by 10.5 million people. In the last decade urbanization increased from 30.9 to 36.8 percent. It is predicted that the level of urbanization will increase to 44.4 percent in 2010. This rapidly changing demographic profile provides some idea about the problems of development, including those in the agriculture sector.

During the economic crisis the agriculture sector has proved its strength, although a part of it which depends upon imported inputs has been severely hit. There are at least four aspects related to farmers' robustness that should be considered:

1) Farmers should be able to optimize the use of all resources locally available, for the improvement of farmers' welfare, without causing any adverse effect to the environment. The use of imported inputs should be limited.
2) Agricultural activities by their very nature depend on natural conditions; however, farmers with the guidance of the government should be able to overcome constraints such as drought, flood, or pest outbreaks.

3) Farmers are flexible enough to adjust their production pattern and structure/depend and supply condition, and technology without the guidance from the government. Demand and supply balance is always changing in such a case farmers should be made aware about the changing directions so that they can take corrective measures.
4) Farmers should take active part in the development of their sector; managing their irrigation systems, adding value to their product and thereby creating more job opportunities.

INDONESIAN AGRICULTURE SYSTEM

Just as in other development sectors, Indonesian agriculture runs on a system based on natural and human resources as illustrated in Figure 1.

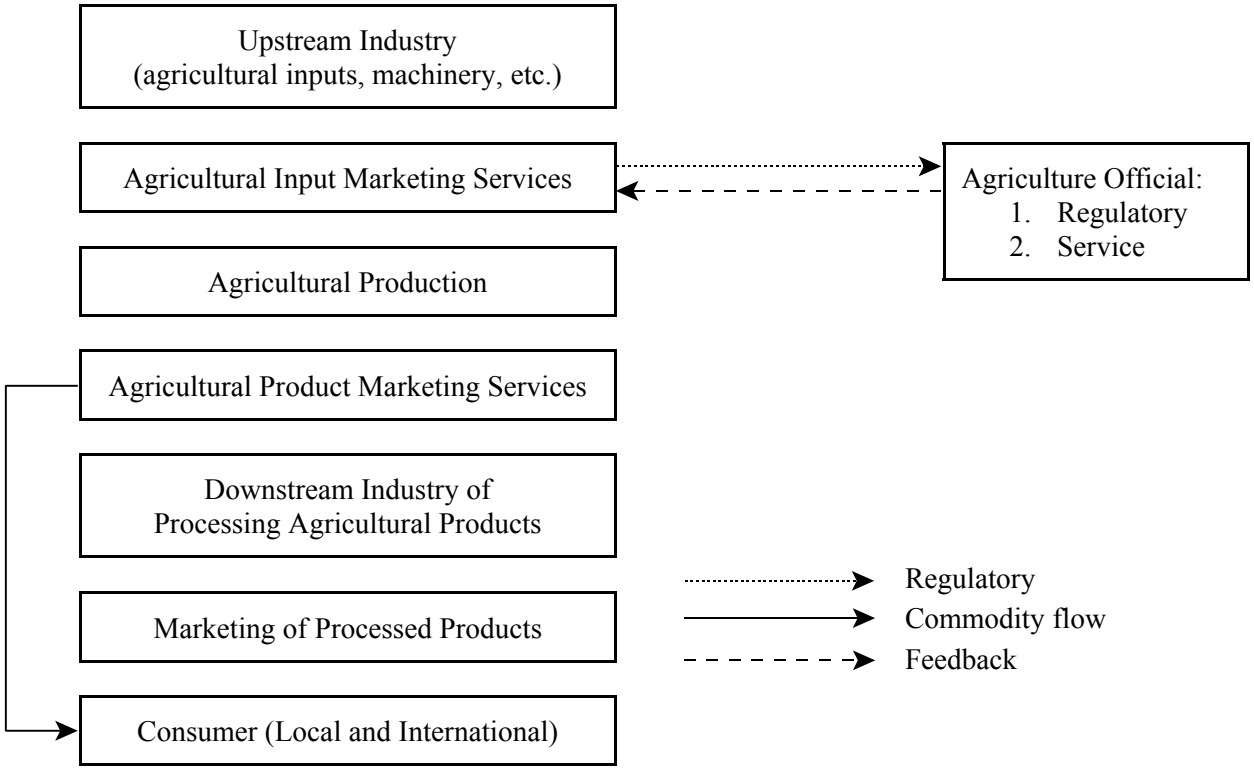

Figure 1. Indonesian Agriculture System

Agricultural production has backward linkage in the form of upstream industry, or agro-business, in organizing and distributing production inputs (pesticides, fertilizer, machinery, seeds, etc.) The forward linkage of agricultural production is downstream industry: postharvest processing and marketing of agricultural products to reach the consumers. This system is related with public consumption, to ensure demand for agricultural products – raw material or processed material. To create a robust agriculture all chains in the system must support one another.

There are four major agents in the agriculture sector: (1) farmers who undertake agricultural activity directly in the field; (2) government officials dealing with agriculture and infrastructure who guide farmers; (3) economic institutions; and (4) social institutions in the rural community. Each of these development agents should work cooperatively with other agents to optimize the results.

Agriculture Sector Objectives

There are three major agriculture sector objectives: (1) to stabilize food production to reach self-sufficiency; (2) to enhance export of agriculture products; and (3) to create job opportunities.

Stabilizing food production is carried out by integrated intensification, extensification, diversification, and rehabilitation in potential agriculture areas. Intensification is aimed at (1) enhancing the cropping

intensity of the existing agriculture area on dryland, rainfed or lowland; and (2) raising the product quality, especially in marginal areas. Extensification focuses on increasing the cultivated area by bringing new area under agriculture (coordinated with transmigration program or nucleus estate for instance). Diversification is aimed at broadening the variety of product, which may result in the decrease of rice consumption rate, substituted by an increase in protein consumption. Rehabilitation is promoted in order to ensure conservation of quality of land and water resources.

Exports are mainly from the plantation and fishery sub-sector. Some efforts to intensify and to extend those sub-sectors have been carried out since 1970s. However, about 86 percent of plantations are run inefficiently by small farmers. Small plantations have been supported by the government in order to increase their production and quality. The nucleus estate pattern is practiced.

Job opportunities will increase when intensification and extensification proceed, simultaneously together with capacity building of the community. Transmigration and resettlement programs provide considerable opportunities for employment generation.

Indonesian Agriculture Sector during the Economic Crisis

The economic boom in Indonesia was arrested for a while towards the end of 1997 when the crisis began. The dramatic increase of food production during the boom had provided the country the opportunity to reverse the trend from being the largest rice importer in the world to becoming self sufficient in 1984. The economic boom was based on very unstable basis, enormous debts, overvalued exchange rates, etc. Money from capital inflow to the economy was not used judiciously, it was spent to finance less productive goods. It was also used to finance capital-intensive industry – based primarily on imported inputs. The misallocation of resources led to the worst account deficit, making Indonesia and some other South Asian countries victims of the economic crisis. In short, it can be said that the economic crisis was the result of too rapid liberalization. High economic growth financed by foreign debt has led to instability in the economy, resulting in increase in poverty. BPS (Central Bureau of Statistics) reported that there was an increase of poor people to 79.4 million (1998) from 22.5 million in 1996, although some people argued that the figure was an overestimation of poverty. During the crisis economic activity decreased very rapidly; this was reflected in economic growth rate of -13.7 percent in 1998, compared with +4.6 percent in 1997. Since then political and social turmoil has also been triggered, there has been a strong movement to reform political structures, to eradicate corruption, collusion and nepotism. It is noteworthy, however, that among all sectors, agriculture has proved the most robust. This sector has registered positive growth due to the high dependence on imported inputs.

Demand for food products was not significantly influenced by the crisis. Facts show that demand for food is not something changeable. Some income reduction may arise from changes of demand from rice to inferior goods. On the other hand, exportable agricultural products have received a boost by the devaluation of the exchange rate. This situation explains how agriculture is the most robust sector against the crisis; urban areas suffer more than rural areas. Of course there is some kind of new balances between input-output. The increase in the use of agricultural inputs due to monetary depreciation, will be directly balanced by increase of income, although prolonged crisis will not allow any sector to thrive for long.

The crisis is not yet over. In future the agriculture sector should be repositioned as a main plank of the national economic structure.

SUPPORT SERVICES AND RELATED PROBLEMS

Food Fortitude

Act No. 7 of 1996 stipulates that government together with people is responsible to create food fortitude. Food fortitude is described as the fulfillment of food security to the level of household. It depends on: (1) adequate supply to meet the demand in quantity and quality; (2) secure distribution; (3) equity; and (4) access. It is also mentioned in the directives 1999-2004 that food fortitude development be based on diversified food resources, local culture and institutions, food and nutrition supply in quantity, quality, and at affordable price, to ensure farmers' welfare. By Act No. 25 of 2000, food fortitude program has been regulated. The government is responsible for the regulation, guidance, control, and monitoring of food

supply, and the community is responsible for carrying out the production process, marketing, distribution, and as consumer they are entitled to get safe food.

Learning from the economic crisis, food fortitude has been directed to: (1) the increase of food production in the form of carbohydrate sources (rice and non-rice) and protein; (2) the increase of non-rice food consumption to balance the decrease of the rice consumption per capita; (3) development of the food distribution system to make it more accessible; (4) development an instititonal arrangement that involves community participation; (5) development of food household fortitude; (6) development of food production and its quality in line with income increase of farmers; (7) decrease in imported food product; (8) development of agricultural product-based industry; and (9) enhancement of private investment in agricultural development. This needs strong support from small farmers. Therefore, efforts should be made to develop efficient support services for them.

Support Services Policy

Agricultural support as a part of national agricultural development involves a series of systematic communication with farmers. The policy on agricultural support services is based on some basic principles: (1) to optimize the use of local resources, i.e., natural resources, human resources, culture, and applied local technology; (2) economic efficiency; and (3) distribution which relates to competitive market mechanism.

The objective of the support services is the creation of agricultural activity based on the optimal, efficient and sustainable use of national resources. The mission is to enhance farmer empowerment to build food fortitude based on local resources, through system development and decentralized agro-business.

In fact the objective is to narrow the gap between the supply and demand of the farming community. Some operational efforts are:

1) empowering farmers to achieve their goals to cooperate with other institutions for the realization of the objectives based on the local resources, institution, and local culture;
2) raising agricultural production by creating a conductive climate for supply distribution sub-system;
3) supporting the community to build food fortitude;
4) enhancing agricultural input and output distribution system to stabilize market prices;
5) increasing food consumption diversification through local food product development and processed food to raise the quality of food consumption and to lower rice consumption;
6) developing joint management between agro-business and farmers, or within agro-businesses to support food fortitude, locally and nationally; and
7) increasing community (and government) sensitively to recognize and anticipate food scarcity.

However, the support services will be meaningful only when other measures such as irrigation, drainage, roads and transportation facilities have been addressed.

Act No. 22 of 1999 stipulates that responsibility be transferred to the local government to manage and regulate their issues, according to their capacity. This regional autonomy will influence the performance of the support services to small farmers.

Constraints

Agricultural development is supposed to provide enough food for the whole country, in proper quantity, place and time, and should be accessible as well. This requires harmony between various aspects of management, input-output, distribution, consumption, empowerment, and warning system. Problems encountered in these areas are as follows:

1. ***Managerial Aspects***

(a) Data related problems: missing/incomplete data, low accuracy, inconsistent, unreliable data.
(b) Macro and micro economic decisions do not benefit farmers and agricultural institutions. Applying commercial interest rate to agricultural activity will not be a good incentive to farmers. Similarly very high export tax on agricultural products would have a negative effect. On the other hand, government also applies high import tax for agricultural inputs.

(c) Low performance of development agents to implement agricultural development technically and managerially caused by limited knowledge and skill, bureaucratic problems, unavailability of standards.
(d) Government activities are more focused on on-farm development rather than inter sector development. Agricultural support services require more coordination between institutions to create sustainable activity, competitiveness, and decentralization.

2. ***Availability of Input-Output***

There were about 203 million people in Indonesia in the year 2000; and the population rate is about 1.35 percent a year. To meet the demand for agricultural support services, there are some problems:

(a) National production capacity is limited as a result of limited natural resources. Considerable land conversion is taking place to non-agricultural land; agricultural land is afflicted by problem of fertility decline and water scarcity, leading to water-use conflicts.
(b) Limited foreign exchange presents very little possibility of importing agricultural inputs. Within the next five years the obligation to repay foreign debt will be greater than ever leading to lowering support services.
(c) Farmers need to sell their product just after harvest to repay their debts made during the season. This results in low market prices due to flooding of the product. The only ones who benefit are the merchants and traders.
(d) Agro-product processing is not very common. It is costly and requires better technology.
(e) Modernization has created a more impersonal relationship among people. This is not conducive for agricultural support services.

3. ***Distribution Aspects***

(a) Support should be given to all farmers equally. Equality aspects are quite difficult to achieve because Indonesia consists of thousands of islands, and transportation facilities and infrastructure is not adequate affecting mobility both physical and economic.
(b) The regional inequality between areas cannot be easily wiped out due to distribution problems.
(c) Marketing institutions have not quite developed yet due to low capability and human resources problems. Their role in stablizing prices has not been very effective.

4. ***Consumption Aspects***

(a) Dealing with food consumption needs of more than 203 million people is not an easy task. Indonesia needs about 28.56 million mt of rice annually. This would make the provision of support services very challenging.
(b) In the past, the focus of agricultural support has been only on rice production. This decreases the opportunity for exploiting other food resource potentials. When focus is on diversification, support services also need to readjust.
(c) Some local people are still engaged in very traditional agriculture processes. They would not be able to compete with international products which have already flooded the market unless strong efforts are made to involve them in modern agriculture. The propensity of the urban community to buy imported goods worsens the situation.
(d) The consumption pattern is determined by knowledge, information flow, habit and culture. It is also affected by specific customs which treat the farmer unfairly. In order to make agricultural products accessible to everybody, it should be kept at low price.

5. ***Empowerment Aspects***

Community empowerment is very important to support food fortitude, so empowerment should cover all stakeholders: farmers, government officials, non-government institutions, consumers, universities, etc. However, the priority should be given to the poor and uneducated community.

(a) Low education and knowledge of farmers is the root of poverty; empowerment will be a difficult task.
(b) Managerial capability of the community institutions are weak.
(c) Government institutions as a primary engine of support services are trapped in sectoral-ego, leading to ineffective result.
(d) Farmers face limited access to technology; credit provision (due to collateral problem) and markets are limited also.

6. ***Warning System Aspects***

(a) Structural poverty which still exists in the rural areas is hindering farmers to achieve a better quality of life. It is something that should be taken into account in agricultural support services.

(b) Climatic hazards such as El Niño, or any other natural disaster, economic and political crisis leads to instability within the community. This would affect agricultural production.

Potentials

The country has exhibited potential to support a higher rate of agricultural development because of the following factors:

1) Indonesia has considerable unused natural resources. These can be utilized through application of modern technology.
2) Some local food resource areas are already developed in different regions of the country. These can be used as pilot projects for the surrounding areas.
3) Although modernization has still not spread everywhere, mutual cooperation among rural inhabitants is strong. Provision of local autonomy will enhance this kind of human relationship by developing local cultural identity.
4) Local autonomy will transfer responsibility to the local government who have better knowledge about local situations. This flexibility will enable them to deal with their constraints more effectively.
5) Advanced telecommunication system nowadays can be used to boost support to any remote area if the infrastructure is existing. Required data for the activity can be accessed more easily, promptly, and decision be taken quickly.
6) There is a growing awareness within rural people to improve the quality of life in their area, rather than to move to urban areas. This motivation can be an ignition for improving support services.

Support Services Targets

Support services that strengthen the food fortitude development program consist of the following targets:

1) Support to farmers to enhance food availability, based on minimum energy level of 2,550 kcal/capital/day and protein level of 5.5 gm/capita/day. Conditions in 1999 indicate a figure of 125 percent (available energy), and 119.5 percent (available protein).
2) Support for food distribution to ensure accessibility. In 1999 actual energy consumption was 85 percent, and protein consumption was 97 percent which shows that food distribution needs to be improved.
3) Support for efforts to stabilize agricultural input and output prices, spatially and temporally.
4) Enhancement of diversification of food to reduce dependency on just one item, namely; rice. The year 1999 shows that rice consumption declined to 124 kg/capita/year.
5) Raising community empowerment based on increasing the productivity and managerial capacity of the community, increasing of motivation of development agents, increasing adoption of applied technology, and improved credit provision and marketing.
6) Lowering the possibility of food scarcity by optimizing information system and community understanding on household food fortitude.

These targets can be achieved with the cooperation from different sectors: government institutions, non-government institutions, private sector and all communities local and national.

DEVELOPMENT STRATEGY AND PROGRAM

Strategy

To achieve the objective and targets of agricultural support services, there are some points which need to be considered:

1) Developing coordination systems between development agents and institutions and between regions to synchronize and bring about synergic activities in agricultural support services.
2) Enhancing farmer empowerment with a focus on households with emphasis on local resources and culture while recognizing that modern technology adoption is necessary.
3) Provision of agricultural support services should be the responsibility of all stakeholders, and government should be a facilitator.
4) Agricultural support system would have the following characteristics:
   (a) Highly competitive, with focus on innovation and technology, and a strong market orientation.
   (b) Democratically developed, involving all communities, with focus on small and middle farmers.
   (c) Sustainable, without adversely affecting the environment involving a equitable distribution of gains.
   (d) Decentralization of service supports to the rural areas, and to promote regional infrastructure.

Government's Role

To support agriculture, the role of governments must be to facilitate good/conducive conditions so that the community will be able to fulfil their responsibility. The government's role may be described as follows: (1) the implementation of macro and micro economic policy which benefits the farmers, rationalization of interest rates, exchange rates, taxes, infrastructures, law and regulations, and undertaking market operations when there is an emergency situation; (2) the improvement of national production capacity, through systematic development of agro-business optimizing resource use, efficient application of local technology, and developing economic infrastructure; (3) focusing attention on critical points of public services, such as product quality, market information, technology, credit, etc.; and (4) empowering farmers to enable them to take optimal decisions by improving farmers' institutions, transfer of technology, production facility and market access.

To achieve this role of the Central Government will be delegated to the local governments to the extent possible.

Organization and Program

Coordination of support services is undertaken by the Food Fortitude Support Services Board as provided in the *Keppres* (Presidential Decision) No. 41 of 2001. The Board aims to: (1) coordinate policy formulation in food fortitude (and support services); and (2) evaluate and control the implementation of food fortitude (and support services).

At the national, provincial and district level, the Board consists of all top government managers and institutions related to agricultural development. However, there must be some core teams who work on a daily basis to ensure smooth implementation of the program. The operational program includes coordination and management of food, aspects of food availability, distribution, farmers empowerment, and integrated development in rainfed areas.

1. ***Coordination Establishment Program***

This program consists of internal and external coordination involving management aspects, food availability development, distribution development, consumption development, and food fortitude.

(a) *Management aspects*: coordination of tasks and budgets, internal and external cooperation, data and reports, legal aspects and human relations, program analysis and evaluation.
(b) *Food availability development*: food balance analysis, production monitoring, export-import, stocks, formulation of development policy.
(c) *Distribution aspects*: pricing system analysis, distribution strategy, monitoring and evaluation of prices, formulation of pricing and distribution policy.
(d) *Consumption aspects*: consumption pattern analysis, analysis and development of local and traditional food resources.
(e) *Community food fortitude*: planning coordination, implementation and control of food production, development of community empowerment models.
(f) *Warning system aspects*: development of warning system information, coordination and analysis of scarcity protection.

2. ***Community Empowerment Program***

This program is aimed to empower community and government officials to implement support services:

(a) *Management aspects*: technical implementations, legal aspects, and human relations.

(b) *Food availability development*: institutional model development, institutional strengthening for food availability.

(c) *Distribution aspects*: development of trade system for strategic food availability, and institutional strengthening for food distribution.

(d) *Consumption aspects*: joint operation with food processing industry, community empowerment for food diversification, food diversification campaign.

(e) *Community food fortitude development*: farmers' empowerment to undertake agricultural activities, provision of agricultural inputs, credit and technology, stimulate motivation and participation for increasing efficiency, setting up of food fortitude award, development of the village food stock.

(f) *Warning system aspects*: development of consumer protection system, empowerment of local officials and community awareness on food scarcity.

Each task should be linked to targets and work indicators. Final output and institutions should be correlated.

CONCLUSION

Agricultural support services for small farmers demand the participation of all stakeholders including farmers and agricultural development agents. Government is expected to play the role of facilitator and be responsible for regulation, guidance and control. The community will carry out the production process, marketing and distribution. The government would also create an enabling environment for agricultural development.

Empowerment of the farming community can be ensured through decentralization of decision-making to local government as well as through the active participation of the community in the planning and implementation of programs and projects.

Strengthening agricultural support services can be addressed in a holistic manner ranging from management of food production to food availability, distribution and consumption.

REFERENCES

Bimas Ketahanan Pangan DepTan, 2001. Pemantapan Ketahanan Pangan Tahun 2001-2004, Jakarta, April 2001.

Department Pertanian, 1985. Membangun Pertanian Yang Tan Tangguah, Jakarta.

Habirono, Haryo, 2001. Otonomi Itu Perubahan, Lesung, April, 2001.

Media Informasi Krida Pertanian No. 64, Pemberdayaan Penyuluh Pertanian dan SDM Petani – Nelayan, Oktober 1999.

Simatupang, Pantjar, *et al*., 2000. "Indonesia's Agriculture Sector during the Turbulence of the Economic Crisis", *Jurnal Litbang Pertanian*, 19(3).

Tjiptoheriyanto, Priyono, *et al*., 1998. Population, Environment and Development in Indonesia at Present and in the Near Future, State Ministry for Population, Jakarta.

7. ISLAMIC REPUBLIC OF IRAN

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INTRODUCTION

The agriculture sector in Iran secures 82 percent of the country's food requirements, 27 percent of the GDP, 24 percent of all employment opportunities, 35 percent of non-oil exports, and the provision of primary material for many industries. A major proportion of products, employment and non-oil exports are produced and generated by rural households in rural areas, amongst whom small-scale farmers fulfill a fundamental role. From this perspective, rural development can have considerable impact on agriculture and community development. According to Shepherd (1998), "rural development is the set of activities and actions of diverse actors – individuals, organizations, groups – which taken together lead to progress in rural areas. Progress is defined differently by different people. Historically, material progress – growth of incomes and wealth, poverty alleviation – has been the main consideration in development theory and practice. Today, other indicators of progress – cultural, spiritual, ethical – are increasingly taking their place beside material in a reformulated, more holistic concept of development".

Even the World Bank, renowned for its economic base, has placed particular emphasis on non-economic factors and elements.

> "*Building on lessons of the past and insights from recent poverty assessments, the Bank's rural development efforts in the future need to focus more on people, and particularly poor people, using "bottom-up", non-sectoral community participatory approaches. We must widen the scope of rural development and aim to reduce poverty wherever it is found in rural areas*."

Judging by these conceptual definitions, one can observe a very clear emphasis on rural people, most of whom are small-scale farmers.

This paper will start with an analysis of the contribution of rural areas to agricultural and livestock production and the extent to which these products rely on small villages and small-scale farmers. Then, the results of the author's own research on the government's support services in relation to livestock issues will be presented. This will be followed by a brief description of the government's support programs in the rural infrastructure sector and support policies with respect to annual crops. The paper will end with final conclusions and recommendations.

THE SHARE OF VILLAGES AND VILLAGERS IN AGRICULTURAL PRODUCTION

Over the past three decades, the rural community in Iran has experienced great peaks and troughs, particularly with respect to population. The share of rural population fell from 62 percent in 1966 to 38.3 percent in 1996, corresponding to a fall in the population growth rate from 2.3 percent between 1976-86 to 0.4 percent between 1986-96 (Statistics Centre of Iran [SCI], 1996). This is taking into consideration the fact that the natural population growth rate in rural areas between 1986 and 1996 equaled 2.6 percent (SCI, 1998). The most important factors leading to this fall in the rural population include rural-urban migration and the transformation and integration of villages into towns (Ganjian Mousavi, 2000). According to the latest general agriculture census (1993), of the total 4.6 million ha of irrigated arable land of annual crops, 86 percent are rural holdings and only 14 percent are non-rural holdings. A similar situation exists with respect to rainfed arable land of annual crops.

Table 1. Area under Cultivation of Annual and Perennial Crops according to Agricultural Holdings (village- and non-village-based/rural and non-rural holdings), 1993

(Unit: 000 ha)

Description	Annual Crops				Perennial Crops	
	Irrigated		Rainfed			
	Area	Percent	Area	Percent	Area	Percent
Rural holdings	3,968	85.4	4,362	84.9	735	78.1
Non-rural holdings	469	10.6	775	15.1	206	21.9

Sources: (1) SCI, 1996; and (2) RRC, 2000.

Based on Table 2, it may be observed that rural holdings constitute 82 percent of goats, 84 percent of sheep and 90 percent of cattle from the total number of livestock.

Table 2. Share of Rural and Non-rural Holdings from the Different Types of Livestock

(Unit: 000 head)

Description	Goats		Sheep		Cattle (cows and calves)	
	Number	Percent	Number	Percent	Number	Percent
Rural holdings	15,523	82.0	31,507	84.2	4,653	90.7
Non-rural holdings	3,400	18.0	5,913	15.8	475	9.3
Total	18,923	100.0	37,420	100.0	5,128	100.0

Source: RRC, 1993.

ROLE OF SMALL-SCALE FARMS AND FARMERS IN THE AGRICULTURE SECTOR

A review of statistics reflects some interesting deductions. Half of the irrigated land under cultivation of perennial crops and more than 60 percent of rainfed land are found in orchards and nurseries[1] in villages of less than 100 households. Villages of more than 250 households hold less than 30 percent of rainfed and irrigated land under cultivation of annual and perennial crops. Overall, approximately 75 percent of the total cultivated land is located in villages of less than 250 households (Appendix I).

Basically, villages of less than 100 households[2] hold more than half of the irrigated arable land, 60 percent of cultivated rainfed land, 73 percent of goats, 60 percent of sheep and 50 percent of cattle in rural areas (Appendix I and II). According to the General Census of Agriculture, 64 percent of the total agricultural holdings of irrigated land are less than 10 ha and 42.3 percent are less than 5 ha. Holdings of above 20 ha constitute only 22 percent of irrigated arable land (Table 3). Seventy-seven percent of the total irrigated and rainfed perennial crop lands are related to holdings of less than 5 ha. Holdings of above 15 ha include only 10 percent of the total perennial crop areas (Appendix III).

Table 3. Percentage of Number of Agricultural Holdings according to Ownership of Arable Land

Description	Less than 5 ha	Less than 10 ha	More than 20 ha
Percentage of number of agricultural holdings from the total	42.3	64	22

Source: Calculated based on statistics from the General Census of Agriculture, 1993.

From the above information, some conclusions can be derived:

[1] In Iran, perennial crops can be taken as synonymous with orchards and nurseries.

[2] Note that villages of less than 100 households make up 28 percent of the total rural population.

* Eighty-five percent of all cultivated arable land (irrigated and rainfed), perennial crop areas, goats, sheep and cattle are owned by rural holdings. Non-rural holdings own only 15 percent of all annual and perennial crop lands, and 9-18 percent of livestock varieties.
* Almost half of the country's crop and livestock products are produced in small villages (less than 100 households).
* Crop and livestock sector are mainly dependent on small-scale holdings.
* A major part of water and soil resources are based in small villages.

Based on these realities, small villages and holdings should be paid particular attention in national and agricultural development policies (including rural and agricultural development, food security, poverty alleviation and reduction of deprivation). This is particularly important as many of the population-related limitations applied in infrastructure policies actually exclude small villages from medical, infrastructural and training services, and agricultural and infrastructural support facilities.

STRUCTURE AND POLICIES OF SUPPORT FOR THE LIVESTOCK SECTOR AND METHOD OF DISTRIBUTION OF GOVERNMENT SUPPORT

During the past year, the two ministries related to the agriculture sector have been merged into one, Ministry of Jihad for Agriculture, as had been determined in the Third National Socioeconomic and Cultural Development Plan (2000-04). Various organizations and departments are involved in livestock activity both through government and non-government agencies. The Ministry's Deputy of Livestock Affairs is the focal point for policymaking, planning and extension of services in the livestock sector. Several government firms are also active independent of the Deputy. Despite the thrust on privatization and structural adjustment policies of the past decade, many livestock production units and factories, particularly industries, have still not been privatized.

The main support policies of the government with respect to livestock affairs are as follows:

* Import of fodder
* Purchase of fodder from domestic producers
* Extension of preventive and hygiene services in the livestock sector and for combating contagious livestock diseases (free or at prices far less than the costs)
* Provision of low-cost bank facilities (subsidized loans)
* Provision of some livestock inputs at prices lower than the free market (subsidized)
* Provision of training and extension services which are usually free.

Although considerable support and credit has been invested in the livestock sector as shown above, the more significant point is the method of their distribution among different groups.

Method of Distribution of Low-cost Land Facilities

One of the most significant instruments of support for the agriculture and private sector is the allocation of bank credit through the Agriculture Bank and other banks. The interest rate of credit granted through banks under the supervision of the government is considerably lower than the free market.

Based on a study carried out over three years, the situation with respect to the distribution of subsidized credits to the livestock sector is shown in Table 4.

Table 4. Bank Credit Granted to the Various Livestock Activities from 1993-95

(Unit: Rl. million)

Description	1993	1994	1995	Total	Share of Each Activity from Total (percent)
Modern cattle farms	111.1	345.0	182.4	638.5	48.3
Modern poultry	124.2	273.6	125.9	523.7	39.6
Traditional rural farms	51.7	65.4	43.0	160.1	12.1

Source: A. Rahimi,, 2000.

Table 4 shows that the share of rural livestock farms provided with bank credit is only 31 percent of the share of modern poultry and 24 percent of the share of modern cattle farms, respectively, despite holding more than 70 percent of the total livestock production. Further, rural farms received only 12 percent of the total subsidized bank credit between 1993 and 1995. Based on the results of a field research on 500 rural cattle units and 350 modern units, it was found that only 10 percent of the surveyed rural units had been able to benefit from bank credit (loans), the corresponding figure for modern units being 33 percent. The reason stated for rural units benefiting less was the existence of difficult conditions and regulations. From the total subsidies related to bank loans for livestock affairs between 1994 and 1996, only 7.8 percent were allocated to rural farms. The corresponding figures for modern poultry and cattle farms are 35 percent and 57 percent, respectively (Table 5). This is in spite of the fact that 91 percent of the active labor force in this sector are small rural livestock breeders, while only 9 percent are employed in modern farms.

Table 5. Subsidies Paid Towards Low-price Banking Credit in the Livestock Sector (according to the recipient groups) between 1994 and 1996

(Unit: Rl. billion)

Description	Industrial Cattle Breeders		Traditional Rural Cattle Breeders		Industrial Poultry		Total
	Amount	Percent	Amount	Percent	Amount	Percent	
1994	55.2	47.8	9.8	8.5	50.5	43.7	115.5
1995	183.0	60.8	15.2	5.0	103.0	34.2	301.2
1996	81.0	55.8	19.0	13.1	45.2	31.1	145.2
Total for three years	319.2	56.8	44.0	7.8	198.7	35.4	561.9

Source: A. Rahimi, 2000.

Method of Distribution of Imported Livestock Inputs (Subsidized)

The distribution of imported livestock inputs by the government at prices lower than the final cost, is the major government support for the livestock sector in Iran. Comparisons show that small-scale units have benefitted far less than large-scale units, which have been the priority. Implementation of structural and liberalization policies from the beginning of the 1990s has led to an increase in the price of production services and inputs and a rise in the cost of utilizing modern techniques and equipment, particularly amongst small-scale rural units, as some of these services and inputs (such as artificial insemination and veterinary services) were delegated to the private sector.

On the other hand, due to their solidarity and greater bargaining power, cooperatives and unions linked to large-scale units are more capable of attaining government support services. As an example, in the period 1990-96, almost Rl.2.3 billion were spent on importing industrial poultry inputs. It should also be noted that of the total inputs of this industry, 70 percent relies upon domestic resources (Table 6).

During the above-mentioned period, almost US$0.7 billion were spent on modern cattle units, while only US$0.3 billion (9 percent of total) were allocated towards import of inputs for traditional rural farms.

Table 6. Allocated Foreign Exchange for Import of Inputs in the Livestock Sector based on the Different activities from 1990 to 1996

Description	Industrial Poultry		Industrial Cattle Farms		Rural Husbandry		Total Amount
	Amount	Percent	Amount	Percent	Amount	Percent	
Foreign exchange allocated for import of inputs	2,300	69.7	698	21.2	299	9.1	3,297

Sources: (1) Ministry of Jihad, Deputy of Livestock Affairs, 1995; and (2) Ministry of Jihad, Deputy of Planning, 1994.

Over the past few years, many of these subsidies have been eliminated, and this has led to protest by many livestock units, particularly modern poultry. Rural farms, due to their lack of organization, have been

unable to protest. Some experts believe that allocation of foreign exchange subsidy to modern and large-scale producers (without adequate and proper planning) is one of the factors causing lack of effectiveness of production, and resulting in the inability to compete with foreign products.

Other Support Programs in the Livestock Sector

In addition to the provision of credit and imported inputs to producers at subsidized rates, the government is also active in the field of training and extension, as well as veterinary services, hybrid insemination and research. Almost all extension activity in rural areas is carried out by government agencies. The majority of these activities are aimed at rural households, a large section of which are small farmers. For the provision of veterinary activities, a separate organization has been established which has line agencies at province, town and sometimes village level, with the responsibility of extending the veterinary services and preventing the spread of contagious diseases. It is estimated that 70 percent of the activities of this organization relate to rural husbandry. Through the implementation of structural adjustment policies over the past decade, part of these activities were delegated to the private sector while some of the support was withdrawn. The cost of some of the services extended by the government also rose. In reality, these policies have meant less support for small farmers, and some have been discouraged from using new methods such as cattle vaccination.

Estimation of the Total Government Support Services Aimed at the Various Activities in the Livestock Sector

Of the total support services extended by the government to the livestock sector from 1993 to 1995, almost 61 percent of all subsidies paid were allocated to industrial poultry, 25 percent to industrial cattle farms, and only 14 percent to traditional rural cattle farms (A. Rahimi, 2000). Over the past few years, part of the subsidized foreign exchange allocated to production units has decreased. Calculation of the income elasticity of demand for different types of meat through the estimation of Engel's function shows that chicken meat is considered a luxury item for both urban and rural households, compared to red meat (S. Rahimi Soureh, 1997). A comparative review with respect to urban and rural households shows that if red meat, chicken meat and fish are taken into account as one item, then this would be a necessary item for urban households, but a luxury item for rural households. The estimation of Engel's function for the lowest and highest income groups validate this finding. Results of research carried out on the extent of support services extended for various livestock activities, as well as the study of consumption behavior of urban and rural households, show that urban households are receiving more support and subsidy, due to the fact that meat is part of their basket of necessary goods.

RURAL INFRASTRUCTURE AND SUBSIDIES

Bringing about transformation in rural areas and bridging the gap between urban and rural areas became fundamental goals after the revolution of 1979. During the two decades after the revolution, 76,000 km of rural roads have been constructed (76 percent of the rural population are now linked to the transportation network), and electricity has been extended to 32,000 villages (corresponding to more than 90 percent of the villages of more than 20 households). Thirty-three thousand villages have access to potable water, that is, more than 85 percent of the village with more than 20 households.

Despite these impressive figures, rural-urban migration, the abandonment of villages and the rising rate of unemployed rural youth continues to be a matter of serious concern. One major factor might be the lack of support for small farmers and the allocation of most of the subsidies and support services (subsidies, inputs, etc.) to large landholders and modern industrial cattle breeders. Available indicators show that of the total subsidies paid by the government in 1998, the share of urban households was 6.7 times that of rural households. Rural people received only 18 percent of subsidies paid.

METHOD OF PAYMENT OF CREDITS BY THE AGRICULTURE BANK

The Agriculture Bank is considered a specialized bank in the agriculture sector, and is one of the major sources of subsidized credit (at rates lower than the normal bank rates). The amount of subsidized credit

granted by specialized banks is determined by the government. Commercial banks also provide credit to the agriculture sector.

Eighty-three percent of the total direct loans[3] provided by the Agriculture Bank are current loans (recurrent capital, purchasing of changing inputs, etc.) and only 13 percent[4] are capital loans (for establishing new units). Figures show that the total subsidized credit granted in 1997 was Rl.1,700 billion (US$212 million).[5] A review of all loans provided (subsidized and direct) to the agriculture and rural sector by the Agriculture Bank and two other organizations shows that only 28 percent of all loans paid are small loans and 73 percent are medium or large loans. Also, only about 5 percent of the subsidized loans in 1997 were related to small loans and the remaining 95 percent were medium or large loans (Table 7) (Khazaei, 1999).

Table 7. Distribution of Different Types of Loans by the Agriculture Bank in the Agriculture Sector According to Size of Loan

(Unit: Rl. billion)

Description	Size of Loan	Value	Percent
Direct loan (without subsidy)	Small	476	28.3
	Medium	735	43.8
	Large	469	27.9
Subsidized loans	Small	39	4.3
	Medium	271	29.6
	Large	604	66.1

Source: Khazaei, 1999.

Since large loans are usually not given to small farmers, it can be concluded that their share of subsidized and direct loans is very limited. In other words, the inclination of the government and affiliated financial institutions is towards larger units, keeping in mind that there is no credible research that can claim that larger agriculture units have been more effective or efficient.

SUPPORT POLICIES IN OTHER AGRICULTURE SUB-SECTORS

Other government policies aimed at supporting the producers of agricultural products in order to encourage and develop the cultivation of basic farm products are the determination of assured prices and the purchasing of products from farmers. Assured prices rise almost annually. This policy influences about 15 percent of farm and livestock products, the most important of which are wheat, barley, rice, corn, sugarcane, milk and dairy products. Although this policy is an effective factor in raising the assurance and securing the income of farmers, the announced prices are still much lower than global prices.

The total subsidy paid towards agriculture and food items in line with support policies for producers and consumers in 1998 reached a value of Rl.5,800 billion (equaling almost US$725 million according to free market rates), 70 percent of which relates to wheat. These products made up 92 percent of the government's subsidies (Table 8).

Statistics on the share of small-scale farmers in the subsidies discussed above were not available. It is clear that the distribution of these subsidies is linked to assets (size of land owned). It must be recognized that these subsidies are paid by the government, and experience has shown that within the existing system of subsidy payment, large-scale farmers have more quantitative and effective access to the subsidies.

With the purpose of extending some of the subsidies and subsidized loans and also to purchase products at assured prices, rural cooperative companies were established in rural areas. These companies were allocated resources to purchase products on behalf of the government. Studies show that small farmers

[3] Direct loans are loans that banks pay out of their internal resources, without government subsidy. In any case, the interest rate of these loans is less than that of loans related to the capital market (free market).

[4] Subsidized loans are those for which the government secures part of the interest rate.

[5] Calculated according to the free market foreign exchange rate.

benefit less from the facilities extended through these cooperative companies compared to larger farmers. In relation to livestock products, the relevant cooperatives are based in urban centers. Decisions and management are usually in the hands of industrial cattle farms. Rural people have no significant role in decision-making, management or direction, and have less access to their facilities (S. Rahimi-Soureh, *et al*., 1997). This is considering the fact that traditional rural husbandry secure more than 70 percent of the country's milk and meat production.

Table 8. Subsidy Paid for Some of the Main Agricultural Crops and Inputs, 1998

Description	Subsidy Paid (Rl. million)	Share	Change, 1997-98 (percent)
Wheat	4,448	68.3	+31
Chemical fertilizers	453	6.9	-13
Sugar and lump	85	1.3	-71
Milk products	284	4.4	-31
Oil	177	2.7	+30
Meat	84	1.3	-24
Rice	159	2.4	+107
Tea	30	0.5	-40
Fertilizer and seed	43	0.7	-36
Insurance of crops	12	0.2	0
Others	733	11.3	-
Total paid	6,508	100.0	+8.5

Source: Central Bank of Iran, *Economic Report, 1999*, p. 26.

CONCLUSIONS

The agriculture sector fulfills a fundamental role in the economy of Iran, and within this sector, the major part of production and agricultural activity is carried out by rural people in rural areas. From this perspective, it is essential to design a process of rural development that pays particular attention to human factors and to the real needs of rural communities, with the aim of developing the agriculture sector and the national economy. Such an emphasis is clearly visible in the views and ideologies of international organizations and experts.

Statistics from the agriculture sector testify to the importance of rural development. Despite a decrease in the rate of population growth in rural areas and the migration of rural people to urban areas, 40 percent of the country's population are still based in rural areas. Eighty-five percent of the total area of arable land (irrigated and rainfed) and perennial cropland are under the ownership and management of rural households, as are 85 percent of the total number of livestock (cattle, sheep and goats). On the other hand, almost 60 percent of these activities are undertaken in villages with less than 100 households (small villages), yet it is the larger villages that have claimed share of greater infrastructure programs and the government's support services.

Amongst rural households, the major part of facilities and activities (agriculture land and livestock varieties) belong to small-scale farmers. For example, 64 percent of all agricultural holdings of irrigated land are less than 10 ha, and only 22 percent of irrigated land is related to holdings of over 20 ha.

Research on support services for the livestock sector shows that industrial and large-scale producers benefit more from the facilities, credit and extensive support services provided compared to rural cattle-breeding households. For example, although 70 percent of livestock products are related to rural areas and small-scale farmers, this group has received only 12 percent of bank facilities.

Similarly, with respect to access to subsidies for imported inputs, small-scale rural breeders have benefitted the least. With the implementation of structural adjustment and liberalization policies within the first and second development plans, some of these subsidies were withdrawn and the support decreased. This led to a rise in the price of agricultural inputs. Even under such circumstances, the bigger industrial units,

due to their greater bargaining power with government and political organizations, have better managed to safeguard their interests and retain the use of facilities and subsidies.

Small-scale rural producers have benefitted more from certain support services compared to other groups: veterinary services, especially prevention measures against contagious diseases; training and extension services provided by the Ministry of Agriculture or affiliated organizations; and infrastructure projects in villages.

A review of the method of payment of credit in the agriculture sector shows that direct loans (secured from the bank's internal resources) and subsidized loans (at lower interest rates) are usually cornered by larger-scale units.

Existing cooperatives in rural areas have been established with the aim of extending services and mobilizing the greater number of the rural communities, and to have an impact on their production and welfare activities. However, the activity of the cooperatives today has been reduced to the distribution of the government subsidized services (e.g., distribution of imported or subsidized inputs and purchasing portions of agricultural products at guaranteed prices). A study of the performance of cooperatives in villages shows very weak and limited activity at village level.

In viewing villagers and small-scale farmers as consumers, some fundamental differences are again observable in the extent to which urban and rural consumers benefit from support services and subsidies. Figures relating to the government's support of consumers show that in comparison to rural households, urban households are provided with six times as much in terms of subsidies. Subsidizing some of the products that are considered as luxury items for most rural and low-income households means that higher income groups benefit more from government subsidies and support, a situation that is in direct contradiction to the original intention of these programs.

In short, and based on the arguments presented in this paper, it can be concluded that small-scale farmers gain the least benefit from both the support policies aimed at producers and those aimed at consumers, even though they manage the majority of activities and productions in the agriculture sector.

RECOMMENDATIONS

Based on the conclusions discussed above, it may be appropriate to reflect upon some basic recommendations:

* Designing appropriate policies and strategies in order to direct bank facilities towards small-scale farmers; one of the most fundamental strategies could be the recognition of the role that micro-credit can play in rural areas.
* Anticipating a more active role for small-scale farmers in institutions and cooperatives related to the agriculture sector – from establishment to management to monitoring.
* Creating a relative balance in extending support services to urban and rural consumers.
* Changing the criteria and indices for infrastructure and production investment in rural areas, so that small and medium level villages and households can benefit more.
* Providing support for the establishment of institutes involved in marketing, marketing research, research and development related to agriculture sector products and investment possibilities.\
* Making necessary amendments to bank laws and regulations, particularly the agriculture bank, concerning the provision of credit to small farmers, with adequate flexibility to adapt bank regulations to production and commercial methods in rural areas.
* Designing more appropriate policies and actions in rural areas, such as the development of non-agricultural activity and the strengthening and expansion of rural and cottage industries.
* Establishing, strengthening and supporting NGOs and people's institutions and cooperatives in rural areas, and encouraging the private sector into agricultural activity in rural areas; the experience of some developing countries such as India, Indonesia, Kenya and a few other Latin American countries shows that the establishment of producer organizations and cooperatives for the extension of low-cost services to small-scale farmers has been effective.
* Carrying out applied research with the aim of separating different types of services linked to each of the sub-sectors of and with respect to sociocultural conditions and demands of rural communities and

producers. After this classification, various services can be gradually delegated to the private sector and NGOs according to their capacity and capability. The government and the affiliated organizations should focus on policymaking, guidance, effective and efficient monitoring so that services extended by the private sector and NGOs can better reach the social optimum. Particular emphasis should be placed upon issues such as free-riding, externalities, moral hazard problems.

* Making insurance systems of agricultural and livestock products more efficient, particularly with respect to coverage of small-scale farmers and cattle breeders.

REFERENCES

Central Bank of Iran. *Economic Report*, different years, Tehran.

Khazaei, Ali, 1999. *Recognition of Financial Institutions Conditions in the Rural Areas*, pp. 189-198, RRC.

Rahimi, Abbas, 2000. *Policies for Agriculture*, RRC, Tehran.

Rahimi Soureh, Samad, *et al*., 1997. *Recognition and Collection*, RRC.

Rural Research Centre, 1998. Computerized information of General Census of Agriculture.

Shepherd, Andrew, 1998. *Sustainable Rural Development*, Macmillan Press, London.

Statistics Centre of Iran, 1995. *General Census of Agriculture*, Tehran.

----------, 2001. *Iran Statistical Yearbook 1998*, Tehran.

World Bank. *From Vision To Action Update* (revised version), Concept Paper, 13 July.

----------, 1992. *The Balance Between Public and Private Sector Activities in the Delivery of Livestock Services*.

Appendix I

The Share of Different Classifications of Villages (by Number of Households) with respect to Total Land under Cultivation of Annual and Perennial Crops

(Unit: 000 ha)

Rural Classifications by Number of Households	Land under Cultivation of Annual Crops				Orchards and Nurseries	
	Irrigated		Rainfed			
	Area	Percent	Area	Percent	Area	Percent
Up to 20	604	15.2	692	17.5	134	18.2
20-50	595	15.0	575	14.5	96	13.1
50-100	727	18.3	995	25.1	137	18.6
100-250	1,039	26.2	1,075	27.1	187	25.5
250-500	605	15.3	408	10.3	110	15.0
500-1,000	316	8.0	184	4.7	56	7.6
Over 1,000	81	2.0	32	0.8	15	2.0
Total	3,967	100.0	3,961	100.0	735	100.0

Sources: SCI, *Iran Statistical Year Book*, different years, Tehran; and RRC, computerized information of General Census of Agriculture, 1993.

Share of Different Classifications of Villages (by Number of Households) with respect to Different Types of Livestock

(Unit: 000 head)

Village Classifications by Number of Households	Goat		Sheep		Cattle	
	Number	Percent	Number	Percent	Number	Percent
Up to 20	5,440	35.1	6,435	20.5	592	12.7
20-50	3,153	20.4	6,085	19.3	823	17.7
50-100	2,643	17.1	6,257	19.9	1,010	21.7
100-250	2,594	16.8	7,234	23.0	1,259	27.1
250-500	1,042	6.7	3,560	11.3	629	13.5
500-1,000	548	3.5	1,632	5.2	275	5.9
Over 1,000	64	0.4	265	0.8	65	1.4
Total	15,484	100.0	31,468	100.0	4,653	100.0

Source: RRC, computerized information of General Census of Agriculture, 1993.

Appendix II

Rural Population with respect to Villages Classifications by Number of Households, 1996

Village Classifications by Number of Households	Population (million persons)	Percent	Accumulative Percentage
Up to 20	1.6	7.1	7.3
20-50	2.5	11.1	18.4
50-100	3.6	16.0	34.3
100-250	6.2	27.6	61.8
250-500	4.3	19.1	81.0
500-1,000	2.9	12.9	94.0
Over 1,000	1.4	6.2	100.0
Total	22.5	100.0	

Source: SCI, *Iran Statistical Year Book*, 1999, Tehran.

Appendix III

Area of Arable and Perennial Crop Land belonging to Holdings
with respect to Different Classifications of Land Size

(Unit: 000 ha)

Land Size of Holdings (ha)	Irrigated Arable Land		Perennial Crops	
	Area	Accumulative Percentage	Area	Accumulative Percentage
Up to 0.5	64.49	1.6	117.42	15.9
0.5-1	114.02	4.4	109.68	30.7
1-2	274.07	11.1	166.88	53.2
2-3	290.43	18.2	95.37	66.1
3-4	264.12	24.7	52.86	73.2
4-5	246.48	30.8	30.02	77.3
5-7.5	556.09	44.5	48.79	83.9
7.5-10	262.87	51.0	13.45	85.7
10-15	490.15	63.1	23.68	88.9
15-20	234.19	68.9	9.04	90.1
20-25	217.81	74.3	8.32	91.2
25-35	207.90	79.4	8.80	92.4
35-50	147.94	83.0	6.22	93.2
50-100	247.80	89.1	13.04	95.0
100-200	169.42	93.3	8.90	96.2
Over 200	277.70	100.0	27.93	100.0
Total	4,065.48		740.40	

Source: SCI, *General Census of Agriculture*, 1993, pp. 14-24, Tehran.

8. REPUBLIC OF KOREA

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INTRODUCTION

Korean agriculture is characterized by small owner-operated farms with an average farm size of 1.37 ha. For that reason, the government's agricultural support services are basically intended for the small farmers. Korea has focused its agricultural policy on increasing the production of farm produce. Therefore agricultural support system has concentrated on raising the productivity of farmland.

The production-oriented agricultural support system is being altered because of changes in the agricultural scenario. As a result of rising farm productivity, Korea has achieved self-sufficiency in some commodities, especially the rice, the Korean staple food. Marketing of agricultural produce has become more important than production, moreover, market liberalization initiated in the late 1980s has brought about severe competition in the agricultural market. Consumers increasingly look for high quality and safe food. Diversification of consumers' needs speeds up the differentiation of products. Marketing channels are specialized and diversified, and large-scale retail units, such as discount stores, will keep increasing their market share.

All these new environmental changes require new directions and measures in the Korean agricultural support system. It has become important to meet consumers' needs and to adapt suitably to market change. Hence the agricultural support system has shifted from a production-oriented to market-oriented system.

Under the market-oriented support system, the most important aspect is to help the farmers produce high quality farm products in order to satisfy the consumers' diverse needs. For this purpose, investment in the research and development of new technologies is required. There is need for reorganization of the agricultural marketing system to address consumer preferences.

The purpose of this paper is to review the market-oriented agricultural support system in Korea. After a brief sketch of Korean agriculture, the first section explains the government's agricultural support services for small farmers. The agricultural cooperative's role in providing support to small farmers is described in the following section.

OUTLINE OF KOREAN AGRICULTURE

As a result of remarkable economic development in the last four decades, the share of agriculture in the economy has declined from 23.3 percent of GDP in 1970 to 4.4 percent in 1999. Nevertheless, agriculture in Korea continues to play an important role for the nation in terms of national food security and environmental conservation.

Korean agriculture is characterized by very small owner-operated farms. Agricultural land is scarce and industrial and urban demands have progressively encroached on farmland. Despite efforts to moderate this trend, about 17,000 ha get converted to industrial use annually. Because of the low land/population ratio, average farm size in Korea is very small. Almost 60 percent of farms have less than 1 ha and only 4.6 percent have more than 3 ha.

Rice is the staple food in the Korean diet. It is also the dominant crop in terms of cultivated area, volume produced and contribution to farm income. Rice dominated agricultural production, with a share of 38 percent of the total production value, and 50 percent of agricultural income in 1999.

However, livestock, fruits, and vegetables are becoming increasingly important year by year. Income growth and concentration of population in urban areas have increased consumption levels.

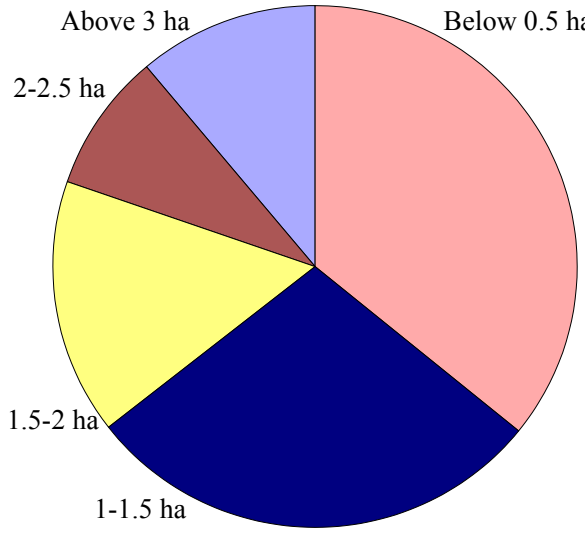

Figure 1. Distribution of Farm Households by Land Size, 1999

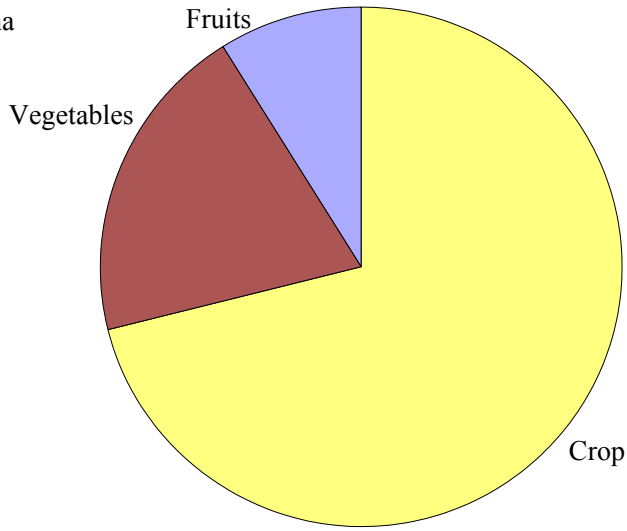

Figure 2. Share of Area of Agricultural Products, 1999

Source (Figures 1 and 2): Ministry of Agriculture and Forestry (MAF).

ISSUES OF AGRICULTURAL SUPPORT SERVICES

Changes in the Agricultural Environment

Rapidly changing environments such as trade liberalization and the altering of food consumption patterns have had significant influence on Korean agriculture.

The food industry in Korea is increasingly driven by consumers' and retailers' preferences rather than by producers' choices. The emphasis is shifting from production to marketing and consumption. The basis of successful marketing is understanding the needs of customers. The recognition of changes in major consumer trends and an understanding of their marketing implications becomes crucial.

Food consumption patterns in Korea have changed considerably in recent years. Numerous factors are responsible for these changes. One of the most important factors is the increased participation of women in the labor force. Women in the work force face the greatest time pressure because they usually have take care of domestic in addition to work at the workplace. Therefore, convenience is now one of the most important attributes of food products.

The import of agricultural products has been increasing dramatically after UR Agreement and the establishment of the WTO. Korean farmers have to compete with farmers overseas to secure a market share for their agricultural products.

As income increases and food imports expand rapidly, food safety issues become a major concern for Korean consumers. Although there is no clear scientific consensus on the health risks, the public often reacts strongly.

Food retailing industries are changing rapidly to respond to consumer trends. The number of smaller convenience stores are increasing. Conventional supermarkets are being replaced by discount stores or wholesale clubs.

Market-orientation of Agricultural Support Services

The change in market conditions has affected the agricultural support system. Severe competition in the agricultural market and the diversification of consumer preferences have forced the support system to change from a production-oriented to a market-oriented one. Trade liberalization and the onset of the information-oriented society also underscore the need to set up support systems to satisfy market needs.

Food security has always been a strong concern of Korean agricultural support system. Hence support services were concentrated on increasing production. For increasing production, high-yield varieties of grain were found suitable. But rapid income growth and urbanization have changed this production-oriented trend.

Consumers now prefer quality to quantity. As the risk of environmental contamination increases, the need for food safety and healthy food have acquired greater importance.

Therefore government has developed the better tasting varieties to meet consumers' needs. Environment-friendly farming supports have been introduced to produce safe food. Despite the fact that the price of environment-friendly cultivated commodities is higher than that of the regular food, demand for them has been gradually rising. It has therefore become necessary to provide effective support services which help farmers to produce according to needs of consumers.

Agricultural marketing support systems have also adapted to a market-oriented system. In the past, rice was generally sold in the 80-kg package. The big package was somewhat difficult to handle, so the package size has been reduced to smaller ones. Nowadays smaller packages from 4-kg to 10-kg are usually used for wrapping up the rice. The range of package sizes is the result of applying changing consumers' preferences to marketing.

Market-oriented support system has acquired greater importance with the development of information and communications technology. Agricultural cooperatives use the internet to sell their farm produce. As the number of internet users increase, the market share of the cyber market is expected to rise. Cyber marketing will contribute to reduce marketing cost by facilitating direct transaction between farmers and consumers. Government and cooperatives have, therefore, made efforts to develop farmers' ability in the use of computers by providing education and training courses.

Market-oriented support system emphasizes market demand. If agricultural products fail to satisfy consumers' needs, the products can not contribute to increasing the farmers' incomes. Therefore, it is necessary to introduce new production skills and marketing methods to respond to the consumers' needs. Government and cooperatives are making efforts to change the production-oriented support system to a market-oriented one.

GOVERNMENT'S AGRICULTURAL SUPPORT SERVICES

Environment-friendly Farming Support

In order to reduce harmful environmental effects arising from agriculture, the government launched its sustainable agricultural policy in July 1996, and passed the Environment-friendly Agriculture Promotion Act in 1997. The new policy aims at reducing pollution and encouraging environment-friendly farming systems. Specific targets are set such as reducing pesticide use by 40 percent and chemical fertilizer use by 30 percent by 2004.

In order to achieve these targets, government initiated precision farming systems based on modern sustainable technologies. New policy programs including integrated pest management (IPM) and integrated nutrient management (INM) have been introduced. IPM is the development of pesticides with low toxicity levels and the establishment of safety guidelines for pesticide use. The objective of INM is to reduce the use of chemical fertilizers by developing and supplying slow release fertilizers.

To increase the sales of environment-friendly commodities, the government introduced a discrete labeling system in 1998. Consumers can easily differentiate the environment-friendly commodities from ordinary products by labels. Because the price of environment-friendly products are generally higher than those of ordinary products, if the labeling system is well equipped it will contribute to the increase of farmers' income.

Marketing Support Services

1. ***Construction of Marketing and Processing Facilities***

The Korean Government is making efforts to streamline the marketing of commodities after suitable packaging and brand-naming. For this purpose, the government is enlarging the construction of the vegetables and fruits packing centers, rice processing complexes (RPC), and livestock packing centers (LPCs). An investment of about US$278 million from 1991 to 1999 has been made for the construction of the 312 RPC units. RPC is conducting a wide range of postharvest processes for rice, including drying, storage and processing on a large scale. This can improve not only price competitiveness, by reducing labor cost in rice

marketing, but also quality competitiveness by applying modernized quality control methods. It also brings about a change in rice marketing channels by direct transactions with large buyers in city areas.

To improve the marketing structure of livestock products, the government plans to construct 10 LPC units by 2001. LPC conducts post-production procedure covering slaughtering, processing, sales and export of livestock products. If the LPCs are fully operational, it is expected that domestic marketing channels will be reduced from the current 5-6 to 3, and marketing costs decreased by some 20 percent. In this case, price and quality competitiveness of domestic meat is likely to be enhanced and cattle prices would move in line with consumer prices of livestock products.

2. ***Price and Production Stabilization Program***

The Korean Government has made efforts to stabilize the price and optimal production level of agricultural products. For this purpose, the government observes the estimated price and production prospect of various agricultural products. Therefore, government informs farmers of production prospects to enable them to make informed decision on what commodities to grow.

In 1999, the government introduced "calf production stabilization program" in 32 cities as an example, and enlarged the program at a nationwide level in 2000. Under this program, the government compensates livestock farmers for part of the difference between calf production cost and its market price if calf market price falls below a certain level. The objective of this program is to maintain *Hanwoo* (Korean native cattle) production base against a sharp drop in the price of cattle and calf.

3. ***Marketing Improvement in Consuming Areas***

The government is promoting direct transaction between farmers and consumers to reduce marketing costs. For this purpose, various types of farmer's markets suitable for location-specific conditions have been established including large-scale periodic marketplaces in metropolitan areas. Direct sales of meat in supermarkets and convenience stores without intermediate broker's involvement, is being encouraged.

The government is making efforts to eliminate the existing costly marketing structure by completion of scheduled construction of public wholesale markets. The newly constructed wholesale markets will introduce an electronic auction system and effect improvement in the current unloading and transporting systems.

Income Support Services

1. ***Direct Income Payment Programs***

Price support to agricultural products has become restricted under the UR Agreement on Agriculture. Therefore direct income payments decoupled with production and targeted to specific objectives were introduced as an alternative way of providing support to farmers.

In 1997, the Korean Government introduced a system of early retirement payment for small-scale and older farmers who transferred their farms to larger-scale and younger farmers. The objective of the direct payment is to improve farming productivity through land consolidation.

In 1999, direct payment for environment-friendly farming was also introduced. The direct payment was made for farmers in environment protection areas and who willing to undertake environment-friendly farming practices. Farms that are not eligible for the government's agricultural competitiveness enhancement program, are encouraged to produce high quality agricultural commodities in an environment-friendly manner.

The government currently introduced direct payment for paddy fields in 2001, for supporting rice farmers. The budget amounted to US$162 million, US$192/ha would be paid to rice farmers within the limit of 3 ha.

2. ***Crop Insurance Program***

Korean farmers have suffered from natural disasters which cause considerable damage to crops. The Korean Government, has therefore, introduced crop insurance for the income stability of farmers. To set an example, crop insurance program for apple and pear was implemented in 2001. If farmers brought insurance, they could be compensated as much as 70-80 percent of the financial loss resulting from natural disaster such as typhoon, hail and frost.

The government supports a portion of the insurance bill for farmers who buy insurance. It also supports the agricultural cooperatives, which sell the insurance, by supporting 50 percent of the managing expenses needed for operating the insurance.

Extension Services

1. ***Farmer Welfare Policy***

Major areas of welfare policy include improvement of rural education, introduction of farmers' pension system and betterment of rural medical facilities.

Problems in education, especially at the primary and school levels, are the most difficult in rural life. Many rural families decide to migrate to urban areas only on account of educational problems. To overcome this situation the government introduced the college entrance quota system which requires to colleges allocate a portion of seats to rural high school students. Three hundred thirty-four colleges participated in this project and accepted 15,820 students from rural high schools in 2000.

In order to solve the problem of aged farmers after retirement, government introduced the rural pension system in 1995 targeted at farmers. All rural residents between the ages of 18-59 (excluding those already participating in other pension systems through their jobs) are eligible to enroll in the farmers' pension system.

Medical betterment programs include expansion of rural medical facilities, improvement of medical services and reduction of medical costs. The government plans to invest US$368 million to support medical services to farmers. The fund needed for it would be provided primarily by the budget from the Specific Tax for Agricultural and Rural Development.

2. ***Expansion of Information Infrastructure***

The government supplies agricultural market information. The MAF operates the Agricultural, Fishery and Forestry Information System (AFFIS). AFFIS is a nationwide network specializing in agricultural information, in order to supply this information to farmers. The AFFIS collects various information through network of 74 institutions, processes it for easy use and disseminates it through internet (www.affis.net). It is expected that the database will improve efficiency in farm operations and agricultural marketing, and contribute towards dissemination of new farming technologies, as well as imparting advanced farm operation skills to farmers.

3. ***Research and Technology***

Agricultural research is carried out mainly by the Rural Development Administration (RDA) which conducts research on all aspects of agricultural technology. Its main research efforts are concentrated as follows: 1) stable and cost-efficient production of food grains; 2) safe and pollution-free production and adequate pest management; and 3) the adoption of high technology as a means of improving the economic efficiency of the sector.

Regional agricultural centers in RDA offer more active and dynamic extension services to farmers who require up-to-date farming technologies and marketing skills. All centers perform basic research and experiments specific to their location. They are equipped with research facilities such as general laboratories, animal health clinics and experimental fields. They provide superior seeds and stocks, and operate demonstration plots for new technologies, while assisting farmers with a "one-stop service" on technical and farming matters.

In addition to the RDA, the Korean Rural Economics Institute (KREI) carries out theoretical research on matters related to agricultural economics and agricultural policy. Reflecting the growing demand for processed food products, the Korea Food Research Institute (KFRI) was established in 1989 to develop and transfer new food technologies.

Agricultural Cooperatives' Support Services

1. ***Outline of Korean Agricultural Cooperatives***

Agricultural cooperatives in Korea are organized into a two-tier system, comprising primary cooperatives in local areas and their national federation, the National Agricultural Cooperative Federation

(NACF). Primary cooperatives are classified into both regional cooperatives and special cooperatives. Special cooperatives are organized by fruit and vegetable growers.

The NACF has currently 1,278 regional cooperatives and 109 commodity cooperatives as its members. The total number of member cooperatives increased from 1,177 in 1999 to 1,387 at the end of 2000, due to merger with the National Livestock Cooperative Federation and the National Ginseng Cooperative Federation on 1 July 2000. Almost all farmers are affiliated with these cooperatives.

Member cooperatives conduct such business as the marketing of agricultural products, supply of farm inputs and consumer goods, agricultural extension, banking and credit, and cooperative insurance. At the end of 2000, the NACF had 16 regional head offices, 156 city/county offices, and 494 branch offices across the country. It also operated 10 training institutes and 20 agricultural marketing centers to support its member cooperatives. In addition, the NACF runs various subsidiaries and affiliated companies. These include the Korea Agricultural Cooperative Trading Co., Ltd., the Namhae Chemical Corporation, the Nonghyup Tours, the Farmers Newspaper and Agricultural Cooperative College, etc. It also has four overseas representative offices in Tokyo, New York, Beijing and Brussels.

2. ***Financial Support Services***

Korean agricultural cooperatives provide financial services to their member farmers, who have limited access to channels offered by commercial banks or in the capital market. The structure of financial services is unique in that the federated national cooperative and its local primary cooperatives each maintain their own distribution networks directly aimed at farmers. The banking business of town level cooperatives and Mutual Credit (MC) business, is intended to make it possible for member farmers to help each other. Some members have savings and others need to borrow. MCs act as vehicles to channel the savings to those who need to borrow.

In addition to providing commercial financial services to member farmers, agricultural cooperatives act as financial institutions to handle agricultural policy loans funded by government. Sometimes agricultural policy loans are first funded by the deposits of cooperatives, and the government later compensates cooperatives for the interest difference between financial market rates and loan interest. The government uses subsidized agricultural loans to encourage farmers to operate certain types of farming indicated by the government. Because farmers do not have enough collateral to provide for borrowing, they need some facilities to substitute for physical collateral in order to have access to loans. The government has set up a credit guarantee system for primary industry, and it issues loan guarantees for farmers and fisherman.

3. ***Marketing Support Services***

A. *Marketing Supports in Producing Areas*

Primary cooperatives in producing areas have been active in order to ensure better prices for products produced by member farmers, and to enhance marketing efficiency. Agricultural cooperatives help primary producers make various commodity groups at the village level, such as cooperative farming groups. Cooperative farming groups are voluntary organizations of farmers whose aim is to promote cooperative marketing and produce quality products. A group is formed for each farm commodity and is composed of farmers producing that commodity in the neighborhood. In 2000, about 20,000 groups were active across the country. Agricultural cooperatives help these groups access new technology as well as market information.

Agricultural cooperatives assist in establishing various marketing facilities in order to reduce marketing costs and increase the efficiency of physical marketing such as transportation, processing, storage, packaging, sorting, grading and harvesting. The RPC is one of the most important marketing facilities in rural areas. In 2000, there were 199 RPC units operated by agricultural cooperatives.

Primary cooperatives also operate various marketing facilities such as collection places, warehouses and sorting, grading, packaging facilities in order to promote cooperative marketing. Collection places, which numbered 1,110 in 2000, are rural marketplaces that assist farmers in selling their products to private traders. Warehouses, including 258 cold warehouses, are useful for farmers who wish to suspend marketing of fresh products at times of unfavorable prices. Sorting, grading and packaging facilities are important for enhancing the quality of agricultural products and selling them at favorable prices.

Table 1. Cooperative Marketing Facilities in Producing Areas

Year	1990	2000
Collection places	208	1,100
Warehouses	79	196
Cold storage	28	258
Fruit sorting	23	99
RPCs	-	199
Marketing complexes for fruits and vegetables	-	25

B. *Price Stabilizing Programs*

Fruits and vegetable producers have suffered year to year fluctuation in prices, mainly due to variation in acreage. To stabilize prices of these products, the government has conducted various programs, in collaboration with agricultural cooperatives. For perishable vegetables, agricultural cooperatives make voluntary marketing contracts with farmers. When the market price is within 20 percent of the contract price, agricultural cooperatives are responsible for covering the price differences. Otherwise, the benefits or losses are shared between both farmers and cooperatives. There were 505 primary cooperatives participating in this program in 2000. An amount of US$270 million were raised for this program in 2000, and the amount of money was shared by the government (80 percent) and the agricultural cooperatives (20 percent).

Rice is the most important crop in Korea. Agricultural cooperatives have been engaged in all stages of rice marketing, from collection at the farm to retailing to consumers. Primary cooperatives also conduct the rice procurement business in order to support the rice price. Total volume of the rice marketing business of agricultural cooperatives was US$27 billion with a market share of 46.2 percent in 2000.

C. *Market Facilitating Services*

The NACF has provided various market services such as market information, packaging, standardization and financing. The NACF has played a role in providing market information to private traders. Market prices in producing areas and auction prices at wholesale markets are collected through NACF branch offices and distributed through the NACF online, automatic response service and internet (www.nonghyup.com).

The sorting of farm products into standardized grades is also a facilitating market function. The NACF and primary cooperatives have conducted various programs associated with grades and standards of farm products. These programs include quality guarantees, exclusive use of agricultural cooperatives' trademarks and development of new brands, etc. The NACF has also standardized 115 farm products in terms of handling and packaging. Agricultural cooperatives provide subsidies and loans to help promote grades and standards.

Marketing finance is another important aspect of market facilitating functions. Agricultural cooperatives have extended advance payments to farmers to prevent them from selling their products at unfavorable prices due to urgent need for cash. The NACF also helps primary cooperatives by providing low-interest loans for facilitating their marketing business.

Extension Services

1. ***Farming Guidance***

The extension activities of agricultural cooperatives related to farming technologies are performed both through education in training institutes and introduction of technologies by farming extension specialists in member cooperatives. Agricultural cooperatives also try to establish farming complexes and provide farmers' groups with technology education.

Furthermore, the Quality Control Committee established by NACF which instituted its own inspection standards and quality guarantee mark, has been conducting regular quality inspections and seeking marketing channels. Agricultural cooperatives operate a circuit collecting system which helps farmers market small

amounts of their products. This business, conducted since 1994, has been one of the most successful businesses that provide direct benefits to member farmers, especially small farmers in rural areas.

2. ***Living Guidance***

A. *Health Guidance*

To improve the medical care situation in rural areas, agricultural cooperatives provide member farmers and their families with medical care services. In particular the NACF and the A-San Social Welfare Foundation, a subsidiary of the Hyundai Group, signed an agreement to support rural medical services to farmers in January 1996. This welfare program has served to aid farmers suffering from accident and chronic diseases. Under the agreement, the A-San Foundation has designated 10 general hospitals as farmers' medical centers with appointment of doctors specialized in treating "Farmers' Syndrome". The NACF has taken part in supporting this program by shouldering the medical bills and research expenses necessary for developing medical solutions for this affliction. Under the program, medical services are provided to farmers such as free circuit clinic, discount treatment, regular medical checkup service, and various health lectures for farmer diseases. Fully-equipped mobile medical vans regularly transport doctors to designated areas. Economically-disabled farmers may see these doctors without charge. Funeral services were also provided to member farmers in many cooperatives to reduce economic burdens and to help maintain traditional customs.

B. *Consuming Life Guidance*

Agricultural cooperatives provide the consumer protection service to farmers for protecting their rights as consumers. The function of this support is the settlement of disputes arising from farmer consumers' complaints about agricultural inputs as well as consumer goods. Agricultural cooperatives have cooperated with Korea Consumer Protection Board (KCPB) to support this service to the farmers since 1996. Agricultural cooperatives receive complaints from farmer consumers about the quality and safety of products and inform the KCPB of the complaints. On receipt of such complaints, the KCPB gathers evidence and data from the consumers and producers, and tries to settle the problem taking into account test results and the opinion of professional committees.

C. *Legal Aid Services for Farmers*

A group of lawyers provides legal aid to defend the interests and rights of farmers who have little knowledge of professional fields such as law and tax. In July 1995, the NACF signed an Agreement on Legal Aid for Farmers with the Korea Legal Aid Corporation to provide this aid. In 1996, the NACF developed a deposit item named "Love to Farmers", designed to automatically commit over 0.4 percent of volunteer customers' deposit interest to raise funds for this program, while the NACF itself contributes 2 percent of the equivalent interest to the fund. Since July 1995 the NACF has raised US$4 million for this fund, which has been used for 18,000 legal cases.

3. ***Technology Education***

The 'New Farmers Technology College' provides special technology courses on advanced farming in such areas as horticulture, floriculture and livestock breeding. The course was instituted in 1984 at the Agricultural Cooperative College, with the objective of disseminating advanced farming techniques and information of farm management. The course emphasizes interactive learning with a mix of case studies and panel discussions, as well as field visits to sites of advanced farm households and experimental stations. The NACF also provides onsite lectures on new farming technology through Agricultural Management and Technology Guidance Groups organized at national and provincial levels.

CONCLUSIONS

The Korean Government and agricultural cooperatives have made efforts to support small farmers. The support services have contributed to enhancing the living standards of farmers and welfare level in rural areas. Changes in the agricultural environment have affected the agricultural support system. Consumers' preferences are changing rapidly and their demands have become complex. Requirement for safe foods and convenience foods have increased. Trade liberalization and the development of information technology have made competition fierce in the market. These changes have altered the support system from a production-oriented one to a market-oriented support system.

To sell agricultural products in the market, farmers need to introduce new production technology to satisfy consumers' needs. Agricultural marketing has to be reorganized to address the convenience of consumers. Therefore the role of the support system need not be limited to just enhancing farm production. Rather, the agricultural support system should contribute to helping farmers sell their products in the market. It should also provide farmers with information about the changes in the market. And it should support and equip farmers to effectively respond to these changes.

The cooperation between government and agricultural cooperatives is also important. These two organizations have worked closely in partnership for facilitating support for small farmers. The government helps the cooperatives by providing financial and legal assistance, and the cooperatives act as distribution channels of support services provided by government. The government and agricultural cooperatives cooperate in order to maximize support. Therefore, there is need to coordinate the support programs between government and cooperatives. The cooperation between these two agencies will prevent duplication and provide services more effectively.

REFERENCES

Choi, Jung-sup, 2000. *Situation and Prospects of Korean Agricultural and Rural Society*, Korea Rural Economic Institute.

Huh, Gill-Haeng, 1999. "Marketing Improvement of Fruits and Vegetables at Producing areas of Korea", *Journal of Rural Development* 23, Korea Rural Economic Institute.

Kim, Jeong-Ho, 2000. "Prospect of Korean Agricultural Policy", *Journal of Rural Development* 23, Korea Rural Economic Institute.

Ministry of Agriculture and Forestry, 2001. *Annual Report 2000*.

National Agricultural Cooperative Federation, 1998. *Agricultural Cooperatives in Korea*.

----------, 2001. *Annual Report 2000*.

OECD, 1999. *Review of Agricultural Policies in Korea*, OECD Publications.

Park, Dae-Shik, 1999. "Welfare Programs for the Rural Elderly in Korea", *Journal of Rural Development* 22, Korea Rural Economic Institute.

9. MALAYSIA

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INTRODUCTION

During the last two decade, the Malaysian economy has experienced rapid transformation from an agrarian economy to an industrialized economy. Despite the structural change, agriculture sector continues to play an important role both in terms of contribution to GDP and employment generation. In 2000, the agriculture sector accounted for 8.8 percent (RM18.166 million) of the GDP and 15.5 percent of the labor force. In order to accelerate growth of the agriculture sector, there is a need to strengthen the institutional agricultural support services. These services are crucial to enable small farmers to take up commercial farming, adopt new technologies and enhance productivity. Some key elements that need to be examined include human resource development (HRD), technology transfer, research and development (R&D), infrastructure strengthening and financial incentives.

In the smallholders' category, agricultural demand is high but the market is restricted. Currently farmers produce goods only for the local market such as the wet market, '*pasar tani*' and mini market. They plant, harvest and sell the produce themselves. There is need for farmers to develop their marketing skills and further enhance production techniques. At present only a small percentage of farmers can recognizing the potential of supplying products in large amount such as for the hotel industry, restaurants, hypermarkets and for export.

Several programs have been implemented to modernizing the agriculture sector and to maximize the farmers' income. Modernization of small farmers was achieved through promotion of group farming activities as well as through the provision of infrastructural support services. *In situ* development, through rehabilitation and consolidation of existing agricultural landholdings, continue to be the main strategy for agricultural development. Furthermore, new land development is being undertaken primarily by the State and regional agencies as well as the private sector (Table 1). In addition, government also provides the necessary institutional support services and appropriate incentives including tax incentives. These are offered to facilitate private sector participation in large-scale commercial farming especially for food production as well as for floriculture and acquaculture activities.

Table 1. Replanting, Land Consolidation and Rehabilitation Programs by Agency, 1996-2005

(Unit: ha)

Agency	7th Malaysia Plan (7MP)			8th Malaysia Plan (8MP)	
	Target	Achieved	Percent Achieved of Target	Target	Percent of Total
Replanting					
Rubber Industry Smallholder Development Authority	139,315	137,472	98.7	109,260	11.4
Federal Land Development Authority	54,548	43,963	80.6	111,682	11.7
State Economic Development Corporations/Authority	16,788	11,294	67.3	20,054	2.1
Department of Forestry, Sarawak	10,000	9,000	90.0	257,500	27.0
Sarawak Land Development Board	5,574	4,541	81.5	-	-
Sabah Rubber Fund Board	4,490	4,498	100.2	7,000	0.7
South Kelantan Development Authority	1,311	1,121	85.5	7,928	0.8
Department of Agriculture, Sabah	595	830	139.5	4,910	0.5
Department of Agriculture, Semenanjung Malaysia	1,600	1,609	100.6	7,800	0.8
Regional Development Authority	202	202	100.0	3,220	0.3
Sarawak Land Consolidation and Rehabilitation Authority	-	-	-	3,000	0.3
Sub-total	234,423	214,530	91.5	532,354	55.8
Land Consolidation and Rehabilitation					
Department of Forestry, Sabah	250,000	138,433	55.4	258,000	27.0
Federal Land Consolidation and Rehabilitation Authority	27,500	25,237	91.8	25,097	2.6
Sarawak Land Consolidation and Rehabilitation Authority	12,154	11,687	96.2	50,398	5.3
Department of Agriculture, Semenanjung Malaysia	2,540	4,544	178.9	87,562	9.2
Malaysian Cocoa Board	530	1,094	206.4	1,000	0.1
Sub-total	292,724	180,995	61.8	422,057	44.2
Total	527,147	395,525	75.0	954,411	100.0

Source: 8MP, Economic Planning Unit, Malaysia.

ORGANIZATION OF AGRICULTURAL SUPPORT SERVICES

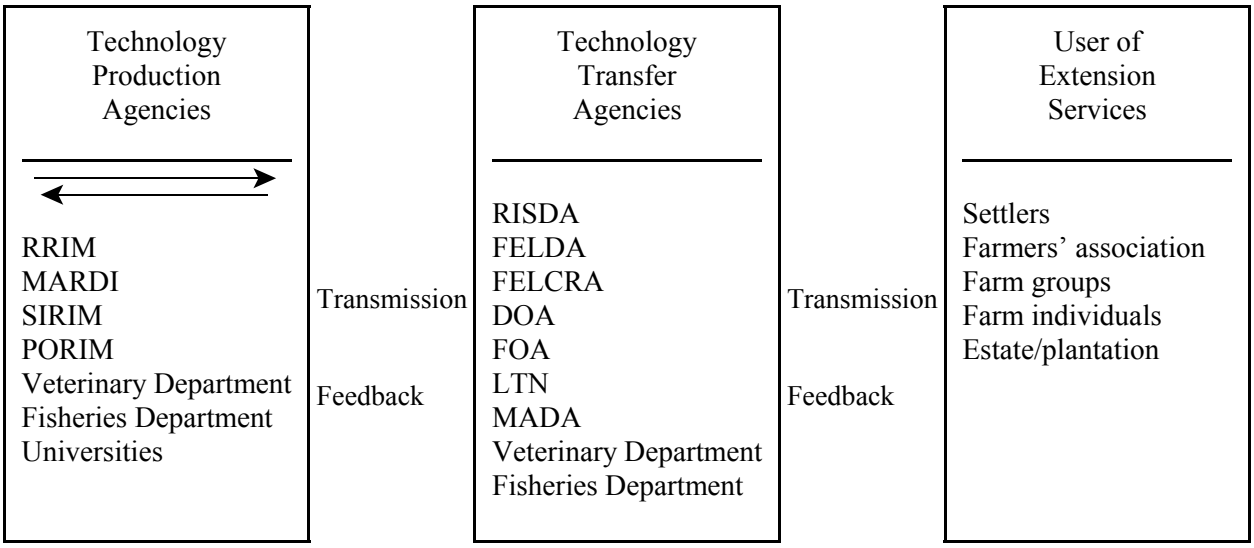

Figure 1. Agencies Involved in the Agricultural Support Services

Source: Ministry of Agriculture, Malaysia.
Notes: RRIM Rubber Research Institute of Malaysia;
MARDI Malaysia Agricultural Research and Development Institute;
SIRIM Standards and Industrial Research Institute of Malaysia;
PORIM Palm Oil Research Institute of Malaysia
RISDA Rubber Industry Smallholder Development Authority;
FELDA Federal Land Development Authority;
FELCRA Federal Land Consolidation and Rehabilitation Authority;
DOA Department of Agriculture;
FOA Farmers' Organization Authority;
MADA Muda Agricultural Development Authority.

Basically, the agricultural support services consist of several elements such as R&D, extension services, marketing, training, credit facilities as well as institutional support. All of these can be categorized into three main groups. The first group is responsible for R&D of all agricultural production technologies. R&D efforts will emphasize the development of more end-products from agricultural by-products and waste. In addition, R&D will focus on establishing means to increase the local processing of agricultural produce and on modern technology to improve productivity and quality, as well as on commercialization of R&D findings.

The second group is responsible for dissemination of such technologies, namely; through extension and training services. In line with the knowledge-based economy, agricultural extension services and training will emphasize modern agronomic practices, management and techno-preneurship incorporating the use of Information and Communication Technology (ICT) and modern technologies to improve productivity. In the process of disseminating such technologies, feedback is also obtained from the farmers' groups on their problems and these are fedback and channelled to the first group for R&D.

MAJOR AGRICULTURAL POLICIES ON RESEARCH AND DEVELOPMENT IN AGRICULTURE

Research and Development

The R&D activities will focus on the development of new end-products and greater utilization of agricultural commodities in order to sustain production as well as to increase local processing. The application

of modern techniques and technologies will be given emphasis whereby R&D on food crops and high-value crops will be intensified particularly through biotechnology and genetic engineering techniques. Research on vegetables will concentrate on developing better planting techniques and technologies while research on fruits will focus on propagating high-yielding clones. Research activities will also be directed towards increasing productivity and modernizing both the fisheries and livestock sub-sectors.

R&D activities in terms of product innovation will also be intensified. An example is that of palm oil, whereby the Malaysia Palm Oil Mill Board (MPOB) has managed to develop high-yielding dwarf oil palm. As a result, new products such as enriched margarine and oil blends including products from the blending of palm oil with goat milk was developed.

Marketing

Marketing of various food commodities will be improved through an integrated marketing system and the provision of better marketing infrastructure. Furthermore, market information networks will be strengthened to provide up-to-date information to farmers, fishermen and traders.

Training and Extension Services

Training and extension services will be further intensified to reorient farmers in the latest farm management practices. Besides, such extension services also provide an avenue to the farmers to inculcate latest technologies and practices that could increase productivity and improve quality of agricultural produce.

Technology Transfer

To ensure a faster pace of technology transfer within the agriculture sector, structural adjustments adopted include the establishment of agro-technology parks in several states to promote the implementation of high technology agricultural activities by the private sector. To enhance land use intensity, new planting techniques, use of rain shelters and organic farming will be encouraged for the cultivation of fruits and vegetables. Furthermore, production of seedlings developed through advanced technologies such as genetic engineering technology and metabolic pathway engineering will also be undertaken in these agro-technology parks.

Credit Facilities

Financial institutions will continue to provide credit to farmers and farmers' organization to enable them to venture into new agricultural activities as well as to mechanise their existing operations. For example, the RM300-million Fund For Food (3F Scheme) was set up on 30 October 1992 to promote investment in new productive capacity in food production. The scheme provides finance at reasonable cost for: (i) primary food production – including fisheries, animal husbandry, vegetables and fruits,; (ii) related food products – covering mainly processed food, provided the raw food materials are sourced from domestic source; and (iii) efficient distribution of food and food products. Individuals or companies can obtain finance up to 90 percent of the project cost for a maximum of eight years beginning from the first draw-down date of the funds from Bank Negara. Small-, medium- and large-sized food projects are eligible to apply for finance. The minimum size of project which Bank Negara will fund is RM10,000 and the maximum RM3 million (exceptions are possible).

In terms of infrastructure facilities, the rural water supply coverage is estimated to increase from 77 percent of rural population in 1995 to 83 percent in the year 2000, which will further boost the irrigation requirements of the agriculture sector.

RESTRUCTURING OF AGRICULTURAL AGENCIES

With the existence of many agencies under the Ministry of Agriculture, the agencies encounter overlapping of functions. In order to promote effectiveness of the agricultural institutions, several agencies were restructured during the last five years. The Malaysian Rubber Exchange and Licensing Board (MRELB), Malaysian Rubber Research and Development Board (MRRDB) and the RRIM were amalgamated into a single body called the Malaysian Rubber Board (MRB). MRB's core task is to integrate development of the rubber industry. Similarly, the PORIM and Palm Oil Registration and Licensing Authority (PORLA) were

merged to form the Malaysian Palm Oil Board (MPOB). Further, FELDA, FELCRA and RISDA reorganized their management functions towards corporatization in order to improve their efficiency and effectiveness.

STRENGTHENING PRIVATE AND PUBLIC SECTOR COOPERATION

A close working relationship and good cooperation between private and public sector is vital in order to revitalize and realign the future direction of the agriculture sector. Strengthening consultative and collaborative mechanisms between private and public sector will enable a speedier process of communication that will lead to a more efficient working relationship. It will also create a more structured environment that will encourage greater collaborative participation in activities such as R&D, market intelligence gathering and promotion, HRD and other related activities. Furthermore, such mutual understanding between both sectors will encourage greater willingness to share information, expertise and technology that will ultimately benefit the sector.

All these benefits are achieved by the establishment of a Private-Public Sector Coordination Council to oversee and coordinate the implementation of the Third National Agricultural Policy (1998-2010) (NAP3). This Council may establish various working groups to plan and implement the development of the sector and the key industries. Members of the Council would include representatives from both Federal and State governments as well as from the private sector. The Ministry of Agriculture and the Ministry of Primary Industries have also launched a secretariat in each Ministry to provide institutional support to the Council. It is the secretariat's task to develop networks with the private sector and the State governments. The Ministry of Agriculture has also set up a one-stop center to serve the needs of the private sector. This center will be electronically linked to other relevant focal points to allow for more efficient communication.

ROLES PLAYED BY THE NGOS AND PRIVATE SECTOR

The economic crisis experienced by Malaysia in 1997 has taught the nation to be self-sufficient in food production so as to curtail the outflow of foreign exchange (Ringgit) for food imports. To achieve self-sufficiency in food production, it is necessary to revitalize the agriculture sector through inter-linkages between various government agencies and NGOs. This is to ensure that transparency is observed in the capacity building process between the government agencies and the NGOs. The role of the NGOs is to serve as intermediaries in ensuring that the implementation of agricultural programs is not carried out at the cost of society and the environment.

Hence as outlined under the NAP3, there is need for greater participation by the private sector rather than sole dependence upon the government to provide momentum to the development of small farmers.

FUTURE PROSPECTS FOR AGRICULTURAL SUPPORT SERVICES DEVELOPMENT

Future prospects for agricultural support services in relation to declining agricultural population and agricultural land will focus on sustainable agriculture to optimize resource inputs. Hence, priority will be given to R&D programs which will focus on the following areas:

* Development of high-yielding, high performance and superior quality crops, livestock, aquatic varieties and breeds.
* Widening the substitution of labor for capital through the development of mechanized and automated systems especially in labor-intensive production operations.
* The current tight labor market together with the lack of interests in taking up farming as an occupation by the younger generation will compel future farmers towards acquiring skills and knowledge which are capital-intensive and technology-oriented. Some of these programs include basic mechanization, handling of 2-wheeled tractors, tractor driving and short-term crop protection.
* Future agricultural development will see greater linkages between both the upstream and downstream activities. Hence the integration of agriculture with the manufacturing sector will be instrumental in

providing a balance inter-sectoral growth due to the synergistic effect of the two sectors complementing each other in the overall industrialization process.

* In terms of marketing perspective, more aggressive marketing campaigns into new markets will be pursued. Simultaneously, greater accessibility to existing markets will be achieved through both bilateral as well as multilateral negotiations as well as improvements through market research, market intelligence and market information dissemination systems.

ISSUES AND CHALLENGES

The issues and challenges faced by the agriculture sector in line with the productivity thrusts to be adopted can be examined from the following perspective, which include skills enhancement, systems improvement, technological breakthrough and improvement in institutional support.

* *Enhancing the Skills and Knowledge of the Agricultural Front-liners*: The adoption of electronic agriculture (*e*-agriculture) will facilitate the creation of a 'virtual community' within the farming community. Such 'virtual community' provides information and knowledge pertaining to agriculture to be shared among the community not only at the national level but also across global frontiers.
* *Continuous Modernization at the Farm Level*: In view of the continuous labor shortage faced by the agriculture sector, the long-term solution is to modernize the farms rather than depend solely upon foreign workers to ensure the long-term sustainability of the agriculture sector.
* *Optimizing Land Usage through Integrated Farm Management*: With continuous conversion of prime agricultural land for industrial purposes, productivity enhancement can be further improved through optimizing land usage by having a wider crop mix, which not only improves farm income but also maintains soil fertility. Such integrated farming systems allow productivity gains to be achieved from existing cultivated acreage rather than expansion in planted area. Land consolidation and rehabilitation will be further intensified through group farming system.
* *Commercializing R&D Findings for Yield Improvement*: Many R&D institutions have been set up since Independence in 1957 specifically to cater to the agricultural sector. Unfortunately, many of the successful R&D findings carried out by these research institutions could not be commercialized due to lack of support from the private sector. Under the situation, there is a need to set up an effective partnership between both the research institutions and the private sector to jointly implement all R&D findings at the farm level in order to achieve higher yields.
* *Strengthening the Institutional Support*: One of the main problems faced by the farmers is the lack of institutional support resulting in low farm returns. To make farming an attractive occupation in the future, the institutional support system needs to be reorganized to ensure that our farm produce is competitive in the global market in terms of price, quality, marketing and distribution. Table 2 shows the development allocation for the agriculture sector under the current Malaysia Plan.

Table 2. Development Allocation for Malaysian Agriculture Sector, 1996-2005

Program/Sub-sector	7MP Allocation	7MP Expenditure	8MP Allocation
New Land Development	475.9	475.9	274.2
Regional Development	812.9	807.0	570.1
In situ Land Development	3,115.4	2,941.9	2,265.1
Forestry	144.4	143.8	225.2
Fishery	495.8	465.3	414.3
Livestock	223.6	176.3	127.5
Support Services	409.5	354.3	719.0
Irrigation and Flood Mitigation	1,715.6	1,929.9	2,170.2
Other programs	893.8	844.9	1,094.4
Total	8,286.9	8,139.3	7,860.0

Source: 8MP, Economic Planning Unit, Malaysia.

CONCLUSION

The agriculture sector in Malaysia during the last decade experienced major transformation and modernization. Consequently, the government have to re-engineer and restructure the management aspects of the sector. Support services are the basic foundation that need to be strengthened by both public and private sector, and related agencies. The restructuring of agricultural agencies should continue to improve productivity and efficiency of the sector. Clear guidelines need to be provided to the concerned agencies regarding the core tasks. Furthermore, farmers should be given intensive training in line with the "K-Economy". All this will further boost the sector in terms of GDP, labor force, productivity thus making farming an attractive occupation.

REFERENCES

Ministry of Agriculture. *Third National Agriculture Policy (1998-2010)*, Kuala Lumpur.

Ministry of Finance. *Economic Report 2000/2001*, Kuala Lumpur.

National Productivity Corporation. *Productivity Report 2000*, Kuala Lumpur.

Prime Minister Department. *Eighth Malaysia Plan (2001-2005)*, Economic Planning Unit, Kuala Lumpur.

10. MONGOLIA

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INTRODUCTION

Agriculture is the mainstay of Mongolia's 2.4 million people and contributes one-third of GDP. Agricultural and agro-processed exports amount to about one-third of foreign exchange earnings. It is a source of employment for almost half of the population, and the most important source of household income in rural areas. Extensive livestock production is by far the dominant agricultural activity. The continental climate with a short growing season, sharply defined seasons, and low rainfall are the overriding constraints of Mongolian agriculture, and are contributing factors to relatively fragile ecosystems.

Mongolia's agriculture sector comprises: (i) a livestock sub-sector, consisting mainly of extensive livestock production based on the seasonal migration of mixed herds of sheep, goats, cattle, and camels, and some intensive livestock production with housed dairy cattle, pigs and poultry; and (ii) a crop sub-sector concentrated on the production of wheat, the main staple food. Crop production mostly takes place on relatively large, extensively managed and mechanized farms in the north-central region around Ulaanbaatar. Horticulture production comprises mostly potato and vegetables, and is increasingly based on small family plots and some commercial greenhouses.

The transition process from the centrally planned economy to the market economy had a dramatic impact on agriculture. With the removal of the support structure previously provided by the State, the agriculture sector contracted sharply in the early 1990s. However, by 1995 it had recovered to its 1989 level in real terms, and in 1998 it was 14 percent above this. As of 1999, agriculture's share in GDP was 36.1 percent. Within agricultural output, the share of livestock sub-sector increased from 77 percent in 1989 to 90 percent in 1999, while the share of the crop sub-sector declined from 23 percent to 10 percent. Employment in agriculture rose significantly, from 33 percent of total employment in 1990 to 48.5 percent in 1999 (National Statistical Office of Mongolia, 2000).

Crop Sub-sector

During the late 1980s Mongolia was more than self-sufficient in wheat. For many years large State subsidies had stimulated the conversion of pastureland to cropped land, including very marginal areas. In 1989 530,000 ha was sown with wheat.[1] By 1999 this had declined by almost a half to 273,000 ha. The areas planted to other crops, such as potatoes and fodder, had also declined considerably. As a result, crop output in 1999 was significantly below 1989 levels. Wheat output was a quarter, and fodder output 1 percent of the 1989 level. Only potato and vegetable output showed some increase in the last few years. Average yields also declined significantly during the 1990s. Wheat yield fell from 1.3 mt/ha in 1989 to 0.6 mt/ha in 1999 although yields varied widely across province (from 0.17 mt to 1.5 mt/ha) and across farms, reaching over 2.5 mt/ha.

Poor quality seed is a major contributing factor for low yields. For several years, little commercial seed was available in the market, farmers used farm-saved seed of poor quality and outdated varieties. Other factors include exhausted soils, little use of fertilizers or pesticides, and failing machinery. While the demand for credit is high, in particular to buy inputs and minor equipment at the beginning of the cropping season, little credit has been available for crop farmers over the last few years. The limited expertise of some of the new, private farmers also has contributed to the decline in yields.

[1] Wheat production is mainly carried out using the mono-cropping strip system, which involves leaving a significant proportion of the land fallow in each year for cropping in the following year.

By 1999, most of the State farms were fully privatized, with about 80 percent under single (either individual or company) ownership. There are now about 300 farms with several thousand hectares and many smaller farms with several hundred hectares. An increasing share of vegetable production is taking place on small plots by households, mostly near urban centers. Vegetables are also grown commercially on some of the irrigated land, currently about 4,200 ha.

In the pre-transition period, processing of crops largely involved the milling of wheat into flour and its use for bread and bakery production, the distilling for alcohol, spirits, and other beverage manufacture, and the production and manufacture of fodder. During the 1990s processing activities fell sharply. Flour production is now one-third, and bread and bakery production a quarter of their 1989 level. Manufactured fodder in 1998 was at 10 percent of the 1989 level, largely due to the collapse of intensive livestock production.

Exports of crop products have essentially disappeared, while imports including wheat, flour, potatoes, and vegetables are steadily increasing, and now account for about 10 percent of total imports. The import requirements for wheat in 1999 amounted to more than 50 percent of the country's wheat needs. During the 1990s, wheat and flour imports have largely been commodity aid-funded by the United States and Japan.

Livestock Sub-sector

Prior to 1990, pastoral livestock was held within State-controlled collectives (*negdels*) each of which comprised the area of one district. Individual households were allowed to keep a small number of animals for personal use. The *negdels* employed herders as salaried workers, provided the necessary supplies and technical advice, marketed the produce, and offered various social and cultural benefits. During the first wave of privatization in 1990/91 the collective herds were distributed to *negdel* members. Since then total livestock numbers have steadily increased, from 25 million in 1989 to 34 million in 1999, representing an increase of 36 percent. With the increase in livestock numbers herd composition also changed. Between 1989 and 1999 the number of camels declined by 36 percent, sheep remained relatively stable, horses increased by 11 percent, cattle increased by 38 percent, and goats by more than 120 percent to 11 million head. The strong increase in the number of goats reflects the income opportunities from cashmere.

In contrast to the extensive livestock sub-sector, intensive livestock production has experienced a sharp decline. With their reliance on imported high supplement feed, exotic species, and heated housing during winter (especially for pigs and poultry, less for dairy cows) many production units became unviable with the loss of subsides.

Processing of livestock products strongly declined during the 1990s. Meat products in 1999 amounted to only 10 percent of their 1989 level. Similar declines occurred in the processing of fibers (cashmere, camel hair, and wool) and hides and skins (cattle, horse, goat, and sheep). Export of many livestock products also dramatically declined. Meat export fell from 30,500 mt in 1989 to 2,200 mt in 1995, and then recovered to 7,500 mt in 1999. However, export of unprocessed cashmere, and hides and skins in raw form continue to do well.

The continuous increase in livestock numbers over a favorable climatic period during the 1990s came to a dramatic halt in the winters of 1999/2000 and 2000/2001. Following unusually dry summers, the winters in the last two years were very harsh. About 2.7 million livestock or 8 percent of the total stock did not survive the cold in winter of 1999/2000. An estimated 50,000 households were affected by livestock losses. Many were households with small herds and little experience in herding. About 2,000 households lost all their livestock.

In the early phase of the disaster, the government released strategic reserves of fodder and fuel to affected provinces and distributed relief items such as flour and tea. The State Emergency Commission organized the delivery of hay and fodder to the worst hit areas.

SMALL FARMERS: THEIR SIZE AND COMPOSITION

During the centrally planned economy, very few large central farms and *negdels* (a form of cooperative) were operating in the agricultural production sector. In the 1990s, the government initiated a large number of measures within the framework of agriculture sector reform. Privatization was the centerpiece of the reform. Privatization in the livestock and crop sub-sectors was carried out differently.

In the livestock sub-sector, the herds were given to the members of *negdels*. While 31.9 percent of total livestock were State property in 1990, by 1996 about 93.4 percent of the herds had been privatized.

In the crop sub-sector, many of the large farms and cooperatives located in rural areas were split into three or more individual private company units, or smaller cooperatives. These units were given land area of 10 ha up to several thousand hectares. At the same time, individual farmers were given smaller plots of 1-5 ha to farm on their own account.

As a result of privatization, most of the agricultural producers are now household herders and own small farms. Currently, over 80 percent of the total livestock is owned by households, majority of crop products are produced by small companies, cooperatives, sole proprietors and individuals. Table 1 shows number of livestocks owned by households, and Table 2 shows area and production/productivity of different crops.

Table 1. Numbers of Households by Number of Livestock

Number of Livestock	1990	1995	1996	1997	1998	1999	2000	Number of Livestock (000 head) 2000
Up to 10	76,437	43,694	39,778	35,530	31,668	28,669	31,361	184.0
11-30	88,035	50,580	47,080	41,009	36,837	35,970	40,436	833.1
31-50	42,647	40,200	37,462	34,784	33,733	31,874	35,041	1,431.5
51-100	42,548	61,082	61,464	63,774	62,941	61,347	63,096	4,714.6
101-200	10,714	53,564	55,383	65,282	67,466	67,840	59,821	8,424.9
201-500	492	31,393	32,983	34,539	36,275	37,635	33,408	9,607.5
501-999		3,095	3,678	4,137	5,112	5,438	4,591	2,870.7
1,000-1,499		280	445	531	860	1,061	893	1,004.7
1,500-2,000		17	32	54	62	75	48	79.5
2,001 and over		8	10	14	33	41	37	85.9
Total	260,873	283,913	278,315	279,654	274,987	269,950	268,732	29,236.4

Table 2. Agricultural Area, Production and Yield of Major Crops

	Total			From which:					
				Companies and Cooperatives			Individuals and Sole Proprietors		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
Area Sown (000 ha)									
Cereals	306.9	279.1	194.7	274.3	251.8	177.2	32.6	27.3	17.5
Wheat	301.1	273.1	191.4	270.9	247.6	175.4	30.2	25.5	16.0
Potatoes	8.1	8.8	7.9	3.3	3.2	2.7	4.8	5.6	5.2
Vegetables	5.5	4.8	5.4	1.9	1.2	1.4	3.6	3.6	4.0
Fodder crops	4.9	1.7	0.8	2.1	1.1	0.6	2.8	0.6	0.2
Total	325.4	296.3	208.8	281.6	257.1	181.9	43.8	37.1	26.9
Production (000 mt)									
Cereals	194.9	169.5	142.1	177.6	156.4	133.9	17.3	13.1	8.2
Wheat	191.8	166.7	138.7	176.3	154.5	132.3	15.5	12.2	6.4
Potatoes	65.2	63.8	58.9	25.5	17.6	18.4	39.7	46.2	40.5
Vegetables	45.7	39.0	44.0	13.6	9.1	12.8	32.1	29.9	31.2
Fodder crops	667.0	715.2	689.4	125.1	104.0	209.9	541.9	611.2	479.5
Yield (kg/ha)									
Cereals	635.1	607.3	729.8	647.5	621.1	755.6			
Wheat	637.0	610.4	724.7	650.8	624.0	754.3			
Potatoes	8,049.3	7,250.0	7,455.7	7,727.3	5,500.0	6,814.8			

The privatization of *negdel* livestock resulted in a nearly threefold increase in the number of herders (from 148,000 in 1990 to 418,000 in 1999). Similarly, the number of households whose primary source of income is derived from herding more than doubled (from 69,000 in 1989 to 197,000 in 1998) and is now equivalent to about 40 percent of the population. Strengthened by the overall growth in livestock numbers, herd size has increased substantially. Following privatization in 1990, about 80 percent of households with livestock owned less than 50 animals, and only 4 percent owned more than 100 animals.[2] By 1999, the number of households with less than 50 animals increased to 41 percent. In addition, the spread of households' herd sizes increased. In 1999 more than 1,200 households had more than 1,000 animals; the majority of herder households had only enough animals to live on a subsistence basis.

PRESENT SITUATION OF AGRICULTURAL SUPPORT SERVICES

Veterinary and Breeding Services

Veterinary and breeding services are fully privatized. There are currently 454 veterinary and breeding service entities, of which 335 are privatized former State-owned units and 119 are newly established private entities. These entities provide diagnostic services, disinfections treatment, preventive measures and other services on herders' requests. Furthermore, they are the basis of hygiene control, issue permits for sale and export of livestock raw materials and products. There are 388 veterinarians with higher education, 312 veterinarians with vocational education, and 67 zoologists in total. Because of inadequate supply of necessary drugs and other reasons, the veterinary services cover only one-third of all livestock.

The veterinary service entities function on a self-funding basis. Depending on the number of livestock in the local area, demand for the service, local geographical and environmental conditions, the profitability of the veterinary service entities vary largely. Generally it is very difficult for the entities to operate on their service income; there are many entities that are unprofitable. Although, according to the "Livestock Gene Fund and Health Protection Law" of Mongolia, preventive measures for infectious diseases are to be financed by the local budget, this is not being adhered to in practice. In many cases veterinary service entities are not able to collect fees for the service provided to herders, which causes difficulty in their proper operation. On an average, a veterinary service entity's net profit per year is 249,741 tugrik.

With the privatization of veterinary service units and the emergence of new ones, competition for providing quality service and gaining market share has increased. However, professionalism among private veterinary practitioners needs to be increased, and the system of their remuneration revised to reflect their role as service providers in a market economy. In the area of vaccination policy, the government must concentrate its limited resources on effective control of a limited range of key diseases rather than pursuing an ineffective program aimed at the complete coverage of livestock diseases.

Extension and Training

Agricultural extension services have recently emerged in Mongolia as a result of the policy reform in the sector. Extension services are of great importance to small farmers who have little or no experience on the various aspects of a market economy.

An Agricultural Extension Center was established at the end of 1996. However, its operation started only in 1998. The Center's objectives are "to assist all agricultural entities under all forms of ownership (public or private) in implementing scientific and technological findings and advanced technologies and in running profitable business, improving professional capacities and skills by the provision of professional, consulting, and training services or acting as intermediary".

The Center is currently providing information dissemination, training and consulting services and is working with projects funded by international or bilateral aid agencies. It is expanding its activities by setting up extension service network with branches in *aimags*. Organizational structure of the Extension Center is illustrated in Figure 1.

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[2] A herd of about 100 animals is generally considered as the minimum size for a self-sustaining household, although the number varies considerably according to geographic area and species mix. Herding households with less than 100 animals have been assessed as below the poverty line. Such herders are considered unsustainable and doomed to decline as the offtake exceeds the reproduction rate.

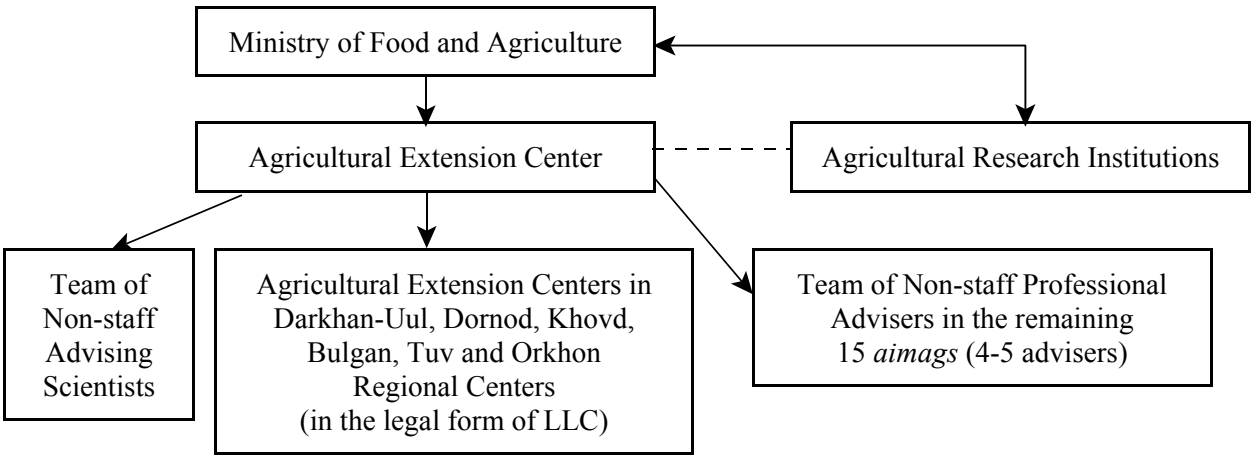

Figure 1. Organizational Structure of the Agricultural Extension Center

The central office of the Extension Center in Ulaanbaatar has 13 employees, has a team of 30 advising scientists with a representative from all agricultural professions. It also works closely with agricultural research institutes. So far, six regional centers are set up, which function in the form of State-owned limited liability companies. In the remaining *aimags*, there are teams of professional advisers that work closely with the Extension Center in Ulaanbaatar. The Center provides training to all its local advisers. It provides training to 1,000-1,500 persons yearly, issues information bulletins, advises agricultural producers and helps in setting up database of technologies to be implemented. All the Extension Centers are currently financed by government budget. However, there is a plan to make these centers self-financed.

Rural Financial System

Prior to 1990, all banking transactions in Mongolia were carried out by the State Bank, which also acted as the central bank. The agriculture sector was supported through a complex system of subsidized and directed credit with the costs being largely borne by the financial sector, the national budget, and some countries of the Council for Mutual Economic Assistance. In 1991, the functions of the State Bank were transferred to the Bank of Mongolia (BOM) now acting as the central bank, and several newly established commercial banks. During the 1990s, several major financial crises were experienced, the last in 1998. Partly as a result of these the financial sector continues with substantial assistance.

At the beginning of 2000 Mongolia had 12 banks. Of these, the Agricultural Bank has by far the largest rural network with branches and sub-branches in most provincial and district centers. During the most recent banking crisis, the Agricultural Bank became insolvent, and in 1999 BOM placed it under conservatorship and later receivership. Lending activities were stopped, but other services including the distribution of salaries and pension payments continued. A restructuring plan was finalized, and a business plan prepared with the aim of transforming the bank into a commercially viable entity. Following recapitalization in mid-2000, control of the Agricultural Bank passed to a new board of directors and executive management, including two United States Agency for International Development (USAID) funded staff. BOM initiated lending activities by the end of 2000.

The Post Bank has the second largest branch network and is in the process of expanding its rural presence. It currently offers a limited amount of short-term credit to larger agricultural enterprises from its headquarters. In the first quarter of 2000, the Post Bank received a BOM permit for lending in six provinces, trained its rural credit officers and started rural lending by the end of 2000. The Zoos Bank and Erel Bank are among a small group of banks that have a limited branch network. They provide some financial services to rural clients, mostly to agricultural marketing and processing companies.

Mongolia's non-bank financial sector comprising savings and credit cooperatives, finance companies and leasing companies, is at a nascent stage of development. Two of these non-banking financial companies – XAS and Goviin Ekhlel, are active in rural areas and recently, they have announced that they will be merging into one organization.

Currently little credit is available for people in rural areas. Interest rates are high in real terms, ranging from 2.5 to 5 percent per month for commercial banks and about 10 percent per month at pawnshops, but is slowly declining as the financial system recovers. A recent study[3] shows that about a quarter of rural households have bank accounts, which are mostly used for receiving pensions, salaries, and other transfers. Savings mobilization is constrained by the perception that banks have limited credibility. About 80 percent of the rural households claim that they are in urgent need of reliable financial services, and that they are looking for safe savings options as well as credit opportunities. Delivery of financial services and improved access to credit for the rural population is a key requirement for restoring economic growth and employment in rural areas, and coordinated aid to strengthen the rural financial system continues to be essential.

Agricultural Marketing and Trade System

The privatization of livestock and crop farms was carried out before the restructuring of input and output marketing, which is needed to provide incentives and channels for increased agricultural activity. Partly because of market logistics and low monetization, subsistence production in rural areas, barter transactions, and kind wage payments are common. With the shortage of cash and a high-risk production environment, producers are reluctant to use inputs that are not absolutely necessary. This, together with the lack of price differentiation for higher quality raw materials, is contributing to low productivity and poor product quality.

Processing plants especially for livestock raw material, use a system of procurement agents and act as monopolistic buyers in small rural markets. Producers often receive not cash but kind, usually in the form of households consumption goods on which terms of trade are heavily skewed in favor of the agents. Many herder households are isolated during the summer when most buying takes place, and have little price information or access to markets. The agent's willingness to buy small quantities of fiber or a few animals for trekking to slaughter can be attractive to a herder with only a few animals and little market power. So far agricultural producers have received limited advice on how to cooperate to improve their bargaining position. However, in some regions cooperative marketing is increasingly being used to improve returns for producers.

The marketing of agricultural raw material follows a highly seasonal pattern. Cashmere is usually marketed in May, wool in July, wheat in September, and livestock in autumn. Due to lack of working capital, many processing plants have experienced difficulty in reestablishing their export channels. Export opportunities in the meat products industries are particularly constrained by the absence of standards and qualified, licensed veterinarians to supervise meat hygiene and production.

New initiatives are emerging in the marketing and trading of agricultural products with the organization of experimental cashmere auction in Bayankhongor *aimag* by "Cashmere Classifying Auction Center" project supported by the UNDP. This activity was very new to both producers and buyers, however, it made a good start for a new way of agricultural product marketing and trade.

Other Support Services

Some efforts have been undertaken to introduce commercial seed multiplication but this has had little impact on the availability of quality seed, and farmers are forced to use farm-saved seed of poor quality and outdated varieties.

Research and development activities are mainly carried out by the agricultural university and research institutes. The Ministry of Food and Agriculture (MFA) issues list of topics/areas to be researched and research and development projects are selected on a competitive basis based on proposals submitted by interested institutions. The selected projects are financed by the State Science and Technology Fund.

Role of the Government in Providing Agricultural Support Services

1. ***Existing Organizational Setup***

During the last decade, a series of major changes were introduced in the institutional setup of agricultural and agriculture-related agencies nationally and locally. In devolution of administrative control

[3] JICA (Japan International Cooperation Agency) and Ministry of Finance, Mongolia, 2000, *Rural Banking and Saving Mobilization: Study on the support for the Economic Transition and Development of Mongolia*.

to the local level during the early 1990s, the government transferred several agricultural functions to the 22 provincial governments.

In 1996, the MFA and the Ministry of Industry were amalgamated to form the Ministry of Agriculture and Industry. However, following the elections in July 2000 in which a different political party won, the government structure was again reorganized. The former Ministry of Agriculture and Industry was split into the Ministry of Industry and Trade and the MFA.

The MFA's function is policy formulation, regulation, monitoring and evaluation. It does not have any direct involvement in agricultural production and support activities. The structure of government agricultural support services is grouped either in implementing or regulatory functions within two main agencies under the Ministry. Government organizational setup is shown in Figure 2.

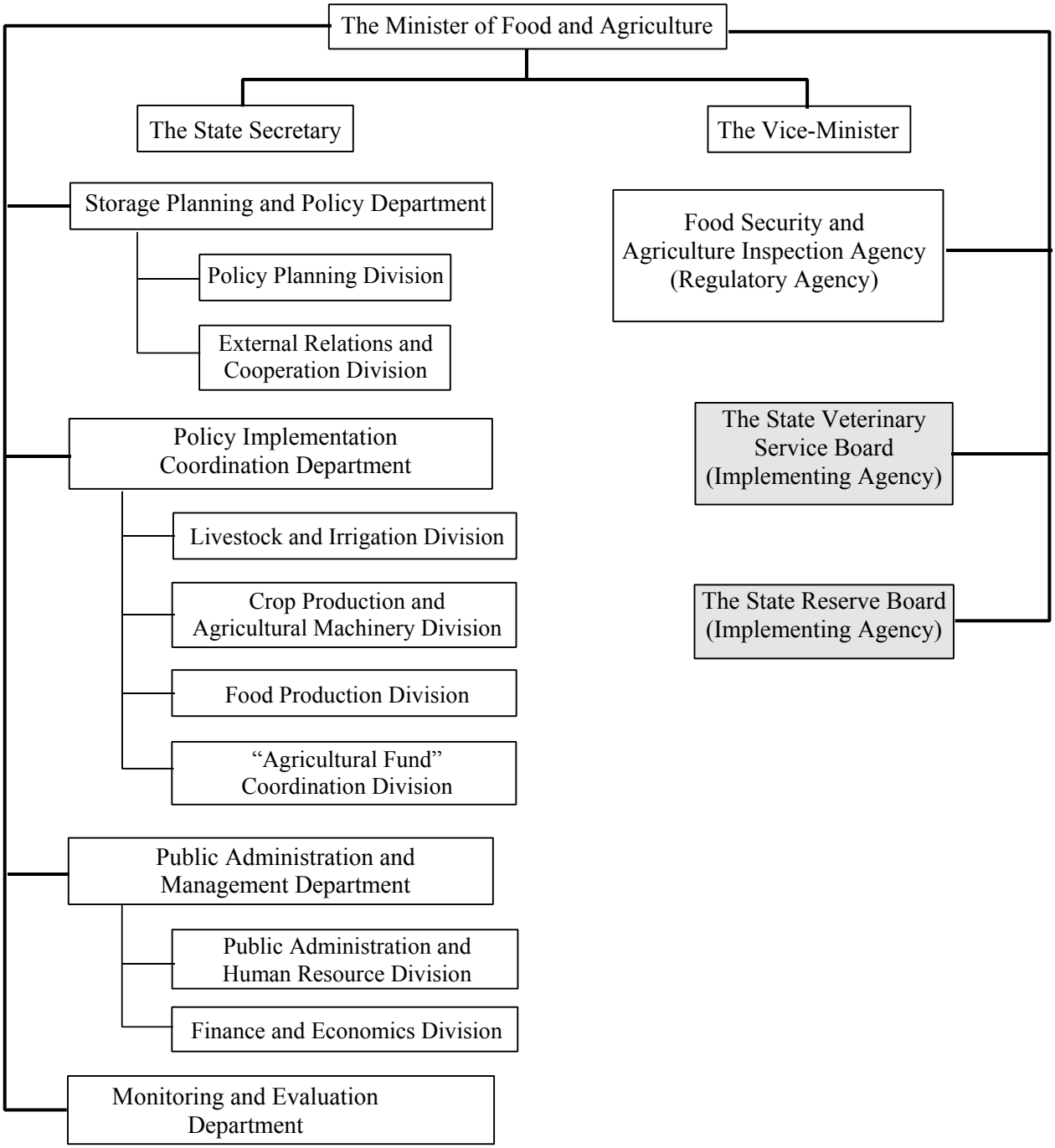

Figure 2. Organizational Structure of the Ministry of Food and Agriculture

Policy implementation including the agricultural support services is largely dependent on lower levels of government, i.e., on the *aimag, sum*[4] governor's offices and operating departments under the office. There is a Production, Commerce, Agriculture and Environmental Department in the *aimag* governor's office, which are responsible for all agricultural policy development and implementation within their respective area. There are 1-2 agricultural officers in all *aimag* governor's office, who are responsible for organizing the implementation of the State policy and legislative acts on agriculture, within their *aimags*, via it implementing agencies and *sum* governors. Due to a number of factors such as *aimag* conditions, agriculture sector-specifics and governor's decisions, the staffing and work duties of agricultural division is different in each *aimag*. For instance, in those *aimags* where crop farming has not been developed, there is no need of crop specialists. In *aimags* that have a high development of crop production the services of agricultural engineer, in charge of agricultural techniques are utilized. There is also a Professional Inspection Office (operating agency) in each *aimag* where one agricultural inspector is employed. In addition an Agricultural Board and a Veterinary Board in each *aimag* and city, function as operating agencies and are in charge of implementation of State and local policies working closely with the local private veterinary units.

At *sum* level, there is one agricultural officer in each *sum* governor's office. *Aimag* and *sum* governor's office agricultural officers are in charge of implementation of the Central Government's agricultural policies at local levels and policymaking at local level.

All agricultural support services are provided by public/private entities; most of them are on the basis of self-financing.

2. ***Government Expenditure on Agriculture***

Although agriculture contributes more than one-third of the GDP, only about 1.3 percent of total government expenditure is being allocated for agricultural purposes. In 1999, this amounted to 4,861 million tugrik,[5] of which 4,165 million tugrik was allocated for the national level and 696 million tugrik for the country's 22 provinces. About 10 percent of the agricultural budget at the national level was used for salaries and benefits of staff in the former Ministry of Agriculture and Industry, and its implementing and regulatory agencies. Close to 42 percent, or 1,755 million tugrik, was spent on the supply of free vaccines for herders. The other main expenditure items included the State Reserve (for wheat, seed, and other goods) according for 570 million tugrik, pasture protection from rodents accounting for 230 million tugrik, well rehabilitation 292 million tugrik, and the Green Revolution Program, 180 million tugrik.

Roles of NGOs and the Private Sector in Providing Agricultural Support Services

As has been discussed earlier, due to the extensive privatization program implemented in 1990s, the major agricultural production is carried out by the private sector. However, changes in ownership structure have frequently failed to yield significant improvements in productivity and profitability. This is mainly because supply of inputs, processing and marketing of outputs, and the provision of financial services, which were previously organized and controlled by the State, deteriorated and left a vacuum that has not been adequately filled by the private sector.

The situation is improving gradually with the development of private sector entities, e.g., rural credit. Some areas of agricultural support services entirely rely on the private sector entities, e.g., veterinary services. However, government support is needed to improve the sustainability of these private entities and hence improve the service coverage and quality.

As regards the NGO, there are over 30 such organizations. Half of them are central and local cooperatives' associations, which aim to support the management of the member cooperatives, improve their capacities, provide training, provide market information, and assist the members in marketing and selling their product. There are three veterinarians' and breeders' associations, which aim to support privatized or newly established veterinary units, share their experiences. Other NGOs include Crop Farms Development Fund (aims to develop crop farming in the country, carry out research, studies, and training for farms, provide them with market information and financial support); Association of Farmer Women (support women's

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[4] *Aimag* and *sum* are administrative units. Mongolia administrative units are: in urban areas – city, district and *khoroo*; in rural areas – *aimag, sum* and *bag*.

[5] Exchange rate at the end of 1999 was US$1.00 = 1,070.82 tugrik.

involvement in farming business, provide training, etc.); and Association of Diary Producers (assist in exporting dairy products, help in finding foreign investors and protect their rights in carrying out activities in Mongolia).

Generally, there are very few consistent and active NGOs. The largest of them is the Association of Mongolian Agricultural Cooperatives, which has a training center and a newspaper agency, branches in all *aimags* and have member cooperative in almost all *sums*. The Association issues weekly newspaper "Cooperative News" which serves as a means of information dissemination to members. It closely cooperates with the German Technical Assistance Agency (GTZ) on cooperative training.

Major Issues and Remedial Measures in the Delivery of Agricultural Support Services

Major agricultural reforms introduced by the government in the first half of the 1990s included the privatization of State farms and *negdels*, deregulation of prices of major agricultural products, and liberalization of agricultural trade. Despite substantial progress with reform, there are several key constraints and issues remaining that undermine agricultural performance.

As a result of the institutional changes during the last few years, the emphasis on cost recovery for agricultural support services has increased. But producers often find it difficult to avail of these services because of limited cash availability, the high cost of credit, and adverse terms-of-trade between agricultural inputs and outputs. The outreach of MFA's agricultural extension center is severely curtailed by the lack of staff and budgetary resources. Agricultural research is weak. It provides little tangible support to extension services, and is not oriented to meeting the demand of agricultural producers or processors. To support private sector development, agricultural research services need to be responsive to the demands of producers and processors, and adequately organized and funded. Some success has been achieved with the Green Revolution Program, approved in 1997, which aims to improve supplementary food and income to low-income families by assisting with potato and vegetable production. It relies on the lower levels of government as well as on the initiatives of schools and NGOs in the countryside. It is credited as having contributed to the increased potato and vegetable production that occurred in the second half of the 1990s. The Green Revolution Program can be enhanced by: (i) strengthening the involvement of NGOs by awarding them contracts for program implementation; (ii) focusing benefits on vulnerable groups; (iii) including a broader range of activities; (iv) introducing cost recovery; and (v) establishing a mechanism at the provincial level to ensure that the different programs targeted at vulnerable groups are coordinated.

Cooperative System

By the mid-1990s, many households, especially in rural areas were not able to participate in the emerging market economy. By working on their own and often in isolation, they had few opportunities to pool limited resources and develop favorable market structures. Some of the new herders households who had received livestock during the *negdel* privatization also lacked the professional background to manage these assets. When asked about their most pressing needs, herder and cultivator households, especially in more remote areas, often emphasize that besides improved access to financial services they need better marketing and input supply channels. They are aware that when they bargain on their own with private traders they are receiving relatively low prices for their produce, while they pay high prices for inputs and consumer goods. Many realize that their agricultural activities could be improved if they organized themselves into groups, which needed to be larger than their extended family. Cooperatives are seen by many agricultural and other rural producers as having the potential to expand the local organizational basis needed for economically viable activities such as marketing and processing, thereby providing greater income security and higher returns to their members.

In some regions cooperatives and their associations are now increasing their activities to improve services and provide collective income-earning opportunities for their members. However, the expansion of cooperative activities is currently limited by several constraints. Many rural households still have limited knowledge about cooperative activities in a market economy. Also cooperatives have limited access to operating capital, necessary for processing facilities. Many cooperatives also lack the ability to prepare business plans and the financial expertise to effectively use credit. Due to human resource and funding constraints, the internal management of cooperatives and their cooperative associations is also often weak, and the provision of vital services such as accounting and auditing is limited. The tax treatment for

cooperatives also requires significant rationalization. In remote areas, communication and transport problems pose serious constraints to cooperative development. The legislative and regulatory framework for the development of cooperatives was significantly strengthened with the adoption of the Cooperative Law and the Cooperative Development Program in 1998, however, the program remains largely unimplemented.

Pasture and Well Management

During the last decade, pressure on pastures has been widespread and increasing because of the significant changes in size, structure, and management of the extensive livestock sub-sector. The national herd grew by about 8 million head, or 19 million sheep equivalent units (SEU),[6] and the average stocking rate increased from 0.34 SEU per ha to 0.46 SEU per ha. The main reasons for the growth in livestock number include the need of an increasing number of herder households to secure their livelihood, a significant increase in the price for cashmere, and the absence of any weather-induced catastrophe until the winter of 1999/2000.

Overgrazing and the loss of pasture productivity was recognized prior to 1990, and attempts were made to address the problem by: (i) large-scale provision of supplementary fodder by the state; (ii) heavy investment in the development of wells, bores, and pumps to open up previously underutilized grazing land by providing reliable stock-watering facilities; and (iii) controls on the movement of herders, mostly within a particular district, relying on the authority of *negdel* managers and the district governor. During the 1990s these measures were discontinued. As a result, the fodder supply industry has almost disappeared. More than 40 percent of the wells and bores nationwide have become inoperative due to the lack of maintenance. Pastures that previously were supported by stock-watering facilities are now little used, and herder households who used to rely on these lands have moved to areas with reliable water supplies. Furthermore, not much progress has been achieved in developing the tenure system for pastureland,[7] and controls on herder movements are weak or nonexistent. This has encouraged a significant migration of herder households to areas adjacent to larger towns and cities, and the central region of the country, contributing to local overgrazing and conflicts over pasture rights, especially around population centers and major transportation routes. The former Ministry of Agriculture and Industry in 1998 started a small well rehabilitation program to increase the number of stock-watering points.

Other issues

Many of the new owners have little knowledge, and received little advice on how to manage their assets. Although Mongolia's human resources are high in literacy and technical disciplines, they are limited in terms of entrepreneurial attitudes and skills, accounting, marketing, and other market-oriented business practices. Increasingly, the cooperative movement is seen as providing an important avenue to strengthen the needed human resource skills and management capacity.

Small entities and herders have no experience in running a farm in the free market economy conditions. They lack farm management and entrepreneurial skills. Furthermore, due to poor communication channels in rural areas, many agricultural producers have no access to market information. Therefore improvement of communication systems and training of farmers are needed to be carried out extensively.

The government has received a loan of US$35 million from the Asian Development Bank (ADB) in 1995 to implement the agriculture sector program to support policy and institutional reform and much has been done in the area of institutional strengthening of the Ministry and promotion of competitive markets. In 2001, the government received a second loan of US$10 million from the ADB to implement the agriculture sector development program within which production and marketing support to agricultural producers will

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[6] Livestock head are converted to SEUs using the following factors: sheep 1; goat 0.9; cattle 6; horse 7; and camel 5.

[7] The Land Law and the Land Management Regulations adopted in 1995 provide for a continued State-ownership of land, and for long-term, inheritable, but non-transferable leases to individuals and economic entities. Lease certificates are issued for arable land and dairy farms, but not for pastureland. The Land Fee Payment Law of 1997 sets fees for leasing land from the State, yet livestock herders using common pastureland and haymaking areas are exempt from land fee payments.

be provided including implementation of the Green Revolution Program, improvement of veterinary services, well rehabilitation, cooperative development, rural communication links and credit facilities to agricultural producers.

Ways to Improve the Delivery of Agricultural Support Services

There remains much to be done to improve delivery of agricultural support services, although considerable effort is being made by the Mongolian Government, with or without assistance from international or bilateral organizations in the form of project financing and implementation. Some of these projects aimed to improve agricultural support services. However, these activities are not being coordinated well and therefore are unable to get the most out of external assistance. Therefore, coordination of the foreign assistance needs to be improved at the Ministry level.

The severe winters and dry summers in 1999-2001 show that not only quantity, but also the quality of livestock need to be improved and training on, e.g., herd composition and farm management need to be provided. Furthermore, a system of agribusiness risk reduction is needed to be set up through developing insurance system and the like.

Outbreak of foot-and-mouth disease in 2001 in several places shows that preventive measures from infectious diseases are not being carried out effectively. This is primarily because the government is not providing adequate funds for such measures. The government should provide high priority to disease prevention and allocate the required budget. Efforts are needed to help enterprises remaining in the public sector, such as Biokombinat, a factory that produces vaccines for combating animal diseases, to operate autonomously and compete fairly with the private sector.

The government should also support development of cooperatives and similar entities that provide support services, ensure sustainability of international assisted projects and disseminate their experiences even in areas not covered by the projects.

REFERENCES

Agricultural Extension Center, 2000. *Mongolian Agricultural Extension Network and Its Future*.

Asian Development Bank, 2000. *Agriculture Sector Development Program*.

----------, 2000, "Rural Finance Project, Mongolia", report.

Danagro Advises A/S, 1997. "Study of the Links Between Central and Local Government for the Delivery of Services to Rural Community".

Ministry of Food and Agriculture, 2001. *Food and Agriculture Information*, No. 2.

Ministry of Food and Agriculture and ACDI/VOCA Farmer to Farmer Project, 2001. "Privatization of Veterinary Services in Mongolia", seminar materials.

National Statistical Office of Mongolia, 2000. *Mongolian Statistical Yearbook 1999*.

Appendix I

Agriculture Sector Indicators: Industrial Composition of GDP

Industry	GDP (billion tugrik)					Share of GDP (percent)				
	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
Agriculture, hunting and forestry	209.1	283.0	298.9	306.2	315.4	38.0	43.8	35.9	37.5	36.1
Mining and quarrying	66.0	67.2	119.2	68.3	82.2	12.0	10.4	14.3	8.3	9.4
Manufacturing	66.4	38.4	55.0	47.5	50.4	12.1	5.9	6.6	5.8	5.8
Electricity, heat and water supply	9.7	14.4	25.6	33.2	41.2	1.8	2.2	3.1	4.1	4.7
Construction	9.2	17.8	18.2	20.1	20.2	1.7	2.7	2.2	2.5	2.3
Wholesale, retail, repair of household and personal goods	93.5	107.9	175.0	172.2	179.5	17.0	16.7	21.0	21.1	20.6
Hotels and restaurants	3.8	5.8	8.7	9.6	10.5	0.7	0.9	1.0	1.2	1.2
Transport, storage and communication	35.1	47.9	64.1	72.0	76.1	6.4	7.4	7.7	8.8	8.7
Financial services	6.7	11.5	13.7	12.9	15.1	1.2	1.8	1.7	1.6	1.7
Real estate	3.5	5.1	6.7	8.3	9.8	0.6	0.8	0.8	1.0	1.1
Public administration, defense, and compulsory social security	16.7	18.5	20.9	30.6	33.3	3.0	2.9	2.5	3.7	3.8
Education	20.6	22.2	22.4	27.7	30.6	3.7	3.4	2.7	3.4	3.5
Health and social work	14.5	16.6	16.8	19.8	20.5	2.6	2.6	2.0	2.4	2.4
Other community, social and personal services activities	0.8	1.3	1.6	2.4	2.5	0.2	0.2	0.2	0.3	0.3
FISIM	-5.5	-11.1	-14.0	-13.5	-13.6	-1.0	-1.7	-1.7	-1.7	-1.6
Total	550.1	646.5	832.8	817.3	873.7	100.0	100.0	100.0	100.0	100.0
GDP per capita (000 tugrik)	239.9	277.5	352.3	341.1	359.6					

Appendix II

Number and Composition of Livestock

(Unit: 000 head)

Item	Sheep	Goat	Cattle	Horse	Camel	Total
1989	14,265	4,959	2,693	2,200	558	24,675
	(57.8)	(20.1)	(10.9)	(8.9)	(2.3)	(100.0)
1990	15,083	5,126	2,849	2,262	538	25,858
	(58.3)	(19.8)	(11.0)	(8.8)	(2.1)	(100.0)
1995	13,719	8,521	3,317	2,648	368	28,573
	(48.0)	(29.8)	(11.6)	(9.3)	(1.3)	(100.0)
1996	13,561	9,135	3,476	2,771	358	29,301
	(46.3)	(31.2)	(11.9)	(9.4)	(1.2)	(100.0)
1997	14,166	10,265	3,613	2,893	355	31,292
	(45.3)	(32.8)	(11.6)	(9.2)	(1.1)	(100.0)
1998	14,694	11,062	3,726	3,059	357	32,898
	(44.7)	(33.6)	(11.3)	(9.3)	(1.1)	(100.0)
1999	15,191	11,040	3,825	3,164	356	33,576
	(45.2)	(32.9)	(11.4)	(9.4)	(1.1)	(100.0)
1989-99 percent change	6.5	122.6	42.0	43.8	-36.2	36.1

Note: Figures in parentheses are percent.

11. NEPAL

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INTRODUCTION

Nepal is a small country located in the geographical setting of 26º22' N to 30º27' S latitude and 80º4' E to 88º12' W longitude with 147,181 km^2 physical area and in the lap of the Himalayan mountains. Its average length is 885 km and width is 193 km bordered by China in the north and India in the south, east and west rendering it in the landlocked position. Ecologically the country is divided into three main regions, running east to west these are the Mountains, Hills and the Plains (Terai).

The Mountain region lies in the north of the country having an altitude range of 4,877-8,848 m above the Average Mean Sea Level (AMSL) and covers about 35 percent of the land area of the country of which only about 2 percent land is suitable for cultivation and contains approximately 7.3 percent of the country's population. Almost all the big river systems originate from this region and make the country rich in water resources for multipurpose uses.

The Hill region is located between the Plains and the Mountains having altitude ranges of 610-4,877 m above AMSL and covers an approximate area of 42 percent with 46 percent population. Ten percent of the area is cultivable and characterized by fertile valleys and basins. It is this region of the country, which is naturally gifted with climatically suitable conditions for diversified agricultural production of cash and cereal crops, fruits and vegetables, spices and herbs and plantation crops such as tea and coffee.

The Terai region lies in the southern part of the country and is the extension of the Gangetic plains of India. It occupies 23 percent of the total land area of the country of which 40 percent area is cultivable. It accommodates approximately 47 percent population according to 1991 census data. But the population of this region is increasing at a faster rate compared to the other two regions. Internal migration, resettlement of people from Mountains and Hills in the cleared-up forest land, higher agricultural productivity, greater opportunities for employment, industrial development particularly after the opening of the East-West Highway are some of the reasons for increased population pressure on agricultural land, which is a limited resource of the country.

LAND USE AND LAND DISTRIBUTION

The land use pattern of Nepal is categorically classified as agricultural land cultivated, agricultural land uncultivated, forest land including shrubs, pastures, and others. The distribution of land area is given in Table 1.

Table 1. Land Use Pattern

	Area (000 ha)	Percent
Agricultural land cultivated	2,986	20.2
Agricultural land uncultivated	987	6.7
Forest including shrubs	6,306	42.7
Pasture	1,757	11.9
Others	2,730	18.5
Total	14,766	100.0

The data presented in Table 1 indicates that land used for agricultural production purposes is only about 20.2 percent. of the total area of Nepal. However, a small percent of land area has been converted from forestland into arable land. Now the total area under cultivation has been estimated as 29.4 percent. There is very little scope of any further expansion of land for cultivation. Any attempt to do so will be at the cost of environmental degradation which has at present reached alarming proportion and needs immediate restoration and conservation for maintaining agricultural productivity at its present level.

Landholdings and the landless according to 1991/92 census were 2,704,000 and 32,000 and the area of holdings was estimated as 2,597,000 ha. Average size of holding in 1981/82 was 1.13 ha and reduced to 0.96 ha which will further decrease, as has been reported in various sample data. At present the average landholding size has been estimated to be 0.6 ha. The trend in decreasing landholding size is mainly attributed to the inheritance law, which is causing further fragmentation and scattered land parcels. 1991/92 recorded the average parcel size of 0.24 ha. This type of landholding and scattered fragmentation situation is unsuitable for using modern technology and cultural practices. Moreover, investment in such smallholdings is not economically viable.

POPULATION AND AGRICULTURE

Nepal's population is estimated to be 23.453 million with a population density of 159.3/km^2 and a growth rate of 2.37 percent in the year 2001. Although, there has been a change in the proportion of the population dependent on agriculture yet about 80.6 percent of the population (above 15 years of age group considered to be economically active) is still engaged in agriculture for their livelihood. This type of situation once again cannot be considered desirable for the development of agriculture.

AGRICULTURAL PRODUCTION SITUATION

Nepal was a food surplus country up to the decades of 1970s and 1980s but became deficit at the very beginning of the last decade of the 20th century. Edible cereal production is estimated to be 4,099,000 mt against the requirement of 4,286,000 mt thus leaving a deficit of -186,000 mt. The gross situation of food production and demand during 1989/90 and 1998/99 is depicted in Figure 1. The trend in production and consumption requirement appears to vary but after 1995/96, the gap is showing an increasing deficit situation.

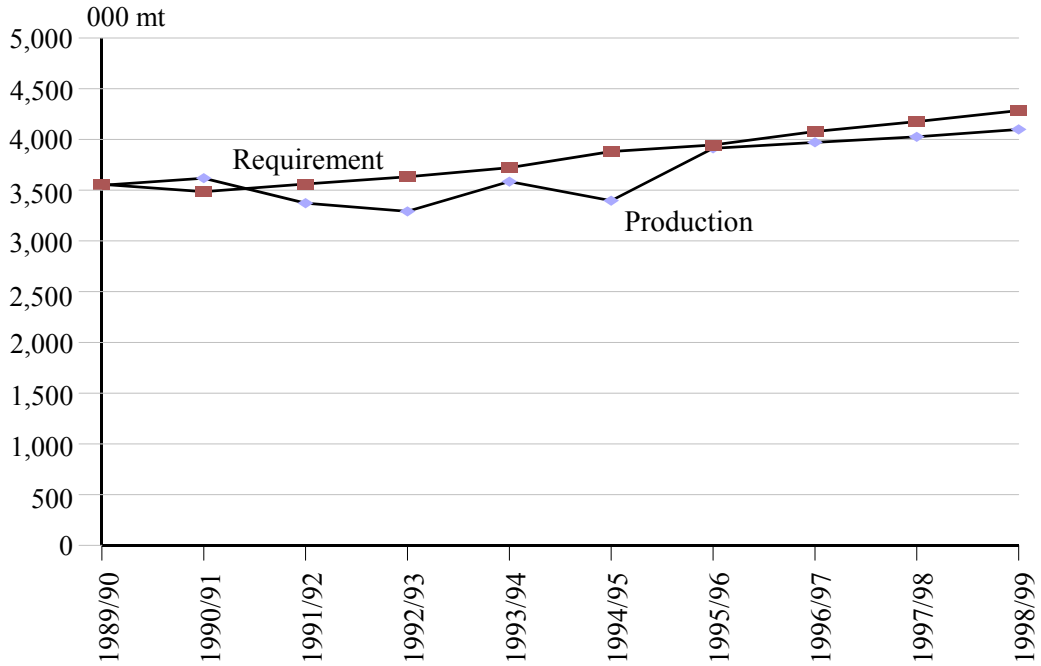

Figure 1. Edible Cereal Production and Demand for Food in Nepal

An analysis of the domestic demand for food grains up to the period 2030 (Paroda, 2000) estimates that Nepal would require 5.7, 7.8 and 10.0 million mt of food grains in the year 2000, 2015, and 2030, respectively. Demand for horticultural products comprising fruits, vegetable, roots and tubers is estimated at 3.5 million mt in the year 2000 and will increase to 7.6 million mt in 2030 with low-income growth rate (3.5 percent) and to 9.0 million mt with high-income growth rate (5.5 percent). In the year 2030, livestock products demand is likely to be 2.9-3.6 million mt for milk and 0.73-0.96 million mt for other livestock and fisheries products.

Production status with respect to area cultivated under major cereals, oil seeds, pulses, and livestock is shown in Tables 2 and 3.

Table 2. Livestock Products in Different Time Periods

Year	Milk (mt)	Meat (mt)	Eggs (000)	Fish (mt)
1988/89	833,891	141,226	288,057	6,977.01
1989/90	858,767	145,381	357,127	7,532.58
1990/91	864,831	147,347	369,519	8,713.39
1991/92	871,234	148,695	368,164	9,125.31
1992/93	876,594	149,893	370,928	8,608.81
1993/94	918,609	154,343	378,079	8,828.46
1994/95	941,373	198,748	383,122	9,542.54
1995/96	961,560	161,520	396,400	10,031.30
1996/97	1,012,163	174,268	421,460	11,726.62
1997/98	1,048,040	180,675	440,910	12,372.98
1998/99	1,072,945	185,034	460,625	12,400.00
1988-92	857,180.8	145,662.3	338,234.3	8,087.07
1993-96	924,534.0	166,126.0	382,132.3	9,252.78
1997-99	1,044,382.7	1,799,992.3	440,998.3	12,166.53

Table 3. Area, Production and Yield of Cereal Crops in Nepal

(Unit: Area = 000 ha; production = 000 mt; and yield = kg/ha)

Year	Paddy			Maize			Millet		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
1984/85	1,376.86	2,709.43	1,967.8	578.72	819.85	1,416.7	134.37	124.43	926.0
1985/86	1,391.04	2,804.49	2,016.1	614.68	873.75	1,421.5	151.05	137.94	913.2
1986/87	1,333.36	2,372.02	1,779.0	626.71	868.35	1,385.6	150.78	137.59	912.5
1987/88	1,423.29	2,981.78	2,095.0	673.81	901.50	1,337.9	164.77	150.13	911.1
1988/89	1,450.47	3,283.21	2,263.5	721.87	1,071.61	1,484.5	182.56	183.09	1,002.9
1989/90	1,432.85	3,389.67	2,365.7	751.17	1,200.99	1,598.8	193.49	224.78	1,161.7
1990/91	1,455.17	3,502.16	2,406.7	757.71	1,230.95	1,624.6	198.57	231.63	1,166.5
1991/92	1,411.81	3,222.54	2,282.6	754.09	1,204.71	1,597.6	198.24	228.66	1,153.5
1992/93	1,262.11	2,584.90	2,048.1	775.22	1,290.50	1,664.7	201.77	236.75	1,173.4
1993/94	1,450.45	3,495.59	2,410.0	754.10	1,253.83	1,662.7	225.21	245.96	1,092.1
1994/95	1,368.42	2,906.18	2,123.7	771.41	1,302.12	1,688.0	228.06	252.84	1,108.7
1995/96	1,496.79	3,578.83	2,391.0	791.70	1,331.06	1,681.3	260.09	282.84	1,087.5
1996/97	1,511.23	3,710.65	2,455.4	793.72	1,316.84	1,659.1	259.94	289.48	1,113.6
1997/98	1,506.34	3,640.86	2,417.0	799.06	1,367.34	1,711.2	262.44	285.12	1,086.4
1998/99	1,514.21	3,709.77	2,450.0	802.29	1,345.91	1,677.6	263.95	291.37	1,103.9

... To be continued

Table 3. Continuation

Year	Wheat			Barley			Oilseeds		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
1984/85	451.89	533.72	1,181.1	27.39	23.46	856.5	127.82	84.03	657.4
1985/86	482.82	598.00	1,238.6	29.32	23.43	799.1	137.92	78.39	568.4
1986/87	535.53	701.04	1,309.1	28.56	24.67	863.8	142.89	82.50	577.4
1987/88	596.75	744.60	1,247.8	29.11	24.29	834.4	151.49	94.37	622.9
1988/89	589.29	830.05	1,408.6	29.45	27.02	917.5	154.86	99.19	640.5
1989/90	604.24	854.96	1,414.9	29.54	27.39	927.2	153.66	98.06	638.2
1990/91	592.74	835.97	1,410.3	29.61	27.84	940.2	156.31	92.14	589.5
1991/92	571.26	761.96	1,333.8	29.66	27.64	931.9	154.57	87.84	568.3
1992/93	613.98	765.00	1,246.0	29.68	27.61	930.2	165.24	93.69	567.0
1993/94	611.31	898.89	1,470.4	37.39	35.16	940.4	177.49	107.54	605.9
1994/95	624.33	941.68	1,508.3	39.10	37.11	949.2	184.46	116.30	630.5
1995/96	653.50	1,012.93	1,550.0	39.40	41.34	1,049.2	185.00	115.99	627.0
1996/97	667.12	1,071.97	1,606.9	35.28	36.69	1,040.0	182.11	119.25	654.8
1997/98	640.03	1,030.32	1,609.8	35.59	37.15	1,043.8	179.22	110.23	615.0
1998/99	640.80	1,086.47	1,695.5	31.84	31.80	998.6	190.43	119.73	628.7

Average annual compound growth rates in area, production and yields of various food commodities (Paroda, 1996) were estimated for rice as 0.0, 1.0, and 1.0; for wheat as 1.2, 3.0, and 1.8; for maize as 0.5, 2.6, and 2.1 percent; respectively. For pulse the growth rates were 2.2, 2.7 and 0.5 percent. Edible oil crop production (oil equivalent), growth rate was 2.0 percent. The growth rates of production of vegetables and fruits were 5.2 and 4.8 percent, respectively.

Poverty Envisioned in the APP

It is estimated that at the end of the Agricultural Perspective Plan (APP) (2014/15), the rural population falling under the poverty line will decline from 49 to 14 percent (Table 4). Agricultural growth rate will increase from 3.0 to 5.0 percent and population growth rate will be reduced from 2.5 to 2.0 percent. This long-term perspective plan is to be achieved through the Five-Year Plans of the National Planning Commission (NPC). This includes improved market infrastructures and accessibility, more employment opportunities for rural people, development of transport and communication infrastructure, all-weather rural roads, more healthcare, education, and family planning as some of the means to reduce poverty and secure required foods availability.

Table 4. Trends in Rural Poverty and APP, 1991/92-2014/15

Year	Incidence (percent)	Number of Poor (million)
1991/92	49	8.9
1994/95	49	9.3
1999/00	40	8.5
2004/05	30	7.0
2009/10	20	5.2
2014/15	14	3.8

When we consider the share of GDP by sectors, agriculture is still the single largest sector contributing 40.1 percent to the total GDP compared to the other non-agriculture sectors. Considering the large population dependent on farming, Nepal still has a predominantly agriculture-based economy which cannot afford to think of other sectoral development. Sectoral contributions to GDP are self-explanatory in Figure 8.

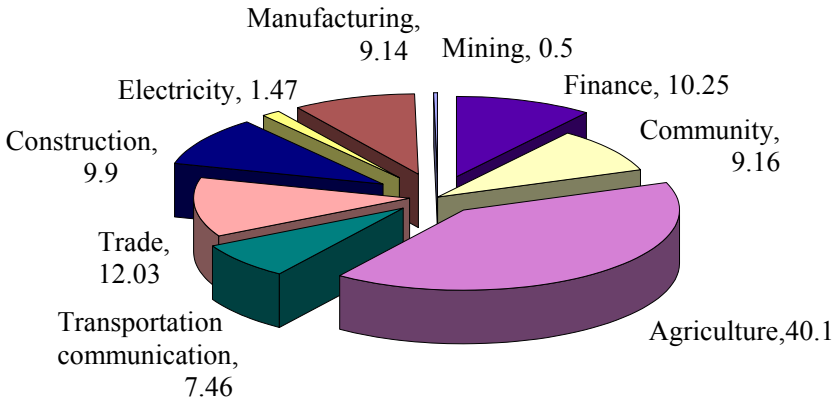

Figure 8. Contribution of Production Sectors to GDP

SMALL FARMERS DEVELOPMENT PROGRAMS IN NEPAL

Introduction and Background

The concept of small farmers has been variously defined for its operational purposes. One such concept grew out of landholding size of a farm family as the criterion for defining a small farmer, i.e., anyone owning/operating a farm less than 1 ha. This concept developed in the decade of 1970s when the poverty situation started deteriorating particularly in the rural areas where a large proportion of the population depended for their livelihood on farming. In Nepal the situation was even worse because it is estimated that about 45-49 percent of the rural population fall below the poverty line. While poverty reduction became the "Attention Getter" the need for special programs was realized and as a result His Majesty's Government of Nepal (HMG/N) initiated the Small Farmers Development Project in 1975 and the Agricultural Development Bank, Nepal (ADBN) was vested with the responsibility to execute this program. After a few years of testing this project in two districts, the project was launched at the national level under the nomenclature the Small Farmer Development Program (SFDP).

The ADBN Definition of Small Farmer

For defining small farmers, the two criteria of per capita income and landholding are used now. Those having less than 0.5 ha of land and per capita income of Rs.2,500 (at 1987/88 price, equivalent to US$40 at present rate) have been categorized as the small farmers. "Small farmer is one who is depending on the profession of agriculture and cottage industries at the village level, whose landholding is small, who is a tenant sharecropper, fisherman, landless laborer engaged in rural industries and other skilled laborers whose annual income does not exceed Rs.2,500 per head" (ADBN/SFDP).

Objective of the SFDP

The overall purpose of the SFDP is to:

* help small farmers by increasing their productivity, production and income and thereby, improving their quality of life by encouraging them to carry out subsidiary activities, which would directly benefit them.
* increase employment opportunities for small farmers by mobilizing their skill, resources and labor.
* enable small farmers to develop their own institutions and formulate village level plans and programs according to their choice and needs and implement them accordingly.
* build up a feeling of social solidarity and trust among group members to raise their voice for different services by different socioeconomic programs viz., health and sanitation, nutrition, education, water supply, family planning, etc.

Two field action programs were implemented by ADBN with an initial support from FAO/ASARRD. This marked the beginning of any institutional support to the small farmers – the rural poor. And what began as an experiment at Sakhuwa and Tupche has developed as a model for the upliftment of thousands of Nepalese small farmers.

After a few years of the experience of the projects, impact studies were carried out on the field action programs by national and international agencies. The evaluation study undertaken by Agriculture Project Service Centre (APROSC) revealed that the small farmers under the ambit of the SFDP were better-off compared to their counterparts who did not join the program. The observation of the International Fund for Agricultural Development (IFAD) supervision mission team was that the "SFDP in Nepal is one of the best models of participatory rural development program in South Asia". As a result the program was accorded high priority and spread all over the Kingdom as a national poverty reduction program.

ADBN being a developmental financial institution has to ensure the financial viability of the program. Therefore, since 1989/90, ADBN has initiated the consolidation of SFDP in which some non-performing and non-viable SPOs were amalgamated in the neighboring performing SPOs or Branch and Sub-branch of ADBN as a unit. New SPOs were established in only such Village Development Committee (VDCs) where they are actually needed.

As for FY 1999/2000, the total beneficiary members have reached 160,827 (female: 37,856 [24 percent]; and male: 122,971 [76 percent] from 300 SPOs of 582 VDCs in 75 districts. The investment of the SFDP has increased to Rs.5.94 billion; collection, Rs.4.14 billion; and outstanding Rs.1.24 billion with a repayment rate of 42 percent.

Basic Policies of SFDP

1. ***Group Organization***

This is the fundamental characteristic of SFDP. The program underscores the fact that an individual small farmer is economically and socially weak and is thus dominated by the better-off. So, this program aims at providing group personality to each individual and helps them to benefit from the development programs by seeking their direct participation in economic as well as social programs. Generally, the groups thus formed comprise 5-10 members (small farmers) who have similar type of problems, interest, economic status and live in the same location.

2. ***Planning from Below***

Various studies have indicated that the "top-down" approach of planning process in Nepal has been unable to take care of the aspiration and felt-needs of the rural poor. These types of development programs mostly suffered from an inactive implementation process, which resulted in ineffective delivery of services and facilities. Realizing this fact "planning from below" is central to SFDP to enable small farmers make their own plan based on their needs, e.g., kind and quantity of inputs, resources and further help to be sought from the government and other line agencies.

Contribution of SFDP to Reducing Rural Poverty

The basic development philosophy of SFDP is to bring its efforts to the grassroots levels through participatory group approach for integrated socioeconomic development of deprived rural communities. As such, the program is not redistributive either in terms of wealth or income. Thus, the program focuses on enhancing the productivity of land and labor resources available to the small farmers. For this, SFDP aims to create self-employment opportunities by providing credit and allied services such as literacy, awareness building, basic health and sanitation. The program also tries to improve productivity by changing technology of production. This involves physical development of productivity enhancing schemes such as irrigation and skill development of the participants.

Implementation Modalities of SFDP

SFDP sites are selected on the basis of a survey. Area survey basically gives the information on the topography, climate, availability of natural resources, farm family structure, income, and composition of the different ethnic groups in that area. It is a benchmark survey of the area prior to project intervention.

The next step is to conduct pre-household survey by the Group Organizer (GO). The survey provides all the information on land area, types of crop and cropped area, production and types of income-raising activity, income and expenditure. These information help the GO to identify the small farmers. Detail household survey is conducted only for those identified small farmers who are interested in joining the groups. The survey gives information on labor use, consumption pattern, existing skill, land use, literacy, health and nutritional status. The information helps to assess the impact after the project intervention.

The GO is an employee of ADBN. She/he is a change agent and represents the interest of small farmers. She/he has working experience on agricultural credit and an insight into the small farmers situation. She/he is also given training, which basically helps her/him work efficiently for the rural poor.

At the grassroots level, the small farmers are organized into groups, which are informal in nature. The small farmers' groups are both homogeneous and heterogeneous. As far as possible, priority is given to form homogeneous groups. All inputs and services required by small farmers are provided through small farmers' groups on group liability basis. Group approach for a meaningful people's participation is used as a tool for the development of rural poor. The groups of small farmers, thus formed, identify, plan, implement and also monitor and evaluate their economic and social development projects and programs.

Operational Methodology

The program follows well defined and specially designed set of implementation procedures, which are discussed below:

1. ***Project Site Selection***

Although, most of the settlements in Nepal are inhabited by poor people, the incidence and depth of poverty varies from village to village. The district level Project Implementation Committee recommends the potential SPO sites on the basis of incidence and depth of poverty in a VDC following the criteria defined for small farmers. Besides, some consideration is also given to the possibilities of exhibiting a demonstration effect to other surrounding VDCs. The SFDP Division makes the final selection by following the recommendation of the SPIC.

2. ***Recruitment and Training of Group Organizers***

Human input is critical and essential for any program. GOs are recruited or selected from among the pool of ADBN staff based on their aptitude to work in the most remote rural settings. After the selection, the GOs are trained in job orientation, process and methods of group organization, programming methodology and coordination and linkage aspects, and also periodical refresher training.

3. ***Identification of Small Farmers***

The poor identified as small farmers include the low-income producers of agriculture, livestock and aquatic products and refer to tenants, sharecroppers, landless agricultural labors and small owner operators meeting the criteria defined by the SFDP.

4. ***Benchmark Survey***

Benchmark is undertaken to assess the status of the households for preparing the village poverty profile to identify the poor families (the target participant), and assess the local needs, locally available resources and kinds of intervention required to achieve the goals.

5. ***Group Formation and Orientation***

Five to 10 small farmers of occupational/ethnic homogeneity are organised into a group. The members themselves select group leader and other supporting positions. They are given orientation training about the SFDP benefits, supports, and joint liability which is specially emphasized so that acceptance of group pressure effects on any defaulter by all the members is achieved. The group members are involved in various activities related to socioeconomic aspects by individual or collectives developed and implemented by themselves along with some programs given by the SFDP for which necessary support services are provided. Group saving is mandatory and credit facility by the ADBN is made easy to avail. These two factors are the key elements of motivation for the group members to participate in the group program activities and for ensuring the effectiveness of the group Training for skill enhancement is an important supporting activity.

Organizational Framework

The organizational structure of the SFDP has undergone several changes from time to time in tune with the requirements. The current organizational structure is shown in Figure 9.

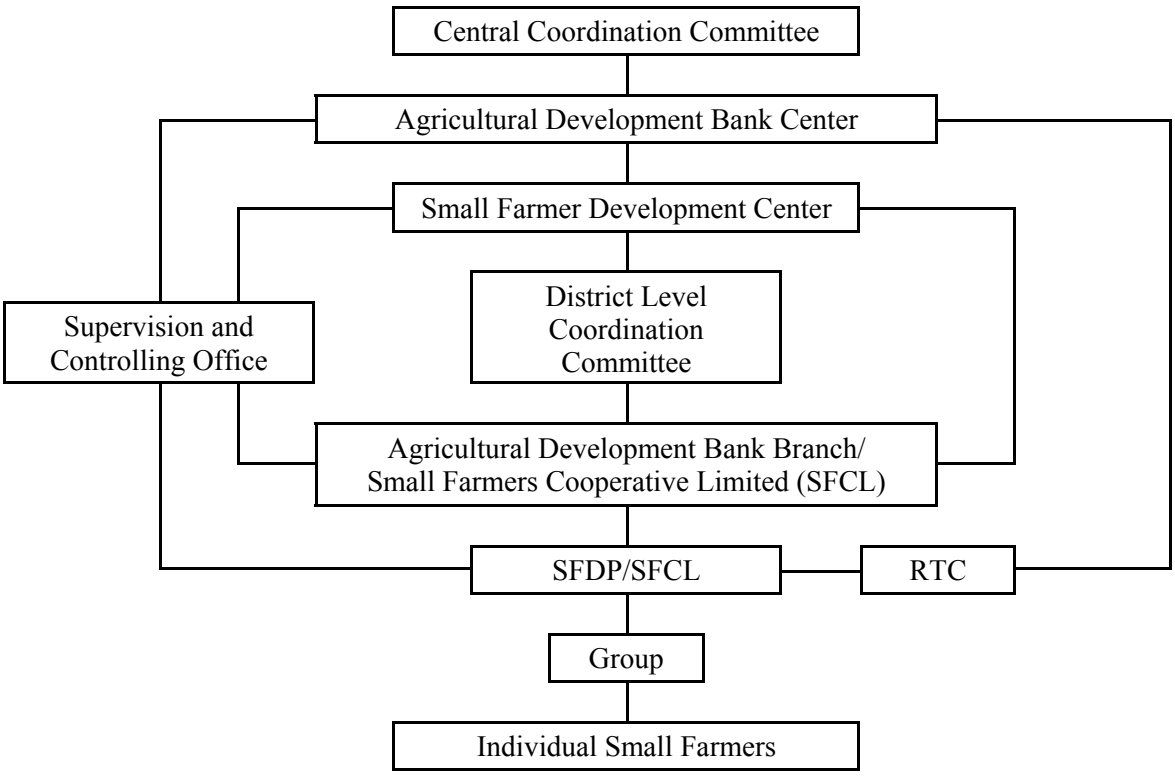

Figure 9. Organizational Structure of the SFDP

Major Activities

1. ***Economic Activities***

SFDP provides credit for improving productivity of the limited size of landholding together with improved production technologies for intensive cultivation practices. Types of credit include production, livestock, poultry, irrigation, farm mechanization, irrigation, and horticulture, etc. Besides, credit is also provided for marketing, agro-processing, and other income/employment generating activities in order to strengthen economic base of the small farmers.

2. ***Marketing Arrangement***

Various types of marketing arrangements have been made. These differ from one SPO area to another depending on the geographical situation. Some examples are illustrated below.

* Marketing loan has been disbursed to small farmers to purchase farm produce from other fellow small farmers and sell it in the market situated in different places.
* Group marketing has been undertaken in which small farmers collect their produce from fellow farmers and sell the same in distant market place turn-wise.
* Milk has been sold through milk collection centers established in potential areas by the Dairy Development Corporation at the request of SFDP/ADBN.
* As a result of these arrangements, small farmers have been able to get reasonable prices, use their spare time in other productive activities and create employment opportunities.

3. ***Creation of Productive Assets***

SFDP has emphasized the construction of small community surface irrigation schemes by providing community organization and technical support services. Other appropriate irrigation technologies introduced are the power pumps, shallow tube-wells and sprinklers.

4. ***Training Programs***

In order to increase the efficiency and productivity of small farmers in terms of production and income by enhancing their knowledge and skills, varied types of training and seminars have been conducted. Crop

production, horticulture, adult education, cottage and small industry, irrigation management, environment, and women development program are the main components of the training imparted to small farmers.

5. ***Livestock Insurance***

Livestock insurance scheme has been implemented in some potential SPOs. The basic feature of the scheme is its management through member farmers' own associations. Training has been imparted to small farmers. Para-veterinary personnel are developed from among the farmers themselves.

The important feature of the scheme is self-insurance by livestock owners. It is entirely voluntary. The insurers themselves decide on the annual premium on the basis of past 5-10 years of mortality rates of livestock in their given area and administer the scheme through an elected insurance committee of their own. As for the premium, it is replenished by 50 percent matching fund by ADBN using HMG/N subsidy.

6. ***Environmental Conservation***

Realizing the adverse effect in agricultural productivity due to soil erosion, environmental conservation programs have been undertaken. Under this program a series of activities such as orientation, promoter training, skill enhancement training, forest nursery and plantation, river training, low cost electrification, etc. were carried out in the project sites. Major purpose behind conducting these activities is to create awareness among the villagers regarding environmental issues. Such program implemented in the rural area is believed to benefit the entire population residing in project sites.

Achievements

* As of FY1990/2000, 4,955 women's groups (40,256 members) and 12,578 men's groups (100,459 members) have been formed as the Agriculture and Fisheries Development Plan (AFDP) participants, covering 75 districts and 601 VDC or communities.
* Of these 2,423 women's groups (16,468 members) and 5,160 men's group (35,532 members) have been transformed into SFCL after meeting the criteria of achieving self-reliance and self-dependence.
* About 29 types of training are conducted by the regional training centers and Agriculture Credit Training Institute (ACTI); 9,342 women farmers and 45,527 male farmers received training. GTZ contributed 82 percent to the training expenditure and ADBN, 18 percent.
* Farmer's income grew by 19.5 percent; off-farm income, by 68 percent; cropped area increased by 28-84 percent; cropping intensity increased from 203 to 278 percent and gross income increased from Rs.19,000 to Rs.43,000.

OTHER AGENCIES INVOLVED IN PROVIDING SUPPORT TO SMALL FARMERS WITH ADBN

International Agencies

International agencies such as GTZ, EC, IFAD and UNICEF are also partly supporting the SFDP of the ADBN.

* GTZ contributes to training and Institutional Development Program (IDP).
* EC provides financial support for social activities training and informational type of program.
* IFAD supports Shallow Tube Wells and Leasehold Forestry Program.

Line Agencies

* Agriculture Input Corporation (AIC, it is like ADBN) provides fertilizers, seeds, tools and chemicals and pesticides on credit guarantee of the ADBN.
* Department of Agriculture (District Agriculture Development Office [DADO]) supports the SFDP members with improved seeds for seed multiplication, and fruit saplings from HMG research stations and farms and training resource persons.
* Department of Livestock Services supports the SFDP by supplying parental stock of cows, buffaloes, pigs, goats, and poultry birds from HMG livestock and hatchery farms and training resource persons.

Local NGOs

An estimated 15,000 NGOs registered in the country work independently for small farmers. Major work done by big NGOs are mostly in the areas of consultancy services and research/studies while local level

NGOs carry out developmental activities and provide services to the communities where they work with small and poor farmers.

Problems and Issues

Problems of the small farmers can be broadly described as follows:

* landholdings generated and capacity to use the services and reinvestment in farming, the technical and biological limits of the land resource productivity;
* socio-culturally generated inheritance law causing fragmentation of land;
* procedural complexity generated by existing rules and polices resulting in high cost of credit, high interest rate of production loan, high price of inputs and uncontrolled marketing and lower price of farm products;
* extremely limited opportunity for off-farm employment to counterbalance the productions deficiency; and
* provision of subsidy on inputs at least irrigation facilities on individual farms or in group, and energy use on farms.

REFERENCES

ADBN/ACTI. *Annual Report 1999/2000*.

ADBN/SFD Center, 1996. *Small Farmer Development Program: Two Decades of Crusade Against Poverty*, Vols. I and II.

Central Bureau of Statistics, 1997. *Statistical Yearbook of Nepal*, Kathmandu.

Ministry of Agriculture, 1998/99. *Statistical Information on Nepalese Agriculture*, Agriculture Statistical Division, Singh Durbar, Kathmandu, Nepal.

National Planning Commission Secretariat, 1995. *Nepal Agriculture Perspective Plan*, Singh Durbar, Kathmandu, Nepal.

Paroda, R. S. and Padam Kumar, 2000. "Food Production and Demand Situation in South Asia", *Agriculture Economics Research Review*, Vol. 13, No. 1, pp. 1-24.

12. PAKISTAN

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INTRODUCTION

Pakistan is an Islamic Republic of 137 million people located in South Asia. It covers an area of 796,090 km^2 (79.6 million ha) of which 3.6 million ha is forest, i.e., 4.5 percent of the total area. Of the total area, 31.2 million ha are available for cultivation, whereas the present area under cultivation stands at 21.9 million ha. The irrigated land is around 17.9 million ha which constitutes 82 percent of the cultivated area. The remaining 4.0 million ha is rainfed (*Barani*). Pakistan is a subtropical, semiarid country characterized by two seasons of summer and winter. It has a monsoon period which brings heavy rains in most parts of the country from July to September. The climate among different regions is in fact highly diverse lying between 23-42º and 36-55º north latitude, and 60-45º and 75-20º east longitude. It is bounded on the north and northwest by Afghanistan, on the east and southeast by the India, in the south by Arabian Sea and on the west by Iran.

THE ECONOMY

The economy of Pakistan conforms with the natural infrastructure that is primarily agrarian. The agricultural economy continues to remain the dominant industry and plays an important role in the economic development of the country as it provides products and major inputs for domestic and foreign markets. However, the country has undergone marked structural changes. The share of agriculture in GDP has declined from 53 percent in 1950 to 25 percent in 2000 and that of manufacturing has gone up from 8 percent to 17 percent during the same period. In 2000, the share of construction and energy to GDP was 3.5 percent and 4.3 percent, respectively. The services sector contributed 49 percent to GDP in the year 2000. Pakistan economy has sustained high rates of economic growth over long periods. Even in the last two decades when there was turmoil in the international economy, it has grown at a rate of around 6 percent annually and GDP growth was recorded at 4.5 percent during 2000. Agriculture, a major component of the commodity sector has grown by 5.5 percent during the year 2000. The manufacturing sector recorded a growth rate of 1.6 percent during the year whereas the services sector grew by 4.5 percent.

Role of Agriculture Sector

Agriculture in Pakistan is likely to continue as a leading sector in its economy owing to its resource endowments. Pakistan's economy is rural-based and will continue to be so despite massive efforts at industrialization. Promotion of agriculture is a prerequisite for the country to maximize the economic value of its natural resources and to achieve prosperity. A vast scope exists for development of this sector by addressing issues relating to strengthening of support services particularly for small farmers. This sector is still the single largest contributor to the GDP of the country, accommodates 44 percent of employed labor force and is the major source of foreign exchange earnings. The Green Revolution of the 1960s through the introduction of High-yielding Varieties (HYVs) of seeds coupled with increased use of chemical fertilizers, pesticides and irrigation water, resulted in significant increase in crop productivity in the subsequent decades.

According to the 1990 Agricultural Census, there are 5.07 million privately-operated agricultural farms in the country having an area of 19.15 million ha. There are another 149 State-managed farms covering an area of 0.10 million ha. The number of farms under 2.02 ha constitute nearly 47 percent (2.40 million) of the

total private farms but area with these farms is only 11 percent (2.15 million ha) of total farm area. On the other hand, farms of 10.12 ha or above in size are only 7 percent (0.35 million) of the total farms but they command 40 percent (7.58 million ha) of the total farm area. The farms of 2.02-10.12 ha in size are 46 percent (2.32 million) and the area under these farms is 49 percent (23.29 million ha) of the total farm area. The average size of farm in the country is 3.8 ha. Despite being the largest sector of the economy and apart from contributing largely to the economy, Pakistan's agriculture is still at the subsistence level. Pakistan is predominantly a small farms country having 93 percent of farm holdings of less than 10.12 ha with 60 percent of the total farm area. Out of total of 5.07 million privately-managed farms in the country, 3.49 million (69 percent) are operated by owner cultivators, 0.63 million (12 percent) by owner-cum-tenant and the remaining 0.95 million (19 percent) by tenants.

The area under possession of these three categories of farms is 12.44 million ha (65 percent), 3.63 million ha (19 percent) and 3.08 million ha (16 percent), respectively.

Overall land use intensity in the country is 87 percent. It varies from 96 percent in the farms of size less than 2.02 ha to 93 percent in farms of size 2.02-10.12 ha and 7 percent in size of 10.12 ha and above. There are two main cropping seasons; *Kharif* from April to October, and *Rabi* from November to May. Due to regional variations in temperature, several factors determine the pattern of crop sowing and harvesting. *Kharif* main crops are cotton, rice and maize, whereas *Rabi* crops are wheat, grain and sugarcane. Wheat is the staple food of the people and occupies a core position in farming policies. Cotton on the other hand is not only an export earning crop but also provides raw material to the local textile industry. Similarly, rice is a highly-valued cash crop that earns substantial foreign exchange for the country. Of the total cropped area of 21.36 million ha in the country, wheat alone occupies 38 percent followed by cotton and fodder with 13 percent each, rice with 11 percent, pulses with 5 percent, maize and Jawar/Bajra with 4 percent each, sugarcane with 3 percent, and oilseeds and orchards with 2 percent each. The remaining 5 percent of the area is reported under other crops. Livestock farming is an integral part of the rural economy regarded more profitable and as a secured investment. Similarly forestry and fishery sub-sectors are equally vital for the agriculture sector. The contribution of livestock to value-added in the agriculture sector is around 8 percent of GDP.

Table 1. Area, Production and Yield of Crops, 1999-2000

Crop	Area (000 ha)	Production	Yield (kg/ha)
Cotton (bales)	2,983	11,240	641
Rice (mt)	2,515	5,156	2,050
Wheat (mt)	8,575	19,272	2,247
Sugarcane	1,010	46,363	49,904

PRESENT SITUATION OF AGRICULTURAL SUPPORT SERVICES

Pakistan is a country of small farms. The extension of support services to small farmers is of vital importance for the successful development of agricultural resources and for the well being of the farmer. This sector has great potential and wide scope of development by strengthening of supports services for small farmers. An essential element in this regard has to be a significant improvement in the spread of modern agricultural technology.

Research and Development

Research is divided between basic research carried out at the respective research organizations and adaptive research which is commonly carried out as field trials on farmer's field. Adaptive research is the final testing ground for new cultivars and techniques. Considerable progress has been made to evolve a respectable network of agricultural education and research institutions. In addition, 16 government agencies, at provincial level, also conduct some research work. Pakistan Agricultural Research Council (PARC) was established in the mid-1970s. PARC coordinates agricultural research in the country. Apart from internal coordination, PARC also develops linkages with other countries, international institutions and aid-providing agencies. Besides, crop-related research, PARC also undertakes research in the field of land and water

management. As a premier research organization at the national level, PARC provides leadership to the federal and provincial research organizations in identifying priorities, developing nationally originated programs and strengthening their research capabilities. The bulk of research at provincial institutions concentrate on plant breeding.

Agricultural Development Bank of Pakistan (ADBP) has also established a model farm measuring an area of 16.2 ha and an agricultural technology Expo Hall at ADBP Farm, Islamabad to disseminate latest agricultural technology through display of modern agricultural machinery.

Agricultural Extension

The agricultural extension system is responsible for the dissemination of information and technology developed by research institutes for the farmers. An agricultural extension service operates in each province under the supervision of provincial governments. The system aims at providing feedback into research planning. Its objective is to address the technological needs of the farmers. Planning in extension at the provincial level involves preparation of summer (*kharif*) and winter (*rabi*) programs and fixing targets. Issues and constraints are identified besides arranging demonstration and extension operation. A modified system of extension program called Training and Visit System (T&VS), has been started in selected districts. This system is however, expensive and continues to rely on the human medium rather than the modern audio-visual aids.

Agricultural Education

Pakistan has four agriculture universities located at Faisalabad, Tando Jam, Peshawar and Rawalpindi. Besides a number of research centers and laboratories, an agricultural college is also in operation at Quetta where higher agricultural education is provided by universities under the administrative control of the provincial government. These universities are required to have their research programs, if any, processed through the Provincial Agricultural Research Coordination Board where they have to compete with the Provincial Directorate of Agriculture Research for resource allocation.

Recognizing the need for producing an educated class of farmers, agriculture has been introduced as an optional subject in the secondary school level education and at intermediate level technicians are trained by agricultural training institutes which conduct a two-year diploma course for field assistants. The curriculum emphasis is primarily on crop production and protection.

ROLE OF PUBLIC SECTOR IN PROVIDING SUPPORT SERVICES

Support services like soil and water conservation, agricultural extension, agricultural adaptive and basic research and training are provided by the Department of Agriculture in all the four provinces. Besides, Directorates of Soil Conservation are responsible for protecting rainfed land against erosion. Agricultural extension and adaptive agricultural research services are under Extension Wing of the Provincial Department of Agriculture. Quite a few research farms have been established to serve the needs of specific areas in different ecological zones. The conventional pattern of extension services in Pakistan is through the field agents in rural areas who frequently visit farmers to offer technical advice and guidance.

AGRICULTURAL INPUTS AND MARKETING

The fertilizer offtake has grown considerably during the past. Out of a total of 5.07 million farms in the country, 2.49 million (49 percent) report use of fertilizers while another 1.44 million farms (28 percent) report use of both fertilizers and manures. The use of insecticides has been reported by 1.28 million farms representing 25 percent of the total farms in the country. The distribution of fertilizers is carried out through Agricultural Development and Supply Corporation and the National Fertilizer Corporation. Seed Corporation is a public sector organization which deals with seeds of crops. Wheat is the major seed purchased by the small farmers. An efficient marketing system is important for increasing agricultural production and ensuring better returns to the producers. It also assures reasonable prices and quality of products to consumers and helps in reduction of losses. Federal Seed Certification and Registration Department is a regulatory organization for controlling and regulating the quality of seed. The procurement and distribution of quality

seed is the responsibility of provincial governments. There are also about 312 companies in the private sector, including multinational companies, undertaking seed production and marketing in the country. To ensure supply of quality seed to farmers and minimizing crop harvesting losses, Ministry of Food, Agriculture and Livestock has arranged seed processing units through financing of ADBP.

Plant protection measures help in increasing per hectare yield by protecting the crop from damage. Public sector provides facilities to the farmers, such as pest controlling advisory services and aerial spray. Private sector is responsible for carrying out plant protection measures including ground sprays.

In the light of government policy of deregulation, supply of farm inputs is mainly in the hands of private concerns. In order to ensure a reasonable return to the growers, and to benefit the farming community specially the small farmers, government fixes support prices for the major and other crops upward almost every year and these prices are generally announced before sowing time. While recommending the support prices, the Agriculture Prices Commission (APCOM) considers a number of parameters, including cost of production, domestic and world demand and supply situation, market prices and international prices. The Pakistan Agricultural Storage and Services Corporation (PASSCO) established in 1973 aims at stabilizing prices of selected commodities by making direct purchases from the growers and releasing stocks in the market when prices become unduly high. The main rainfed crops such as wheat, rapeseed, gram, groundnut, guar seed are produced through public sector agencies. Markets are characterized by wide seasonal variations. In addition transactions of agricultural produce take place in the open market but are often sold through agents. Lack of adequate road network and storage facilities result in price differences. The dissemination of market intelligence is carried out by the Central Bureau of Statistics, Directorate of Agriculture Extension and through the Provincial Marketing Directorates. Trading Corporation of Pakistan (TCP) also procures major crops mainly for export in suitable international markets.

Livestock Services

Services in the four provinces are provided through respective Livestock and Dairy Departments. These have directorates for rainfed areas as well. Field services are provided through veterinary centers, dispensaries and artificial insemination centers and sub-centers in each tehsil of four provinces. Veterinary Research institutes and livestock extension training centers provide services regarding all critical aspects of livestock improvement.

Forestry Services

The forest area of the country is 3.6 million ha (4.5 percent of the total geographical area). Of the total forest area, 1.4 million a are productive forests and the remaining are protected forests. Besides, the Forest Departments control 6.28 million ha of range lands, supporting 109.8 million livestock population. The forest sector contributed about 0.1 percent to the GDP and 0.3 percent to the agriculture sector during 1999-2000. Pakistan is deficit in timber production and a large quantity of wood-based products is imported annually to meet local demand. On the other hand to earn foreign exchange Pakistan also exports forest products like wood-based sports items. The low forest cover in the country is due to skewed distribution of rainfall and prevailing aridity. Nevertheless, substantial potential exists for tree growth on private farm lands. The Provincial Departments of Forestry administer forest activities in the rainfed areas through periodically-revised working plans. The principal center for forest research in the country is at the Pakistan Forestry Research Institute, Peshawar in North West Frontier Province (NWFP). Moreover, research units have been established to carry out research in sericulture and range development. Sericulture is being practiced as a cottage industry in Pakistan. To promote afforestation in the arid zones, Provincial Forest Departments have established nurseries of forest trees and supply nursery plants to the farmers at a subsidized rate. Besides this, private sector is equally active in developing nurseries of different species which are provided to the farmers at market rates.

INSTITUTIONAL CREDIT SITUATION

There are three main sources of formal credit supply in the country, namely; Agricultural Development Bank of Pakistan, Federal Bank for Cooperatives (FBC) and the commercial banks (CBs). Keeping in view the tremendous resources at their command and the large number of branches spread over the country with

large geographical coverage, it was decided in 1972 that CBs should also be required to provide agricultural credit.

ADBP is the largest financial institution in the country, providing agricultural credit and its share in total formal credit is over 60 percent. Of the total agricultural credit disbursement of Rs.39,688 million in 2000, ADBP provided Rs.24,424 million (62 percent), CBs, 9,313 million (23 percent) and FBC, Rs.5,951 million (15 percent). The total credit supplied by all formal sources is estimated at 30 percent of total requirement. The rest is still catered to by non-institutional sources.

In the year 1979, a new credit delivery system named Supervised Agricultural Credit System was introduced by ADBP to reach the small farmers in remote areas of the country. This system was so dynamic that it changed the entire dimension of the agricultural credit disbursement, recoveries and utilization of loans. Now all credit operations are being managed under the umbrella of Supervised Credit System. ADBP's revolutionary village-based banking approach, through its dedicated force of Mobile Credit Officers (MCOs) has helped thousands of farmers to bridge the technological gap successfully. Loaning has become project-oriented instead of security-oriented. Farming skill and community reputation of farmers in financial dealings are considered while disbursing agricultural credit and crucial element of timely delivery of credit is always kept in view. Total strength of 1,459 MCOs including 31 Female Mobile Credit Officers (FMCOs) and 17 Village Assistant Females (VAFs) were in position as on 30 June 2000 providing credit and technical assistance at the doorstep of farmers. Under Supervised Credit System, young agricultural graduates with rural background are recruited, and after intensive training in credit and agricultural technology, are posted in various branches of the bank for field duties. Each MCO is allocated a specific operational area comprising 15-25 villages and is required to visit each village at least twice a month. Thus a close relationship between the borrower and the bank MCOs is established.

ROLE OF NGOs AND PRIVATE SECTOR

The private sector is an active partner in the development of agriculture. The private sector, i.e., the farmers with assistance from credit agencies undertake investments in farm capital including land improvement, farm buildings, agricultural machinery and livestock. Agricultural production is almost entirely a private activity. Mechanization of agriculture has largely been done by the private sector. Installation of tube-wells by farmers has not only augmented the water availability but has also improved yields of crops through assured and controlled supply of water. Supply of inputs like seeds, fertilizers and ground sprays by the private sector has also led to increase in output.

The existence of NGOs is quite old in the country as the concept of voluntarism is rich in the Muslim society. NGOs are numerous in number and their operations are quite diverse. Agriculture sector is also being covered by a number of NGOs. Some of the reputed NGOs are Agha Khan Rural Support Programme (AKRSP) which is in operation in northern areas of the country, whereas National Rural Support Programme (NRSP), Sarhad Rural Support Corporation (SRSC), Sungi Development Foundation, Small Farmers Welfare Organization (SFWO), etc. are in operation in different areas of the country. Such NGOs run programs like small rural enterprises development which leads to a dynamic micro-credit approach. It acknowledges the utility of increasing access to capital for viable investments in agriculture sector. Similarly rural resource management is carried out by mobilizing local communities. Soil conservation, better farming practices, training to small farmers and promotions of sub-sectors like livestock, forestry, etc. is on the agenda of these NGOs with relevance to agriculture sector. The core of all such activities is mobilization of the local community by forming Village Organizations (VOs) and Community Organizations (COs). Most of these NGOs' performing operations in the agriculture sector, follow the role model of AKRSP, as the organization is a pioneer in such activities.

AKRSP is a private, non-profit organization established in 1982 with a mandate to focus on income generation in collaboration with government departments and other national and international institutions. AKRSP acts as a catalyst for rural development. This NGO is operating in three districts of northern areas of Pakistan. The key feature of AKRSP's approach is the insistence that small farmers organize themselves into broad-based, multipurpose VOs to overcome the handicaps of their subsistence holdings. The VOs must meet regularly as a village assembly for decision-making and monitoring purpose.

MAJOR ISSUES/PROBLEMS AFFECTING THE DELIVERY OF AGRICULTURAL SUPPORT SERVICES

Agriculture has been suffering from various problems such as traditional methods of farming, low yields, shortage of inputs like credit, fertilizers, improved seeds, adulterated pesticides, unstable markets and little attention to the sub-sectors other than crop farming. Major issues and problems specific to each component of the support services system are narrated below:

* In the past, research and extension efforts have been concentrated largely on three crops, namely; rice, wheat and cotton, and have been successful in increasing yields and therefore, the total outputs of these crops. However, other crops such as oilseeds, sugarcane, pulses and maize and sub-sectors such as livestock and forestry have remained either totally neglected or received inadequate emphasis resulting in stagnant yields and low productivity. In some of these areas an effective research base does not exist.
* There are funding constraints in agricultural research and outreach programs and for the upkeep of the research establishments. Funds allocated are inadequate and result in inefficient operation of research programs.
* There is lack of formal monitoring mechanism of the agricultural production system in the country for identifying the emerging problem areas and providing this information in a systematic manner for purposes of research planning. The limited number of well trained and experienced research workers is the principal constraint in improving research capabilities in nearly all institutes in the country. There is lack of coordination among the research institutes. Moreover, lack of information to support research and development activities further retards efficiency. The existing organization of extension services is more or less a continuation of the traditional system and does not address adequately the present day requirements of more progressive, intensive and integrated agriculture. The weakness lies in its horizontal and vertical linkages and operational mechanism including the methodology used for transfer of technology. The process of information dissemination to the farmers still relies heavily on the traditional means of communication, which are known to be slow and inefficient. The coverage of all farmers scattered throughout the country would be difficult with the limited number of extension staff. Moreover, extension agents often lack proper training, which is necessary for dissemination of information and transfer of technology.
* Adaptive research has been limited to simple trials on different crops whereas there is need to conduct such research at the local level for effective transfer of technology. The participation of the farmers and rural youth in the agricultural extension process is negligible at present. Their formal association with the process can be a great help in identifying the field problems. The usual approaches to technology design and transfer have more or less bypassed the rural women. Whereas, there are a number of agricultural operations in the field which are partly or wholly performed by women. Their training in relevant skills and adequate servicing through the extension process is, therefore vital for agricultural development. The present system of training has resulted in loading the students with a great deal of theoretical information but by and large has failed to develop in them practical skills, initiative and communication.
* The small farmers and the landless do not have adequate resources to finance their production and consumption needs. They require adequate credit for resolving problems and increasing income levels. Most of the credit required by small farmers comes from non-institutional sources. The institutional credit is not always demand-oriented like most other inputs and services. It is constrained or rationed by supply. Small farmers are generally unable to use the facility of subsidized loans and a substantial portion of such loans is often availed by influential farmers. Moreover, cumbersome procedures also restrict small farmers' access to formal credit.

  There is generally a lack of proper physical marketing facilities in the country. Inadequacy of efficient wholesale markets, warehouses and cold storage space, transport arrangements and processing facilities characterize the marketing scenario. There is no efficient system of grading and standardization of produce, especially for export. Small marketable surpluses of the scattered small farmers together with their weak financial position makes it difficult to withhold the produce for higher

prices, while the remoteness from organized markets generally influence farmers' decision to sell locally. Lack of a road network from farm to markets is another constraint which restricts mobility of produce to suitable markets.

Measures to Address the Issues

In the country quite a few research institutions or centers have been established, strengthened and upgraded to expand research work. Multidisciplinary research institutes have been established at different locations. Apart form major crops, other crops have also been included in the research program. Moreover, rainfed agriculture is also being supported by specialized research institutes. High priority is given to strengthen the capacity of the provincial governments for applied agricultural research. Besides, efforts are underway to remove resource constraints faced by the research institutes by enhancing budgetary allocations.

For extension purpose, agricultural programs are broadcast on radio and growing use of TV is also being made for this purpose. National press also brings out special supplements on agricultural subjects. Periodic review and monitoring of the operations of extension services is carried out to identify weaknesses of the system for future improvement.

Sub-sectors of livestock, poultry, fishery and forestry have been given growing importance and extension system has been strengthened and improved to support the agriculture sector through improvement in these sub-sectors.

Training facilities have been expanded and improved for the extension staff so that better dissemination of information and transfer of technology can take place, condition of roads from farm to markets have been improved in some areas besides construction of new roads to link remote places with the towns and cities.

In order to provide credit to small farmers, ADBP has consistently increased its disbursement target and now major portion of its annual loans goes to small farmers. The government's system of support prices and procurement of produce is basically meant for small farmers which ensures better return to them.

How to Improve the Delivery of Agricultural Services

In order to shift Pakistan's agriculture from subsistence to self-sustaining viable commercial sector significant work has to be done by both the public as well as private sector through strategies especially tailored for small farmers. There is considerable scope for increasing overall productivity of the sector by extending the use of modern technologies through improvement in delivery of agricultural support services to farmers. This is especially for small farmers who have lagged behind due to their lack of means and limited access to credit needed for the adoption of new technologies. Research activities of all the institutes must effectively be linked together through coordination mechanism. Research should be initiated to improve the design efficiencies of tube-wells. Private sector should be mobilized for groundwater development, watercourse improvement and conservation of water to tackle consequences of drought. The most important shift needed in the provision of inputs is to encourage the private sector to provide the total package including advisory services and not just the sale of a specific input. It is also essential that government intervention of the agriculture sector must be reduced to encourage new investors.

For improving extension services use of electronic media must be adopted on a large scale. Moreover, privatization of extension services could be another solution to improve the system. Quality of agricultural education especially higher education at college and university level should be changed by improving curriculum structure. Cooperative movement may be revitalized for improving marketing system, attaining economies of scale and for enhancing access of small farmers to different institutions. Commercial centers may be established at union council level where small farmers can purchase all sorts of inputs at reasonable rates. Credit may be provided to small farmers on easy terms and conditions by relaxing security requirements. Group loaning may be encouraged by the institutions while dealing with small farmers.

13. PHILIPPINES

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INTRODUCTION

The Philippines is an archipelago of 7,100 islands, with a land area of 301,000 km^2 and a population of around 76.5 million. It is comprised of 16 regions including the National Capital Region (NCR), 78 provinces, 82 cities and 1,526 municipalities.

Agriculture and fisheries play a vital role in the nation's economy. They contribute 19.1 percent to the country's GNP, provide livelihood to 40.1 percent or almost half of the Filipino workforce and generate 5.0 percent of the total exports. Majority, or two-thirds of the population lives in the rural areas, depending directly or indirectly upon agriculture. As a result, about 67 percent of the land area is under intensive cultivation.

Rice is the main staple of 80 percent of the population and occupies more land than any other crop. Corn is the second major crop raised by farmers. Coconut, sugar, abaca and tobacco are the country's traditional export crops with cereal, cereal preparation and textile fibers as two of the major import commodities of the country.

PERFORMANCE OF PHILIPPINE AGRICULTURE

Philippine agriculture achieved major productivity gains from the late 1960s until 1972. Dubbed as the Green Revolution Era, public expenditure in sectors like irrigation, postharvest facilities and agricultural institutions (research and extension) increased fivefold. The increase was primarily due to high world commodity prices and investment in irrigation and fertilizers.

However, the country's agricultural production and productivity stagnated during the 1980s. Likewise, population growth rate was at a high of 2.3 percent per annum. There was pressure to put in place agricultural resource-based productivity growth, to ensure food security for the country as well as sustainability of its economic growth.

To promote growth and increase efficiency, macroeconomic policy reforms were initiated, i.e., opening up of the domestic economy through abolition of quantitative import controls, lower average tariff, liberalization of foreign investment regulations, abolition of price control on food and other essential consumer goods, control of interest rates and devaluation of the peso. With these reforms, the gap between manufacturing and agriculture narrowed and macroeconomic stability was restored.

Annual production growth rate of rice averaged only 1.9 percent during the decade of the 1980s and up until the early 1990s. The reason for the low growth was decline in paddy production by 27 percent and the destructions caused by strong typhoons that visited the country. During the same period, consumption rate was increasing by 3 percent as the population growth was soaring. Hence, government resorted to rice importation. From 1990 to 1999, about 500,000 mt were purchased from neighboring Asian countries like Thailand and India. In 2000, Philippine agriculture picked up and proved to be a lynchpin of the economy as production grew by 6.4 percent. This was mainly on account of support services provided by the government to the sector through the following interventions:

Commodity Programs

One of the major objectives of the agriculture and fisheries modernization program of the Department of Agriculture (DA) is to achieve sustained self-sufficiency in rice by 2003 and fish by 2004. It calls for

rationalization of support for the high growth of livestock industry, intensification of high-value crops production to competitive standards, and implementations of special programs to revitalize the abaca and coconut sub-sectors to regain competitive advantage and status in world agricultural trade. Rice production, which recorded a volume of 12.4 million mt during the year 2000, was achieved through, among others:

(1) dispersal of high quality seed (high breed), and procurement and distribution of certified seed. A total of 528,660 bags were distributed to farmers with an estimated yield of 2,035,341 mt.
(2) construction/rehabilitation of national and communal irrigation systems and the implementation of small-scale irrigation projects such as water impounding projects, diversion dams and shallow tube-wells (STW). Through the National Irrigation Administration (NIA), the program generated 11,086 ha of new areas and rehabilitated about 68,083 ha.

Corn, likewise, recorded good production during the year with a total output of 1,019,288 mt of yellow and white varieties. Under the Corn Program of the DA, a total of 3,324 bags of open-pollinated variety seed were distributed in white corn growing areas. Other components of the Program are: (1) distribution of trichocards to control corn borer in the corn cluster areas; (2) provision of trainings on Integrated Pest Management (IPM), conduct of farmers' field school, and setting up of corn demonstration farms; (3) developing and promoting market linkages among corn producers, consumers and end-users, and providing corn farmers easier access to postharvest facilities and market infrastructure.

Irrigation Development Program

The program aims to establish and rehabilitate irrigation systems to support the national production program and provide adequate level of irrigation service on a sustainable basis. Also, the program provides technical assistance to institutions engaged in the development of water resources for irrigation and support. For the year 2000, it was able to rehabilitate or improve existing irrigation facilities servicing 79,947 ha, while 19,116 ha were generated under new irrigation facilities. Irrigators' associations were also strengthened to enable them to be self-reliant service cooperatives and effective partners in the management of irrigation system.

Postharvest Development Program

The estimated postharvest losses in rice are 6.5-14 percent of annual production. This is more or less equivalent to the country's average annual import of rice during the decade. Likewise, postharvest losses in corn and other crops are also quite sizeable. Hence, the DA seeks to develop, promote and establish appropriate postharvest technologies and facilities in key areas of the country and to work for the adoption of these by providing the necessary support systems.

For the year 2000, under the program recirculating mechanical dryers (MDs), mechanical corn shellers and mechanized corn harvesters were distributed. Also, Multipurpose Drying Pavements (MPDP), village level processing facilities, municipal fishports, ice plant and cold storages, trading centers and livestock auction markets, were constructed/established, improved and maintained.

Research and Development (R&D)

Use of advanced science and technological improvements to carry on the problems of the sector is an important springboard of growth in agricultural production. Public investments in R&D from 1989 to 1997 declined from 0.34 percent to 0.27 percent of Gross Value-added (GVA) in agriculture. Thus, the DA targeted to strengthen its R&D by ensuring the operationalization of the "one system, one program" strategy. This strategy aims to achieve unity of purpose, better allocation of scarce resources and enhancement of efficiency in R&D implementation. Discipline and community-based national R&D networks were supported in 2000. Each network is responsible for coordinating the researchers' link to an integrated Research, Development and Extension (RDE) program for the various commodity/discipline areas and priorities. These networks facilitate and fast track the consultation process among RDE implementing agencies. The DA currently operates and maintains 15 regional RDE networks for agriculture and 13 regional RDE networks for fisheries.

Human Resource Development, Training and Local Government Unit Capability Building

The program aims to increase the capability of the Local Government Unit (LGU) agriculture and fishery extension workers who provide direct extension services to the farmers and fishermen. The ultimate objective is to improve the quality of farm and fishery products and increase the productivity and income of farmers and fishermen.

Agribusiness and Marketing Assistance Program

The program is geared towards enhancement of global competitiveness of the country's agriculture and fishery sectors through intensified market and investment promotion, market intelligence, institutional and enterprise development and strengthening, and facilitation of information service delivery. Working on the "market-driven, private sector-led, and government-supported" policy, the Department provides support to identified commodities that have the greatest potential to realize and the biggest impact on the economy.

In 2000, the DA participated and organized international and local trade fairs, conducted market matching activities, road shows and investment missions, prepared commodity situations on mango, banana, chicken, etc., and evaluated regional agribusiness profiles.

CONSTRAINTS TO PHILIPPINE AGRICULTURE

Some of the problems confronting the sector are:

1. relatively low productivity and lack of competitiveness in the world market. Crops contributed to the dismal performance in terms of average growth. Low productivity is the result of inadequate irrigation, low and or unbalanced fertilizer usage, low adoption of high-yielding rice varieties, senile tree/stocks like in rice, coconut.
2. high cost of delivery and high postharvest losses. Postharvest losses are estimated to range from a minimum of 10 percent to a maximum of 30 percent. They are caused by inadequate or lack of postharvest facilities, poor road networks, inadequate post-handling and shipping services, inadequate cold-chains.
3. intense application of land on a few crops. Corn, rice and coconuts partake about three-fourths of all croplands. Only a few diversify to high-value crops.
4. provision of support services lagged behind the demands of the sector, despite its contribution in increasing productivity. It was reported that irrigated farmland increased marginally from 1.2 million ha in 1993 to 1.4 million ha in May 1998., only about 45 percent of the potential irrigable area.

   Lack of availability of affordable credit facilities/modalities is another constraint to growth in the sector. This is due to poor repayment performance, high transaction costs as well as the perceived riskness of the sector. Loan-seekers often have no collateral to mortgage. The non-bankability of farmers and fisherfolk inhibits banks to lend to them. Other stakeholders like indigenous people and highly upland dwellers also have very limited access to credit.

   Ineffective marketing information system has greatly impeded/affected the flow of vital information to agricultural consumers. High marketing cost is a result of lack or inefficient/poor road system and multiple layers in the marketing system. Areas with poor road conditions are usually not serviced by public transportation. Only the well-off have access to financing, like traders who can buy transportation facilities, thus enabling them to monopolize the trading activities.
5. lack of a well-trained workforce in various segments of the agricultural production and agribusiness chain. This is due to inadequate R&D and poor linkage between centralized R&D and decentralized R&D.
6. reducing agricultural lands and farm lands. Expanding urban and industrial establishments are encroaching upon the irrigated farmlands. Likewise, soaring population growth in rural areas consequently reduces the average farm size.

PLANS AND PROGRAMS

Based on the key result areas of the Medium-term Philippine Development Plan, there are five key areas that agriculture is required to meet, namely:

1. rapid growth of agricultural production through aggressive application of modern science and effective delivery of support services including rural finance, and rural infrastructure;
2. diversification of production and resource use;
3. access to land and other productive resources;
4. environmental sustainability; and
5. institutional structure reform.

It is through these key result areas on which the future performance of the sector shall depend. Hence, in line with the approved Republic Act 8435 or the Agriculture and Fisheries Modernization Act (AFMA), the DA shall continue to intensify its programs that will empower the farmers and fisherfolk to be globally competitive. The banner program of the present administration, which is dubbed as *Ginintuang Masaganang Ani* (GMA or Bountiful Harvest), took off from the *Agriculturang MakaMASA* Program with a vision of a modernized and productive agriculture and fisheries sectors, being able to provide food at prices affordable to all. The GMA shall implement the uncompleted but feasible projects/components. Likewise, GMA is corresponding to the full implementation of the AFMA.

The GMA has four banner programs: i) grains which covers both rice and corn; ii) high value crops; iii) livestock; and iv) fisheries.

The program aims to:

1. increase productivity through promotion of cost-effective production technologies including farm mechanization;
2. increase income for producers and other entrepreneurs;
3. empowerment of small farmers/fisherfolk;
4. fulfill food security requirements by enhancing the ability to produce or procure food and other high value crops; and
5. reduce postharvest losses through improvement of rural infrastructure and cold chain distribution system.

To attain these objectives, the program provides the following components:

GMA – Grains

1. ***Rice Program***

A. *Production Support Services*

This includes the provision of Certified Seeds (CS) of the top four preferred varieties under the 50:50 scheme. The CS shall be made available to masterlisted farmers both from irrigated and rainfed areas. Aside from CS, the DA is promoting cultivation of hybrid rice seeds and the seed is available to interested farmers under the 50:50 scheme.

B. *Training and Extension*

To ensure the achievement of the target yield of 4.0 mt/ha, the DA through the Agricultural Training Institute (ATI), the training arm of the DA trains farmers and LGUs personnel using season-long IPM approach. The farmers are trained on the proper technology from seed-to-seed. The farm serves as the classroom. The participants are taught to identify insect, pests and other adversaries that affect yield of the crop. But, training and extension implementation is not limited to ATI. Other agencies like Philippine Rice Research Institute (PhilRice) and the Bureau of Postharvest, Research and Extension also handle training for specialized courses such as postharvest technologies. Rice specialist provide emphasis on hybrid rice production technology. The participants are farmers, LGUs and other regional field unit staff.

C. *Irrigation*

One important component is the establishment of Small Water Impounding Projects (SWIPs) and STWs, to support the existing national irrigation systems being managed by the NIA. Twenty-two percent of the total budget of the Rice Program is allocation to irrigation.

D. *Infrastructure (postharvest/machinery/farm-to-market road)*

This is the component that would mechanize farm operations, reduce postharvest losses, and provide access to market. Some of these activities include the establishment of MPDP, MDs, threshers, hand tractors, and farm-to-market roads. This component accounts for 13 percent of the total budget of the Rice Program. Under this program, priority is given to farmers who are members of the cooperatives for an interest-free loan, repayable in five years or equivalent to 10 cropping seasons on a farmers-choice scheme.

E. *Research and Development*

This ensures the sustainability of appropriate location-specific production technologies and will enhance Philippine agriculture's global competitiveness. The target is to develop location-specific, environment-friendly, and cost-effective technologies packages and demonstrations.

F. *Communication and Advocacy*

This is the component which empowers people to shape their future through wider participation in government decision-making and implementation. As a strategy, information and educational campaign materials are being developed using appropriate and cost-effective communication media to educate all stakeholders. Regular consultation/briefings will be conducted with the small farmers, collaborating agencies/NGOs and other partners of DA, bureaus and attached agencies.

G. *Marketing Support Services*

This component provides timely, accurate and responsive business information linking farmers with suitable markets. At present, the National Food Authority (NFA) buys only 15 percent of the total farmers' produce. To assist the farmers market their products, market-matching activities between and among farmers, traders, buyers and other investors are being intensified.

2. ***Corn Program***

The program target is to produce a total output of 2 million mt from 500 clusters of 400 ha each.

To attain the target, the program is being supported by the following components:

* Provision of hybrid corn seeds to cluster areas through the Guarantee Program of the Quedan Rural and Credit Guarantee Corporation (QUEDANCOR). Assistance is extended to seed producers such as hybrid companies, input suppliers and end-users.
* Production of trichogramma as a biological control agent for corn borers.
* Farm mechanization includes the provision of larger capacity tractors and other postharvest facilities like recirculating mechanical dryers on a 50:50 cost sharing or co-sharing arrangement with either LGUs or the cluster itself which is a cooperative.
* R&D could either be:
    1) Institutional Corn research Development Program – This is being handled by the Bureau of Agricultural Research (BAR). BAR evaluates and provides research funding related to soil management, cost-reducing production technologies and postharvest.
    2) Farmers' Participatory Technology Development Program – This is being administered by the Bureau of Plant Industry (BPI) for farmers to manage field research related to the development of specific technology and to address specific field problems.
* Training and extension: Just as in the case of rice, this involves implementing season-long training courses both for the technicians and farmers.
* Marketing development and infrastructure support: This includes facilitating marketing tie-ups, contract growing arrangements and joint-venture agreements in the farm clusters including the conduct of trade and farm machinery fairs. For the current year (2001) COAST (Corn-based Agribusiness Systems Technology) is being pilot-tested with the objective of generating private sector investment in corn through joint-venture arrangements with farmer-cooperatives.

GMA – High Value Commercial Crops (HVCC)

Like the Rice and Corn Programs, HVCC aims to empower the private sector, particularly the small farmers or smallholders and entrepreneurs, to expand investments in HVCCs, thereby increasing their contribution to economic growth, farmers' income, and consumer welfare. Under this program, the level of preparedness and interest of the clients are the major consideration in the provision of assistance. The key factor is the willingness of the clients to share in costs of development promotion. Activities could be in kind

such as time, facility and transportation. The clients should have concrete financial and moral stake as well as commitment in the activity to ensure higher success in adoption of recommended packages of technology and innovative business practices that will ensure profitability, ecological balance and sustainability.

GMA – Livestock

The livestock sector aims to:

* narrow the gap between per capita nutritional requirement and actual per capita consumption with respect to food commodities of animal origin;
* make available, accessible and affordable livestock products through increase in overall production and improvement in livestock production coefficients;
* transform local livestock activity from a resource-based to technology-based industry; and
* enhance competitiveness of local livestock and poultry industries in both domestic and foreign markets.

The livestock program has six components to attain its objectives. These are:

1. ***Livestock Enterprise Development***

Cluster livestock production modules will be encouraged and supported. Access to credit for the purchase of livestock will be facilitated. Finally, cooperatives and NGOs involved in livestock enterprises will be strengthened through various capability-building interventions.

2. ***Technology Transfer and Capability-Building***

This will strengthen the promotion and dessimination of appropriate production and post-production technologies. It will focus on farmers and technicians training and the use of selected stockfarms and R&D and training centers as demonstration. Likewise, this component will implement interventions to enhance the capability of personnel of LGUs to be more relevant to the development of the livestock sub-sector in particular areas.

3. ***Genetic Improvement***

This will involve the establishment of nucleus and multiplier farms that are expected to produce genetically-superior animals and genetic materials. It will also involve the intensification of artificial and natural breeding programs, using genetically improved germplasm and sires. Measures shall be employed to conserve livestock genetic pool.

4. ***Animal Health***

This will intensify efforts to prevent, control, and eradicate the foot-and-mouth disease (FMD), through a substantial vaccination program. This will also implement measures to control other major diseases. Finally, the program involves strengthening of diagnostic and other biological laboratories.

5. ***Post-production and Marketing***

This incorporates establishment, upgrading and improvement of abattoirs and livestock markets, as well as quality control laboratories. A standardized market system and the use of sanitary institutionalized abattoirs will be established to ensure the safety and quality of meat products.

GMA – Fisheries

The program aims to be 100 percent self-sufficient in fish by the year 2004, while ensuring the rational and sustainable development, management, and conservation of aquatic and fishery resources in the Philippine waters. Likewise, it also aims to reduce poverty in the coastal areas and enhance people empowerment in the fisheries sector.

To attain its objectives, the program organizes specific interventions, namely:

1) Fisheries production;
2) Conservation and management;
3) Fisheries training and extension services;
4) Information and marketing support;

5) R&D;
6) Fisheries postharvest facilities and infrastructure;
7) Rural financing in fisheries; and
8) Organizational management.

CONCLUSION

In order to attain the vision of the DA of modernizing agriculture and to attain self-sufficiency, strategic intervention shall be formulated and implemented at the least cost.

* Scarce resources shall be focused on priority commodites and regions in order that economically significant commodities from the most productive regions shall be given priority and the highest level of support.
* DA to focus its efforts to ensure full participation of all the stakeholders (fisheries, farmers, private sectors and civil societies) in planning and implemention of the programs.
* Finally, the DA recognizes the important role of the LGUs in the development of rural areas. The LGUs are partners of the DA in carrying out its program down to the field level, since they have the manpower.

REFERENCES

Department of Agriculture. *Annual Report 2000*.

----------, 2001. "The Philippine Agriculture and Fisheries Modernization Plan 2001-2004", February 2001.

----------. "National Integrated Research and Development Agenda for Grains Postharvest", Bureau of Postharvest Research and Extension (BPRE).

----------. "Strategy for National Agricultural Development: Horizon 2010: The Phillippines", World Food Summit Follow-up.

National Economic and Development Authority. "Medium Term Development Plan of the Department of Agriculture".

National Statistics Office. "Declaring as Official the 2000 Population Count of the Philippines by Province, City, Municipality and Barangay as Obtained from the 2000 Census of Population and Housing", Proclamation No. 28, by the President of the Philippines, Malacanan, Manila.

14. SRI LANKA

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INTRODUCTION

The Democratic Socialist Republic of Sri Lanka comprises the main island and several small offshore islands on its continental shelf. Sri Lanka is situated close to the southeastern tip of the Indian Peninsula, between latitudes 5.55º and 9.51º north and longitudes 79.41º and 81.53º east. It is separated from the southeastern coast of India by the Palk Straight, which is a mere 40 km wide. The island's maximum length is about 435 km and its maximum width is about 225 km. The total land area is 65,610 km^2 or about 6.57 million ha. The southern central region of the country is mountainous, with an elevation ranging from 300 m to 2,524 m (Pidurutalagala summit). All the major rivers begin from this part and radiate towards the coast. The central hill region is surrounded by a flat plain, which covers 80 percent of the total land area. The lowland plains cover the entire northern half of the country, whilst the eastern, southern and western areas, are reduced to a relatively narrow strip between the highlands and the coast.

The climate is tropical. The temperature ranges between 24.0ºC minimum and 31.6ºC maximum in the low country and 16.8ºC minimum and 25.0ºC maximum in the hill country. Sri Lanka experiences two monsoon rains each year. Most of the rainfall is received through the southwest monsoon, which occurs between mid-May and September while the northeast monsoon occurs between December and February. Sri Lanka is divided into three major climatic zones based on the annual rainfall, namely; the Wet Zone, the Intermediate Zone and the Dry Zone. The Wet Zone receives an average rainfall of 2,500-5,500 mm. The Intermediate Zone lies at the boundaries of the Wet Zone and the Dry Zone and receives a rainfall of 1,900-2,500 mm. The Dry Zone, which covers the largest land area of the island, receives a rainfall of less than 1,900 mm. The Wet Zone receives most of its rainfall through the southwest monsoon, whilst the Dry Zone receives rainfall from the northeast monsoon. During the two inter-monsoon periods convectional rains occur. Climatic conditions in the Intermediate Zone are generally similar to those in the Dry Zone.

Out of the country's total land area of 6.57 million ha, 5.5 million ha tend to be arable with a large portion of this lying within the Dry Zone. According to the predictions of the Central Environmental Authority (1988) in order to reduce population pressure, improve agricultural production and generate employment opportunities, at least 750,000 families or 3.75 million people needed to be accommodated in the Dry Zone by the year 2000.

The last population census was conducted in 1981 and a population of 14.8 million with a density of 230 persons per km^2 was recorded. These figures had risen to an estimated 18.11 million and 289 persons, respectively in 1995. Population density varies from 41 persons per km^2 in the Mullaitivu District to 3,099 persons per km^2 in the Colombo District. The rate of population increase in 1992 was 1.45 percent. Life expectancy in Sri Lanka is quite similar to that of the developed world, at 69.5 years for males and 74.2 years for females. The literacy ratio for males and females is 91.1 percent and 83.2 percent, respectively averaging 87.2 percent. In 1990 the total labor force (age 15-54 years) amounted to 9.4 million, out of which 5 million were employed, and of these 47.8 percent were employed in agriculture, hunting, forestry and fishing.

Agricultural production in Sri Lanka has dual characteristics with both subsistence agriculture and plantation agriculture. Since the 1920s, due to the establishment of land settlement schemes, significant changes have taken place in land use in Sri Lanka (Table 1).

Table 1. Land Utilization within Agricultural Holdings

Land Use	Area (ha)	Percent
1. Major plantation crops (tea, rubber, coconut)	798,103	39.7
2. Other permanent crops	176,500	8.8
3. Asweddumized paddy	556,982	27.7
4. Temporary crops other than paddy	195,048	9.7
5. Wood and forestland	54,129	2.7
6. Pastureland	20,097	1.0
7. Cultivable area but not cultivated	91,648	4.6
8. Area under roads and buildings	75,416	3.8
9. Rocky and wasteland	40,805	2.0
Total	2,008,728	100.0

Source: Statistical Pocket Book - 1991.

AGRICULTURE

Over the last 50 years, agriculture has continued to play the leading role in the economy of the country. An estimated 1.8 million families are engaged in non-plantation farming which is dominated by smallholders as over 64 percent of the farm families cultivate holdings less than 0.8 ha of land. Agriculture still plays a major role in Sri Lanka's economic development. Agriculture sector constitutes 20 percent of GDP in Sri Lanka (1995) and provides employment to about 35 percent of the labor force exceeding the contribution of any other major sector.

The land development schemes established by the government since 1935, with the introduction of Land Development Ordinance, made the arable areas of the Dry Zone to be the settlements with small farms. Much of the agricultural production of the country comes from the Dry Zone of Sri Lanka. Agricultural support services for small farms in Sri Lanka need to be strengthened and be more production- and market-oriented for socioeconomic development of the country.

In the agricultural sector the National Policy Framework emphasizes the following concerns:

* Provision of high quality seeds and planting material;
* Streamlining of the agricultural extension services including the provision of support services and inputs;
* Integrated farm planning to include production, harvesting, collection, storage, processing, marketing, value addition and export;
* Institution building include organizing of farmers and restructuring of agrarian services centers as production centers catering to all needs and the supply of requisite inputs for farming; and
* Integrated approach by the State, private and NGOs.

Paddy

Paddy is the staple carbohydrate of the Sri Lankans and is important to the nation's economy *via* saving of foreign exchange through import substitution and employment of a large segment of the rural population. About 1.8 million farmers or 10 percent of the total population are engaged in paddy cultivation. Rice accounts for 45 percent and 40 percent of the per capita calories and proteins, respectively in the Sri Lanka diet. Hence food security by pursuing a policy of self-sufficiency in the major staple, rice should be a major policy goal.

The total extent of paddy area increased from 0.487 million ha in 1957 to 0.835 million ha in 1993 showing an increase of 74 percent during this period. The increase in the area due to the Mahaweli Programme was 139,229 ha or 40 percent. However, it is found that of the total extent only 66 percent is cultivated in the *Maha* season and 0.246 ha or 34 percent is cultivated in the *Yala* season. Almost all of the paddy production comes from small farms.

Dramatic changes have taken place in Sri Lanka's rice production in the last few decades. The main factors for this development are the area expansion (32 percent) and seed-fertilizer technology (68 percent).

The present total production inspite of the significant reduction in the total area sown in both seasons has been in the range of 2.5 million mt/year. It is significant that the local production met 90 percent of the rice demand in 1992, which increased the requirement by 35 percent in the last two decades (1972-92). During the same period population growth was 39 percent and it is estimated that the population has increased to 20 million in the year 2000. Presently the annual increase in demand is about 25,321 mt. Assuming that the growth in population each year is 2 million, the rice demand by 2010 and 2020 will be 2.37 and 2.63 million mt, respectively. This will be nearly 50 percent of the present local production of rough rice. To achieve such an increase at the present levels of cultivation, the yield per hectare has to be increased from 3.5 to 4.5 mt/ha, a target that may not be too difficult to achieve. The present imports are in the region of 14 percent of the total demand. A multitude of problems confronts the growth of the paddy sector. The problems are:

* stagnant yield: Both production and yield have been stagnant since 1984. The yield is 3.5 mt/ha in all districts and under diverse systems of cultivation. Although the past experience is disappointing, increase in yield is a feasible proposition and concerted research efforts are urgently required to increase the yield to 4.5 mt/ha which not an impossible task.
* low cropping intensity: A declining trend has been noted in cropping intensities in all paddy-growing regions (except in the mid-country Wet Zone). This trend continues. The cropping intensity in the low country Dry Zone is around 110 percent, which includes both major and minor irrigation areas under paddy. In the major areas the cropping intensity is around 130 percent. A significant yield increase could be achieved if the cropping intensity is increased in both seasons, and in particular in the *Yala* season.
* inadequacy of certified seeds: The present level of certified seed availability is around 4 percent of the total demand. During 1991-94 the issue of seed paddy has been only 190,000 bushels although the requirement has been in the range of 4.7 million bushels. The yield increase due to the use of high quality seed has been estimated at 5-20 percent.
* use of long-aged varieties: The trend in the past decade is the increased use of 3 months and 3.5 months-aged varieties while 4.5 months variety was on the decline. The long-aged varieties yield more and tolerate stress conditions too. The cultivation of long-aged varieties should be encouraged by issue of certified seeds and timely water issues in the major irrigation schemes.
* low productivity and high cost of production: Besides the stagnating productivity low profitability and high cost of production is a serious problem facing the paddy farmers. The present average cost of production is Rs.9,900/acre in *Maha* and Rs.8,800/acre in *Yala* seasons. Sri Lanka has been noted as the highest cost producer of paddy under irrigated conditions (US$462) within selected countries. The labor cost component is highest, on an average 44-48 percent in irrigated paddy and 50-59 percent in rainfed paddy areas, followed by material inputs (30-40 percent) and draft power (20-30 percent). High labor cost is due to the use of additional man-days (124). Efficient use of labor and labor saving devices are required, if the major component of cost of production is to be reduced.
* crop diversification: In terms of increasing farmer incomes, switching to other field crops (OFCs), particularly with export potential where agro-ecological conditions permit, diversification will be an alternative attractive proposition. The rainfed areas will have a wider choice of this option. However diversification should not be detrimental to present trends in rice production, and paddy under high potential major/minor irrigation areas should be intensified to maintain high yield levels.

Other Field Crops

OFCs are an important group of crops grown under rainfed upland or under minor irrigation schemes in the Dry Zone. They are grouped into four main categories comprising of 12 important crops. Grain legumes (green gram, cowpea, black gram and pigeon pea), coarse grains (maize and kurakkan), oilseeds (groundnuts, gingelly and soybean) and condiments (large onions, red onions and chillies).

This is a high income-generating group of crops although, at present the profit margins are small due to low market prices, high input and high labor costs. There is also a general trend in declining prices and profitability of most OFCs despite the seasonal variations in production.

Usually most of the rice farmers are also engaged in OFC production, excepting a small percentage whose main occupation is OFC production, particularly chilies and onion growers. There is high potential

for self-employment opportunities with these crops. On a rough estimate about 250,000 people are directly involved in the cultivation of these crops with an equal additional number that indirectly benefit from processing and marketing.

The policy on OFCs would be to maintain sustainable production, improve incomes of field crop farmers, increase employment opportunities in the rural sector and improve the nutritional status of the population. OFCs could be used as livestock feed, an avenue for increasing production of OFCs thereby enhancing farmer incomes, while providing a balanced diet. Presently about 40,000 ha or 10 percent of the total irrigable paddy lands are diversified although the estimated available extent is over 80,000 ha. The crops diversified are chilies, onion, green gram, black gram, cowpea, soybean, groundnut and vegetables. Sometimes banana, sweet potato, gherkins and new crops such as melons, baby corn, and hybrid maize are also cultivated. The production in rainfed uplands in the Dry and Intermediate Zones together with the diversified cropping in paddy lands have achieved a high degree of self-sufficiency in major OFCs.

Besides supplying the domestic market, a vast potential exists to grow high value new crops and new varieties of existing crops with comparative advantage for export as out-growers on contractual arrangements with export-oriented companies. This will provide opportunities for self-employment and indirect employment in processing and marketing of value-added products.

Major constraints for increased production of OFCs includes lack of adequate marketing facilities and exploitation by middlemen. The floor price needs to be fixed at a level that will help the farmer to obtain a viable income. Inadequate transport, assembling, sorting, grading, storage and packing facilities hamper the expansion of cultivation and often farmers suffer due to seasonal gluts and lack of demand. Storage facilities are highly inadequate due to lack of organization, causing heavy losses. The current policies with regard to import of commodities falling within this group of crops have a negative effect on the efforts to increase production. Low prices of imported commodities compete with the locally produced commodities and cause a disincentive to the farmers. High costs of inputs (fertilizer and insecticides), lift irrigation, labor, inadequate irrigation facilities, particularly under minor irrigation schemes and heavy postharvest losses are also major constraints.

Horticulture

Sri Lanka's horticulture is dominated by about 35 species of fruits and 40 species of vegetables produced on approximately 100,000 ha and 90,000 ha, respectively distributed across the country in all agro-ecological zones. The annual production value of fruits and vegetables is estimated at Rs.20 billion, which is half the value of all food crops. Average yield at 7-11 mt/ha is higher compared to rice (3.5 mt/ha) and the crops have a higher income-generating potential, because 0.2 ha produce almost the same monetary (rupee) value as the total rice crop grown on 0.8 ha. Production of fresh fruits and vegetables is estimated at about 800,000 mt of which about 60 percent is consumed and 30-40 percent lost due to storage and wastage, respectively. A small quantity is exported. Per capita consumption of fruits and vegetables is still much lower than the recommended values and the potential exists to double the consumption with a short period, provided their availability and affordability are ensured and the public are made more aware of their nutritional and health values. A significant change in the industry has been the growth in export earnings from horticultural crops and has made horticulture the fastest growing sub-sector in the agricultural economy of the country. The value of increased floricultural exports is still more impressive. It has increased from Rs.30.7 million in 1983 to 287.4 million in 1993 with live plants and cut branches/leaves dominating exports. They, plus the category of bulbs/corns/tubers, have shown consistent growth in exports, whereas the export value of flowers has been stagnant during the last few years due to the lack of opportunities for improvement. Since costs of production of flowers and plants are escalating in European countries opportunities exist for Sri Lanka to attain rapid export growth. High priority must be given to this sector with adequate infrastructure development and substantial increases in inputs.

Export Agriculture

Sri Lanka exports a wide variety of agricultural produce, apart from the major commodities, tea, rubber and coconut. These are within the purview of the Department of Export Agriculture and include the beverage crops, coffee and cocoa and the spice crops, cinnamon, pepper, cloves, cardamom, citronella, nutmeg,

arecanut and betel. These crops are estimated to occupy a land area of about 67,500 ha while earning Rs.5,800 million as foreign exchange. This is more than what is earned from exports of rubber or coconut.

Production is largely confined to the Wet Zone and is carried out mainly in smallholdings and home gardens and is characterized by mixed cropping. Yields are below optimum due to poor management. Consequently data on area and production is not very reliable. The potential for expanding the acreage lies in diversifying coconut and rubber production in uneconomic tea lands. Being mainly export-oriented, the performance of this sector would be monitored through exports. Primary export commodities are subject to price fluctuating and the crops mentioned above are not an exception. Except in the case of cinnamon, Sri Lanka's share of world trade is small and little can be done by way of influencing quantities produced. Fluctuating prices of these crops increase risk and consequently there is little or no new investment.

Presently, the Department of Export Agriculture implements a scheme to assist farmers in the form of outright cash grants by way of planting materials, fertilizers and technical advice. The program does not appear to have had much impact. In November 1992, a price support scheme referred to as the *Security Price Scheme*, was introduced. It covers pepper, coffee, cloves and nutmeg. The Department pays growers the difference between the "current" local market price and a threshold minimum to cover cost of production and reasonable profit.

AGRICULTURAL SUPPORT SERVICES

Agricultural support services include the technologies and resources associated with agricultural production process. As defined by the FAO "agriculture support services denote the full range of services including material inputs, credit, extension, agro-technical training and marketing infrastructure". Farmers should be provided support services to make their farming activities a success. Most important among those are the input supplies, advisory and farmer guidance or the extension, agricultural credit, crop insurance and marketing of the produce. These services are being provided by the government or the State sector agencies, NGOs and private sector. When State sector or the NGOs fail to provide the credit facilities, individual moneylenders play a major role in agricultural credit. Even though conditions are unfavorable with the moneylenders, availability of money in time is much better than the formal and conventional type of credit facilities provided by the banks and other agencies. The State sector agencies concerned with providing support services, are the agrarian service centers, cooperatives, research, extension and training units of the Department of Agriculture (DOA) and the Provincial Departments of Agriculture in the eight provincial councils, banks, Agricultural Insurance Board and the Cooperative Wholesale Establishment (CWE). With regard to marketing, which is considered a very vital component, the private sector plays a significant role in purchasing the produce, bringing in greater competition to the local market, raising the prices of produce, and thereby benefiting farmers.

Input Supplies

Fertilizers and agrochemicals and seeds are the more important inputs, which must be supplied to farmers. It is essential to provide specific inputs in adequate quantities at appropriate time.

Fertilizers and Agrochemicals

All sectors of agriculture use fertilizers widely to increase crop yield. Hence imports have increased by 42 percent in the last decade. The subsidy scheme played a vital role in the increased use of this input for 30 years, which was withdrawn in 1990 causing hardships to smallholder farmers. As a relief to the farmers, a 30-percent subsidy for paddy was reintroduced commencing from the 1994 *Maha* season. Paddy yields have increased by 30-40 percent due to fertilizer use consuming over 43 percent of the total imports.

The OFCs used only 4-5 percent of fertilizer and their yields remained low due to least input use and poor management. Although 25 years have elapsed since the discovery of Eppawla rock phosphate, a phosphate fertilizer that could be used for rice and annual cropping. The traditional practice of using organic manure in recent years is virtually nil with adverse effects on soil fertility and productivity. In 1978, control on fertilizer imports was removed and private firms are now importing in addition to government corporations. There are four main groups distributing fertilizer at the retail level. They are the Multipurpose

Cooperative Societies (MPCS), agrarian service centers, private dealers and various government agencies. Private dealers play a major role in the retail fertilizer sales in the country.

Similarly agrochemicals (insecticides, fungicides and herbicides) are also widely used often in excess, causing serious environmental and health hazards with long-term consequences. All rice pests are controlled by highly toxic organophophorus systemic formulations, while over 50 percent of the rice area is under chemical weed control. Insecticides are also used to control pests of other food crops, they account for 75 percent, followed by herbicides (12 percent). Indiscriminate use of agrochemicals has negative effects on beneficial insects creating natural imbalance in the ecosystem and destruction of biodiversity. Agrochemicals are imported by both the Ceylon Petroleum Corporation and the private sector. At the retail level, these chemicals are distributed by the MPCSs, agrarian services centers and private dealers. The larger agrochemical firms have their own field advisory services and carry out farm demonstrations to promote their products.

With regard to the use of fertilizer, it is recommended:

* to use straight fertilizers to reduce cost per unit of fertilizer, effecting a saving of about 30 percent of the cost.
* maximizing of the use of locally available organic materials such as paddy straw combination with inorganic fertilizers.
* provision of specific fertilizer recommendations by use of analytical service established in different areas.
* provision of training in efficient fertilizer use technology (methods of application, timing, etc.) to both dealers and farmers.

For the usage of agrochemicals it is recommended:

* integrated pest management (IPM) would be expanded to cover more rice farmers. IPM would be extended to other crops such as vegetables and highland crops.
* research and development on biopesticides, insect repellents, other environmentally-friendly pesticides.
* strengthening the extension service and farmer training on the use of pesticides, IPM programs and safety procedures.

Irrigation

The major share of the public investment during the 1978-86 period went into irrigation and agriculture. Most of this investment was made on the accelerated Mahaweli Development Programme. Following the completion of the accelerated Mahaweli Programme the trend was to move away from investment in new irrigation projects. Rehabilitation of existing irrigation projects and village works and handing over the management and maintenance of irrigation schemes below the distributory canal level to farmer organizations are the current directions in policy. All the irrigation schemes are in the State lands and are with small farm holdings.

In rainfed areas a policy for irrigation of limited extents of land using agro-wells is being vigorously pursued. This responsibility has been undertaken by the Agriculture Development Authority of the Ministry of Agriculture. The subsidy scheme for construction of agro-wells and micro irrigation systems under these wells is in operation providing Rs.30,000 for a well and Rs.30,000 for a micro irrigation system. The minimum scale of the well should be 15 ft in diameter and 20 ft in depth with a water level of 6 ft during dry season. Micro irrigation system would be the drip irrigation or the sprinkler system. It is intended to produce OFC including vegetable during off-season when the supply is equal or below the demand to get a good price to the small farmer.

The main objective of irrigation policy in Sri Lanka is to realize the returns to investment on irrigation through:

* increase in productivity and efficiency in the use of irrigation water.
* improvement of living standards of the farming community.
* food security for the nation

* general improvement of a sustainable environment through development of social and institutional infrastructure.

Seeds and Planting Material

Until 1985 the sole supplier of certified seed was the DOA. In 1986, the government decided to devolve the production of certified seed. However, the government farms still continue to sell the seed stocks produced by the DOA at subsidized prices. Through its Seeds Division, the DOA has the capacity to produce foundation and registered seed for paddy and OFCs. The seed multiplication system starts with breeder seed, which is maintained and multiplied by plant breeders. Foundation seed is multiplied from breeder seed in selected production farms under the supervision of the plant breeder. From foundation seed, registered seed is produced in the government seed production farms. Certified seed, which forms the final stage of the multiplication system is produced in selected farmers' fields or of contract growers under the supervision of the officers from the Farms Division. Certified seed is purchased by the Seeds Division and redistributed to farmers through the agrarian services center. Certified seeds are purchased only after they are tested and verified by the seed laboratories of the Division to have confirmed with established standards.

The private sector has, nevertheless, during the last few years, managed to build up a reasonable market, which shows a clear trend of success. Consequently, many new varieties of seeds, especially vegetable seeds, became available in the market. Yet the supply of seeds and planting materials is inadequate to meet the annual demand. The use of sub-standard seeds and planting materials adversely affects agricultural production and farmer income.

A serious problem is the lack of seeds/planting material of *suitable varieties of fruits and vegetables*. Initially they would be imported but research and development of breeding would be pursued vigorously. The local seed industry would focus on long-term sustainable seed production where the government institutes will supply the breeder seeds, while farmer organizations, NGOs and the private sector will produce the commercial seeds. Necessary incentives would be provided to develop a thriving private sector seeds industry.

It is suggested:

* production of seed and planting materials of all mandated crops to meet the demands of farmers.
* testing and certification of seeds of both locally produced and imported crop varieties prior to issue.
* encouraging private sector and NGOs to invest in the seed industry.
* organizing an efficient system of delivery to assure timely availability of quality seeds and planting materials.
* research and development into new varieties and hybrids through the use of biotechnological approaches by both government research institutions and universities.

Agricultural Mechanization

It is not possible to obtain a reliable estimate of the existing machinery used for agriculture in the country at present. The mechanization trend has followed the policy to achieve self-sufficiency in rice production. As such only rice production has achieved a significant degree of mechanization in comparison to the OFCs. Farm Mechanization Research Center of the DOA is conducting research to introduce appropriate mechanical implements to the small farmer.

Mechanization technology could contribute to reduction in the cost of production. The problem, however, is to identify the correct technological inputs. Better handling and consumer presentation also could bring in better price incentives to the producer. Thus in keeping with the government policy of moving away from subsidies as incentives to agriculture, these two alternative paths would provide least conflict with the existing government policy.

However, a crippling limitation to mechanization is the capacity of the majority of the farming community to invest on mechanization technology. Second major constraint is the limited domestic market opportunities for the local industries to produce cost-effective agricultural machinery to compete with imported agricultural machinery. Still another serious limitation will be the rising energy costs, which will restrict mechanization unless cost-effective alternative power sources are utilized. It is necessary to take into consideration these major limitations to mechanization.

Postharvest Processing and Technology

Postharvest handling, storage and processing of agricultural produce is one of the most important and yet relatively neglected areas of technological inputs to agricultural production. About 20-45 percent of the food crops, grains, root crops and export crops produced locally are lost due to poor pre- and postharvest practices and non-availability of appropriate technologies. The annual losses due to postharvest wastage in paddy alone is estimated to be Rs.4,400 million leaving out quality losses. The minimizing of postharvest losses and agro-industrial processing would increase self-reliance in food, value-adding, increase of farmer incomes and diversify employment.

Appropriate postharvest handling and technology would, reduce losses of durable (grains and legumes) and perishable (fruits, vegetables, root crops, etc.), crops at field handling, storage and processing; value addition to agricultural products and creation of gainful employment opportunities; regulate price depressions/escalations during production gluts/scarcities through preservation, processing and storage; increase the export potential of the local agricultural produce and adapt sustainable technologies for food processing and storage.

Postharvest processing and technology has to be implemented at three levels viz., farm level, commercial level and industrial level. Only activities at the farm level are discussed here. There is much to be done to improve the handling, processing, packaging and transportation at farm level. Up to now very little attention has been paid to introduce technology at farm level. Lack of knowledge on the part of farmers has considerably reduced income which might have been possible. The problems at farm level are discussed below.

1. ***Timing of Harvesting for Handling and Transportation***

Lack of awareness of farmers on timing of cultivation operations and harvesting, handling and transportation contribute to a considerable loss of produce at farm level. Advisory and education services to the farmers can contribute to a significant improvement in reducing loss at harvest.

2. ***Cleaning, Sorting and Grading***

At present cleaning, sorting and grading are done at the commercial level following transportation from rural to urban areas. This causes loss of income to the farmers due to apparent low quality. Transport of uncleaned and unsorted vegetables pose additional environmental problems in the urban area as garbage. Introducing simple technology and extension for cleaning, sorting and grading at the farm level, coupled with proper packaging, handling and transportation, will lead to value addition at the farm gate and enhance prices received by the producer.

3. ***Storage***

Only limited quantities of grains such as paddy, grain legumes, onions, chili are stored at farm level. Financial constraints faced by majority of farmers forces them to dispose off the produce immediately at low prices. Poor storage methods practiced by farmers would be improved. Wherever possible, a blend of traditional methods and modern technology would be applied.

4. ***Drying, Preservation and Packaging***

To a limited extent, perishables such as bitter gourd, brinjals, jack fruit and breadfruit are sun-dried and packed in polyethylene. Other produce such as lime is pickled and paddy is parboiled and dried. Adverse weather conditions and maintaining sanitary conditions are problems needing attention and technological inputs. Difficulties in marketing is a main constraint in localized processing. A purchasing network for such products would be established.

The Rice Processing and Development Centre (RPRDC) at Anuradhapura is mandated to carry out research on all durable crops. RPRDC also has the mandate to develop farmer processing units and continue to provide technological information and guidance to small-scale producers.

Marketing of Agricultural Products

Since 1977 it has been the government's policy to encourage the role of the private sector in marketing, storage and processing activities, and to focus public sector activities on stabilising produce prices within acceptable limits of seasonal price variation through the Guaranteed Price Scheme for paddy and the Floor Price Scheme for OFCs.

The Paddy Marketing Board and the Multi Purpose Cooperative Societies were the main purchasers of paddy and OFC, respectively before 1979, but virtually all purchases are now made by the private sector. Although the government is committed to continuing the operation of its Floor Price Scheme, its intention is not to restrict the trade in paddy and subsidiary crops carried out by the private sector, and it expects that the private sector capacity will expand. Private traders offer prices depending on the demand and supply of goods in the open market.

In terms of the increase of costs, paddy production has become an unprofitable farm enterprise as compared to other alternative crop and livestock avenues available to the farmers. Producer fairs or weekly fairs are also a popular marketing outlet for agricultural produce. OFCs mainly vegetables have been marketed in these fairs.

Agricultural Extension

The attainment of much of the desired production objectives will depend on the extent to which agricultural extension services are provided to the farmers on time and their appropriateness. Agricultural extension was devolved to the provincial councils under the 13th Amendment to the Constitution. The extension services for paddy, OFCs and horticulture and floriculture are provided by the Provincial Department of Agriculture. Provincial Department of Agriculture is being headed by the Provincial Director of Agriculture and there are Deputy Directors to assist him in carrying out his responsibilities. Also there are Zonal Directors and Divisional Directors. The last person of the organization is the Agricultural Instructor covering up the functions of the Department at the agrarian service center level. Village level officers of the Agrarian Development Department, known as Agricultural Research and Development Assistants, carry the message of extension to the farmer. This hierarchical order is similar to all the eight provinces in the island.

A field cadre of nearly 2,000 officers all over the country from the DOA, Department of Minor Export crops, Coconut Cultivation Board and Livestock Production and Health are serving as front-line extension agents. Many extension programs which now operate in the field are administered both by public and private agents, including NGOs, working directly with the extension staff.

In addition to the government extension system, companies involved in agricultural input supplies and NGOs also provide extension service for limited objectives. The noteworthy NGOs involved are, Cooperative American Relief Everywhere (CARE) International, World Vision, Freedom From Hunger Campaign, which are internationally operating NGOs and Sarvodaya, the native but internationally renowned.

Extension services of public sector are integrated at all levels and execute common extension program at village level. It is better to integrate extension services of all agricultural agencies to avoid duplication of expertise and financial resources leading to waste of resources that can be utilized for the well-being of the small farmer.

Institutional Credit

Out of the total number of small farmers only a small percentage avail themselves of government-assisted credit. Institutional credit accounts for only 25 percent of available rural credit in Sri Lanka. Low recovery rates, estimated at 60 percent for crop loans is the main reason for the low availability. The reason for the high level of default is partially due to farmer attitudes towards money loaned by banks. State banks are considered extensions of the government, and they lack effective sanctions against loan defaulters other than making them non-eligible for further loans.

While majority of the farmers, credit finance their paddy crops, only a few had opted to or had access to institutional credit. A complexity of factors appear to have led to this situation. In addition to the problem related to the borrower and the guarantor defaulting, consequently reducing the number eligible for institutional credit, the existence of complexities of tenurial conditions appeared to have resulted in increased private borrowings. For example, under certain informal tenurial arrangements landowners themselves undertook to provide material inputs as a part of the contract of the tenure arrangement. This meant that many cultivators are not eligible for institutional loans.

Linking up institutional lending with crop insurance also appears to inhibit farmers approaching the banks for paddy loans. Farmers are generally reluctant to obtain crop insurance for many reasons. One major reason according to farmers was that the indemnities were too low. Lack of awareness of the insurance scheme, delays in payment of indemnities and the inability to pay the premium are other reasons for farmers' reluctance to obtain crop insurance.

Farmers generally found that obtaining credit from non-institutional sources was easier and flexible than from institutional sources. Farmer's social and economic relationship with the lenders appeared to be fairly established at the village level, lending to a smooth disposal of credit and recovery. Non-institutional credit is used mainly for short-term crop production and often carries very high interest rates. Even under such circumstances farmers prefer to have this as it does not involve cumbersome loan application and approval procedures.

Main sources of institutional credit are the Bank of Ceylon, the People's Bank and the Regional Rural Development Bank. Under the new comprehensive rural credit scheme, crop loans are made available to farmers who carry agro-identity cards issued by the Agrarian Service Department, who can offer two acceptable guarantors, and who are not defaulters. Loans ranging from Rs.5,558 for irrigated paddy to Rs.11,733 for chili and Rs.16,673 per ha for onions are granted to farmers at 9.5 percent interest per annum repayable in full at the end of the crop season. The loan covers land preparation, seed purchases, transplanting, fertilizers, agrochemicals and harvesting. Defaulting farmers will be given the chance to reschedule their loans, and on paying 10 percent can receive a new loan immediately. However both the overdue amounts and the new loan must be repaid within 10 months. Medium-term loans (i.e., for tractors) are granted to borrowers at 12.5 percent for a period of 3-5 years. Livestock loans are given for six years at 12.5 percent payable monthly with a six month grace period.

Agricultural Insurance

Agricultural insurance is compulsory under the loan schemes and the cost of such insurance is included in the loan. However insurance payments are prorated on the extent of losses, and cover a maximum of Rs.1,476 per ha for rainfed crops and Rs.5,412 per ha for irrigated paddy crops.

Cattle and buffaloes (dairy, draft and stud) come under an insurance scheme with a maximum insurance coverage offered ranging from Rs.2,500 to Rs.6,000 depending on the category of animals and age limits.

Crop insurance also induces farmers to adopt the recommended cropping patterns with greater confidence. However the past performance of crop insurance, particularly in OFCs, has been full of failures and the Agricultural Insurance Board has consequently suffered heavy losses. The Agricultural Insurance Board has recently taken a decision that in spite of its difficulties it will insure OFCs on the basis that indemnification will be limited to 1.3 times the total premia collected from farmers participating in the program. If the total indemnity payable to all claimants is within this limit, they will be paid the full amount due to them. If however, the limit is exceeded, individual farmers will be indemnified on the basis of 1.3 times their premia.

MAJOR ISSUES/PROBLEMS AFFECTING THE DELIVERY OF AGRICULTURAL SUPPORT SERVICES

In the past agricultural research has been primarily focusing its attention on varietal and management improvement on a large number of crops primarily on a monocrop basis, rather than a system of farming. This has led in most instances to the isolation of integrative methods.

The extension program has been attempting to transfer information to farmers mostly on a monocrop basis. Little attention has focused on problems and the economic realities faced by the farming community, both in the development of technologies as well as their transfer.

Agricultural credit too has been a major problem. The main constraint is the inadequacy of collateral, as well the timeliness of the availability of credit during the critical periods of the cropping season. Furthermore most of the credit is processed on a crop basis, rather than on a farm basis. This has led to a situation where farmers, if there was a crop failure, had to incur tremendous losses and become indebted.

The choice and use of appropriate technology is of paramount importance for productivity enhancement in agriculture. The choice of agricultural technology is no easy task. It must be appropriate or adaptable to local conditions and also be environment-friendly. The relatively poor smallholder, in particular one whose knowledge may be relatively low, must be able to understand and afford it. The technology must also be such as to avoid capital-intensive or highly advanced technology not suited to a country with an abundant supply of labor at present. The real challenge is to develop those technologies and cultivation practices which

improve productivity and sustain agricultural development, suitable to the small farmers, while at the same time minimizing environmental degradation.

Technology does not mean only physical technology, which increases technological capability, but also organizational and managerial technology which may be even more important than physical technology.

In terms of marketing it is not unusual for programs to be developed targeting particular crops. However, at the time of harvest when it comes to marketing, markets are not readily available. The private sector is not geared to purchasing and storing large quantities, and with the fading away of the few parastatal organizations, it was left to the organized traders ever so eager to help out with relatively low prices. This scenario still continues without much change.

RECOMMENDATIONS TO IMPROVE THE DELIVERY OF AGRICULTURAL SUPPORT SERVICES

As a larger fraction of the population depends on small farms it is necessary to develop the sector without which the goal of socioeconomic development of the nation cannot be achieved. Support services for small farms should be efficient, effective and time bound to ensure improvement of the sector. Farmers need to be educated about the utilization of available support services. Institutional credit extended to the sector is not adequate to cater to the demand. Instead the private moneylenders play a major role. Farmers' attitude to institutional lending is also not favorable as farmers often presume that repayment of the credit is not necessary. A system of granting loans to the farmers' organizations and entrusting the repayment responsibility to the organization will help to overcome the situation. Fragmentation of farmland is one of the reasons for unprofitability of the agriculture. Though the ownership and the extent varies in a homogeneous area it is better to organize the area as a single farm of collective nature to produce a marketable volume of harvest or yield bringing a farm gate market with a good farm gate price.

Farmers' dependency attitude is one of the greatest problem for farm productivity. Farmers should be educated to understand the effect of the market forces and thereby that to maximizing their profits.

Delivery of support services to the small farm sector needs a dgree of dedication in those who are involved in implementation. They should have a high standard of knowledge and experience. Extension staff should be well trained and updated with knowledge of their field of work. They also need to adopt bottom-up, top-down and horizontal approaches whenever appropriate rather than being limited to any in one system of participation. Human resource development of the extension staff is very vital for proper implementation of support services.

Private sector and NGOs should be encouraged to undertake extension in a broad manner in the areas they are involved in. They may be more effective and efficient than the State sector, especially in input supplies, marketing and transport of goods, etc. The exercise of delivering farm support services, should be done in a participatory basis and the farmers should be considered as stakeholders and not as the beneficiaries.

Large-scale farmers should be encouraged to establish nucleus farms and out-grower system. This will produce a stable market and provide good prices for the produce in small farms. Small-scale farmers will also get accustomed to commercial farming, quality production and packaging.

CONCLUSION

Sri Lanka being an agricultural country most of her food crops are produced from small farms. It is necessary to maintain a strong network of agricultural support services to increase the productivity and the profitability of the small farms. Due to the high cost of production agriculture will not be profitable unless optimum level of inputs are used at the appropriate time and produce brought to the market. It is the responsibility of the government to undertake provision of agricultural support services to small farmers since their capacity to respond to the market forces is very minimal when compared to the well-organized plantation sector. Also with the present liberalized economy a considerable share of this responsibility lies with the private sector and the NGOs. In future the private sector and the NGOs also need to undertake the responsibility of research and education as undertaken in the industrial sector.

After all, the broad objective of good living standard for small farmers should be achieved with the participation of all the stakeholders in the sector.

15. THAILAND

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INTRODUCTION

Thailand is located in the Indochina Peninsula with a total area of about 51.36 million ha. Her territorial boundaries connect with Malaysia in the south, Kampuchea in the northeast to east, Lao PDR in the northeast, and Myanmar (Burma) in the northwest to west.

Geographically, the country may be divided into four regions: the Central, Northern, Northeastern and Southern region. The altitude modifies the temperature considerably. It is cool enough in the Northern region to produce temperate fruits, vegetables (also vegetable seeds) and certain kinds of flowers; cool and dry in the Northeast region, and modestly humid in the Central region. In the Southern region, there is no cool season and the climate is wet, but it is tropical and monsoonal, influenced by the southwest monsoon except for the south. Average annual rainfall and temperature vary, ranging from 998 to 4,603 mm for precipitation and 24.4-29.3ºC (76-85ºF) for temperature.

Administratively, Thailand is divided into 76 provinces, each headed by a governor. There are 787 districts and district branches, 7,404 sub-districts, and nearly 66,604 villages in the 76 provinces. The population in 1996 was over 60 million, of this, 64 percent reside in the rural areas. Approximately 90 percent of the rural people, or almost six million families, earn their income through subsistence farming, particularly rice cultivation and field crop production.

In Thailand, 64 percent of population are engaged in agriculture. Most of them grow a single crop such as rice, cassava, cane, sugarcane, etc. The proportion of income per capita of those engaged in agriculture to other sectors was 1:13 in 1997. Several development programs have failed because there was no realistic assessment of the limited resource base of small farming households. The socioeconomic pattern of the households was not taken into account. Our basic assumption is that small-scale farmers in Thailand will be responsive to development efforts if the technology fits their needs, aspirations and the environment.

SITUATION OF AGRICULTURE IN THAILAND

About 41.5 percent (21.28 million ha) of total area is farm holding land, with some 17.5 percent of this presently under irrigation. This land, both irrigated and non-irrigated, is used by some 5.2 million farm families to produce agricultural goods for domestic consumption and export.

Among the large number of crops of economic significance, rice is the most important and widely grown in all regions and covers about half of the country' s cultivated area. Other major field crops which are cassava, corn, sugarcane, oil crops, perennial trees such as para rubber, fruit trees cover the rest of the area. The utilization of farm holding land can be stated as follows: paddy land, 51 percent; field crops, 24 percent; fruit trees and trees crops, 17 percent; and others, 8 percent. The major planted area is of rice, maize, cassava and rubber. The planted area, yield, production and value of economic crops in 1997/98 are shown in Table 1.

AGRICULTURAL DEVELOPMENT AND SMALL FARMERS

In 1986, 69 percent of the working population of Thailand was employed in agriculture, and produced 22 percent of the GDP. With such a large part of the population still dependent on agriculture, and in view of the limited capacity for expansion of other sectors of the economy, the development of agriculture is

essential to the well-being of the Thai population. In the past 20 years farmers, traders, bankers, researchers and extension workers have all contributed to making Thailand a large producer and exporter of products such as rice, cassava, sugar, fruits and other commodities. Large areas of land have been opened up for cultivation and a considerable part of the farming population has benefitted from this development. Yet there is a large population of rural poor as well. This is particularly true for the northeastern part of the country, which holds 40 percent of the total population of Thailand. The 5th National Plan states that 45 percent of the population of the Northeast is poor and that 52 percent of all rural poor in Thailand live in that area.

Table 1. Planted Area, Production, Yield and Value of Economic Crops

Crops	Area (000 ha)	Production (000 mt)	Yield (mt/ha)	Value (US$ million)
Major rice	9,113.28	18,789	2.06	3,275.39
Second rice	1,156.96	4,791	4.14	825.37
Maize	1,396.64	3,832	2.74	421.52
Cassava	1,071.04	15,591	14.56	491.12
Sugarcane	943.52	46,873	49.68	594.12
Para rubber	1,831.04	2,169	1.18	1,262.90

Source: Office of Agricultural Economics (OAE), 1999.

Generally, poor farmers do not have sufficient paddy land to feed their families. They need cash income to buy rice. The poor quality of land, the irregular rainfall, and low prices for agricultural products make income from cash crops very uncertain. The collection of food and fuel from the natural environment is becoming increasingly difficult as natural resource are diminishing rapidly. Most small farmers try to earn sufficient income by working as laborers or by engaging in home crafts.

Small farmers feel vulnerable, inferior and powerless in relation to others in the village and the rest of society. In order to insure themselves against times of hardship, small farmers will often accept a dependency relationship with a richer farmer, a buyer of agricultural products, a shopkeeper or a moneylender. These people will help them in times of need but at a price. They have to sell their labor or their products to their benefactors at a low price and may ultimately lose their land to them.

Small farmers will only succeed in improving their social and economic status if they mobilize and organize themselves to undertake their own development. The 5th National Economic and Social Development Plan of Thailand states this very clearly. It allocates the responsibility for mobilizing small farmers to the government departments involved in rural development.

In agricultural extension practice, extension officers work with “contact farmers” who are usually the larger, more prosperous farmers. The extension service passes on to farmers new technologies developed by agricultural research and experiment stations. However, these stations operate with the assumption that the conditions for agricultural production are those of the larger farmers. The resources, the farming systems, the problems and priorities of small farmers are different, and consequently they need different solutions based on different research. Such research is lacking, and so are extension programs attempting to reach small farmers.

The National Economic and Social Development Plan also places emphasis on the commercialization of agriculture, moving away from subsistence farming towards intensive mono-crop production for export. However, the share of agriculture in the GDP was 25 percent in the 3rd Plan and declined to about 10 percent in the 7th Plan as shown in Table 2.

Table 2. Share in GDP Value during the 3rd-7th Nation Development Plan

Sector	3rd Plan (1972-76)	4th Plan (1977-81)	5th Plan (1982-86)	6th Plan (1987-91)	7th Plan (1992-96)
Agriculture	25.08	21.39	19.01	14.88	10.30
Non-agriculture	74.92	78.61	80.99	85.12	89.70

Source: National Economic and Social Development Board (NESDB), 1997.

REORIENTATION OF MANAGEMENT OF EXTENSION ACTIVITIES

The Department of Agricultural Extension (DOAE) is aware that in order to mobilize and assist small farmers it will have to introduce some new elements into its management of extension activities.

1. Small farmers will have to be specifically identified and their social and economic situation will have to be studied and taken into account. Specific programs should be developed to help small farmers, especially in areas where they are in large number.
2. The present emphasis on handing down ready-made advice to farmers should be replaced by an emphasis on cooperative problem solving between farmers with the help of extension workers and involvement of researchers.

This means that the present orientation towards command in extension management should shift in the direction of a service orientation. Higher levels of management should primarily try to support the lower level extension worker and ultimately the farmer. This will require the adoption of new roles at all levels of the extension service, and especially by extension workers. Their place should not be above but beside the farmers.

The DOAE is committed to giving more assistance to small farmers and to promoting larger participation of farmers, in their own development. The Department realizes, however, that the required changes in extension objectives and management have yet to be worked out in detail.

THE DEPARTMENT OF AGRICULTURAL EXTENSION

As an agricultural country with most of its population engaged in agriculture and national income derived mostly from farm production, Thailand must develop her agriculture sector, especially as to integration of concepts, strategies, cooperation with research academic institutions, agricultural credit, production inputs, marketing organizations, and other relevant agencies, in order to strengthen the production capacity of farmers. To accomplish this, the Development of Agricultural Extension was established in 1967. This organization under the Ministry of Agriculture and Cooperatives (MOAC) is directly responsible for establishing and implementing a comprehensive agricultural extension program.

The DOAE has been tasked to provide extension services and transfer technical know-how on crop production and agribusiness to farmers; encourage the formation of farmers as a source to acquire and disseminate agricultural information and carry out other activities as enforced by the act or as assigned by the Ministry or the Cabinet.

The ultimate goal of agricultural extension is to help raise farm income and upgrade rural standards of living, which result in stability of the economy and society as a whole. To enhance stable farm occupations and improve the quality of rural life in both economic and social aspects for farm and rural populations, the DOAE organized its responsibilities as follows:

1. To provide ideas to target farmers so that they can engage in their occupation in line with natural environment, biology, production technology, economic, social, cultural and political aspects.
2. To serve as a means of transferring agricultural knowledge and technology from research institutions and other technical sources to target farm population, while taking into account field problems which must be resolved.
3. To promote production of agricultural commodities for local and national consumption, agro-industrial use, and export.
4. To provide services and production inputs for farmers on occasions such as natural disasters, serious plant disease outbreaks and where farmers are not able to help themselves; this is intended to ensure continuous farm productivity.
5. To promote and encourage farm families to form farmer institutions and production groups, in order to ensure cooperative participation in the use of production technology, improved selection of type, quantity, and quality of products; and to use groups as a base for marketing and fair distribution of income.

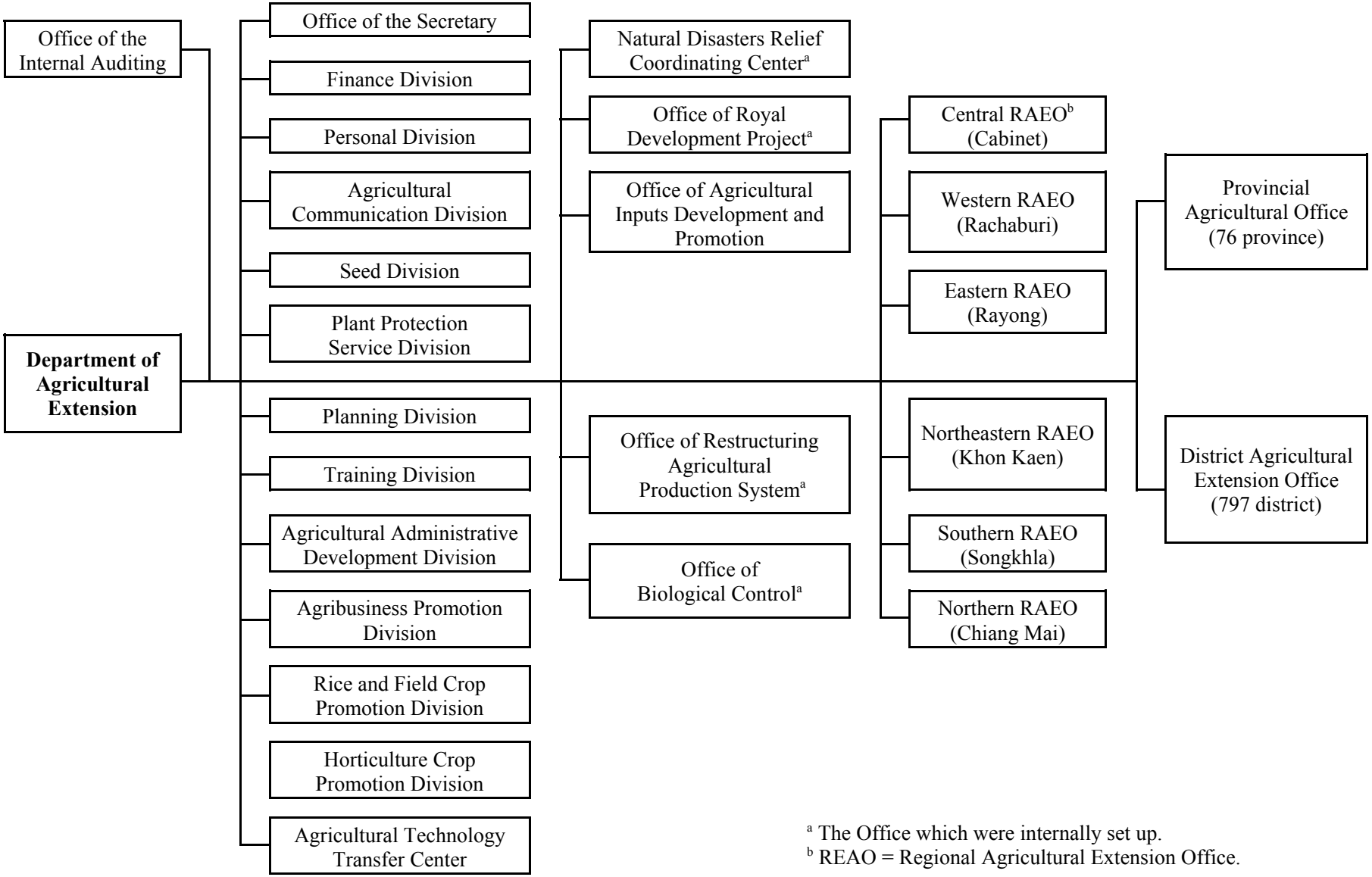

Figure 1. Organization Chart: Functions and Responsibilities

6. To coordinate with other agencies in the MOAC in disseminating technical knowledge on crop production, livestock, fisheries, and forestry at the farm level; and cooperate with agricultural development for the benefit of farmers and the country.

THE NEW CONSTITUTION AND THE EIGHTH NATIONAL ECONOMIC AND SOCIAL DEVELOPMENT PLAN (1997-2001)

The enactment of a new Constitution in 1997 by the Royal Thai Government marked an important step in the ongoing process of democratization in Thailand. Drafted not only by politicians, but also primarily by respected persons from all walks of life, many of which included non-partisan academics, the new Constitution came up strongly in favor of people's participation and the decentralization of power and resources for the strengthening of local government initiatives.

In keeping with the spirit of the new Constitution, the government's Eighth National Economic and Social Development Plan (1997-2001) lays strong emphasis on decentralization, and strengthening local level administration and community-based development. It promotes popular participation and upgrading the community's capabilities to play active roles in local development through:

* upgrading the capacities of rural communities for economic and social development and for conservation of natural resources and the environment;
  enlarging the role of the public sector in promoting increased participation by local communities in local development; and
  encouraging the participation of the private sector and NGOs in community development, so as to give communities freedom to carry out economic activities and provide a greater choice of employment freedom for such ventures.

The attempt to put people at the center of all development activities requires a radical departure from the earlier centralized system of government. It calls for a new system not only on the part of public agencies, but also on that of the people who are encouraged to develop a working partnership among themselves and the public agencies concerned. This action would bring their needs and expectations into development planning, decision-making and implementation. Until now, however, Thailand has remained a highly centralized country with only limited autonomy given to local communities in terms of functions, funding and decision-making. Thus, building the institutional capacities and human resources along with the appropriate legal framework for local governments and community institutions to become more self-reliant is a pressing priority for sustainable rural development.

According to a recent World Bank study on 'Beyond the Crisis – Strategy for Renewing Rural Development in Thailand' (2000) the agriculture sector, key tasks for the future include:

* to enhance community participation in government decision-making, local communities are best at understanding their own problems. Their timely feedback through Civil Society Organizations (CSOs), NGOs and civil assemblies is seen as critical for effective decision-making and people-centered development.
* to develop new participation mechanisms by central and provincial governments that facilitate the input of farmers (small farmers are included), villages, and rural community institutions into policymaking. They need to disseminate information about public affairs widely so as to increase local people's access to and understanding of public issues.
* to provide *Tambon* Administrative Organizations (TAOs) and *Tambon* councils with significant capacity building, which would become an effective tool for decentralization and participation. Training requirements include participatory planning, community development, technical know-how, monitoring and evaluation, administration and financial management.
* to strengthen institutional capacity and financial resources for CSOs to enable them to play a more effective role in local governance and the delivery of social and economic services.

THE ECONOMIC CRISIS – NEED FOR STRUCTURAL REFORM

The economic crisis, which started during the first year of the Eighth Plan (1997-2001), was unprecedented and not foreseen during the Plan's formulation process. A number of adjustments and corrections had to be made, while its basic philosophy was pursued. This philosophy was to adopt a new paradigm that has the development of human potential at heart through popular participation and partnership, which would contribute to the creation of self-sufficiency at community and local levels (NESDB, undated).

In response to the problems that the agriculture sector is facing, the MOAC and OCSC have initiated a comprehensive plan for restructuring that is incorporated into the MOAC Action Plan along the lines of the 8th National Economic and Social Development Plan (NESDB, 1996). The 8th Plan has, as its major objectives, the promotion of community participation in regional and national development matters and the empowerment of the Thai people to play a greater role in the country's decision-making processes. Thus, the restructured MOAC will have

> '*a function-oriented organizational structure and introduce a more decentralized planning process for the agriculture sector by involving the private sector, community-based organizations and NGOs.*'

The focus is to explore improved and new channels for the involvement of local communities and their organizations in the process of agricultural planning and implementation, research and extension. It will also assess their capacities and identify the requirements in order to build a strong interface between government units and the rural population. This study looks at the previous experiences of collaboration and makes suggestions on how to enhance the following:

* Local and community-based organizations with respect to community mobilization, institution building, involvement in agricultural planning, management and credit services;
* The roles of TAOs to participate effectively in the development and management of agricultural plans and programs; and
* A workable approach for demand-driven, client-oriented agricultural research, planning, management and a service delivery system.

AGRICULTURAL DEVELOPMENT PLANNING AND SERVICE DELIVERY

Within the conventional system of agricultural development planning, plans are formulated from the center at ministerial and departmental level, and tasks are assigned through departmental channels down to target province, district, *Tambon*, and ultimately village level. Within the centralized structure of planning, the MOAC's role was primarily to impose new production patterns, inject new technologies, and use new inputs that pulled farmers into the cash economy. The cash economy penetrated traditional rural society, thus, altering the social and economic relationships of the community's production systems. The farmers' role became one of a recipient of infrastructure, inputs and marketing assistance.

The background of the new Thai Constitution, together with the philosophy of the 8th National Economic and Social Development Plan, aims to place the people at the center of development. In late 1998, the MOAC made another effort to involve local organizations in the agricultural planning and implementation process. Within the framework of the proposed restructuring of the Ministry, and in order to improve channels of communication between farmers and the MOAC, local "One-Stop Service" centers in the form of a *Tambon*-level Agricultural Technology Transfer Center (TTC) was initiated to provide a comprehensive range of services. They are assumed to play a key role in minimizing problems of communication by functioning as the focal point for information transfer in both directions, exchange of experience as well as venues for facilitating communication among the local people themselves. The concept of TTCs recognizes the wealth of the farmers' technical knowledge, which has accumulated over the years through trials and adaptation, that remains to be shared among farming communities as well as support agents from outside. It acknowledges that an overemphasis on scientific research disciplines combined with a lack of information on local knowledge systems and networking for sharing and disseminating knowledge have so far been a major factor inhibiting a wider and systematic dissemination of innovations and technology transfer.

TTC and the Local Level Reorganization of the MOAC

Given its limited financial and human resources, the MOAC has hardly ever been able to provide for an adequate level of services, neither in terms of coverage and intensity of interaction, nor service quality. Other major problems refer to a lack of inter-department cooperation that prevents the delivery of technical assistance in an integrated, coordinated and efficient way. Thus, as part of the restructuring program, the MOAC has adopted a policy to adjust its extension and service delivery system in the agriculture sector by setting up so-called **Agricultural Technology Transfer Centers** at *Tambon* levels. They are envisaged to be the major agent of change in agricultural development, as they should link rural people more efficiently with governmental and non-governmental agencies through the generation and dissemination of knowledge and relevant information, and the support and facilitation of self-help activities. The main emphasis is put on a planning strategy by which farmers, communities, farmer institutions and local organizations are responsible for themselves. Local government units will step in only to facilitate contacts, to give advice regarding technical aspects and relevant information, as well as provide other supportive measures.

During a pilot effort in 1999, 82 TTCs were established, which is roughly one in each province of the country, with a budget of ฿1.1 million for each one. During 2000 another 152 will be added. Within the next few years, more than 6,000 TTCs will be set up nation-wide in nearly every *Tambon* of Thailand to operate under the advice of the DOAE.

Objectives of TTCs

The objectives of a community-based agricultural research, extension and service delivery system is to contribute to the improvement of the farmers' livelihood, their self-reliance and occupational security through the promotion of a sustainable production system. In this strategy, key elements of the new mandate for the DOAE are:

* harmonizing agricultural extension operations under one single command, i.e., under the roof of the District Agricultural Promotion Office (DAPO), effectively integrating activities of the Department of Fisheries (DOF), Land Development Department (LDD), Department of Agriculture (DOA) as well as certain extension-relevant functions of the Agricultural Land Reform Office (ALRO), Cooperative Promotion Department (CPD) and Royal Irrigation Department (RID).
* providing One-Stop Services at field level via the TTCs and their network.

TTCs have been conceptualized by the DOAE as the major interface between government agricultural staff units and rural people. They are intended to:

* integrate agricultural development activities better, which were previously divided between different departments;
* provide a forum of cooperation between public authorities, local organizations and the farmers themselves;
* enable rural communities to participate in the analysis, planning and implementation of development activities; and
* transmit agricultural knowledge, information and technology, reduce misuse, and effect a more efficient use of natural resources.

However, as a result of many talks and discussions with the government officials concerned, TAO members and farmers, it is felt that TTC planners need to:

* have a more precise conceptual framework in terms of sustainability and participation;
* have a more precise picture of the principles of participatory technology development;
* be more aware of the pitfalls and challenges for a participatory and partnership-based approach that can be institutionalized within bureaucratic and centralized structures;
* be clearer on the role and limitations of traditional knowledge; and
* be clearer on the implications of community empowerment and local group formation.

TTC Organization Setup

The TTC organization setup, according to a publication of the DOAE, has been designed to operate under a Committee that consists of:

1. District DOAE officer as the Chairman;
2. *Tambon* DOAE officer as the Secretary (Director);
3. Members of other MOAC line agencies, such those from Committee for Cooperatives;
4. Members of the TAO;
5. Members of Village Committees (usually Village Heads and their Deputies);
6. Farmer or farmer group representatives; and
7. Leaders of occupational groups.

The position of the TTC Director, which might be filled by the *Tambon* Agricultural Extension Officer during an initial setup period, all other positions of the TTC Committee, including that of the Chairman, should be subject to open elections by members of their own constituencies. Moreover, there was much consensus that TTCs should be established as independent, demand-driven local organizations, and not as an administrative unit or section of either the DOAE or TAO. Lessons need to be learned from the past experiences of other ministries such as the Ministry of Health, and Ministry of Labor and Social Welfare, which have tried without much success to establish *Tambon*-level service and information centers. The main drawbacks have been their limited capacity to win the cooperation of either the local communities or other line agencies. With its independent status and the strong representation of TAOs within the TTC Committee it is hoped to facilitate a better integration of communal operations through linking up with other activities, such as health, education, social welfare and occupational promotion.

Components and Functions of TTCs

The TTC Committee's main responsibilities in view of the DOAE include the following:

* Developing a database in accordance with the prescribed standards of the MOAC, including an analysis of community needs and demands by using the Participatory Assessment and Planning (PAP) method.
* Identifying and developing relevant and appropriate agricultural knowledge and technologies for farmers, which emanate from the farmers' indigenous technologies or are adopted sources from outside, or a blend of both.
* Looking for ways to facilitate access to and/or provide directly the necessary knowledge, channels and connections, utensils, and tools and equipment for the implementation, analysis and examination of agricultural income-generating activities.
* Encouraging and supporting the so-called 'demonstration and technology transmission stations' of progressive farmers or farmer groups through training, study tours, plan for dissemination of the technology, and necessary equipment by using farmers and local leaders as resource persons.
* Facilitating and analyzing the feasibility of various agricultural community plans and aggregating them into a joint 5-year *Tambon*-level development plan, including a budget breakdown as well as annual action plans and community-specific plans.
* Supervising, monitoring and assessing the implementation of the plan(s).

The TTCs' main trust is related to:

* planning agriculturally-related development activities at *Tambon* level, and setting up operational budget plans and a time frame.
* analyzing feasibility, supervising implementation, and assessing the impact of these agricultural development plans.
* following up activities that report back on progress, problems encountered and obstacles to the District Agricultural Development Committee, which is chaired by the District Chief.
* carrying out other possible activities, as assigned by the District Agricultural Development Committee.

Expected Results and Impact

The majority areas of responsibility and expected outputs of the TTCs should refer to the following areas:

* Information generation and dissemination: be a source of and provide agricultural information and initiate the IT system.
* Research and experimentation: design, implement and evaluate experimental and demonstration plots/ trials.
* Technology transfer and dissemination: provide agricultural technology through its transfer network.
* Planning: assist stakeholder groups in participatory planning with the intended output of an agricultural development plan, which takes into consideration the local community's responsibility in looking after their immediate natural resources and environment.
* Training: carry out meetings, training, field visits, and study tours to internal or external sites.

The expected results from TTCs that function well could be summarized as follows:

1. ***In Terms of Household Production and Community Economy***

* Increased systematic integration of production and marketing on the one hand and improved self-sufficiency and subsistence production on the other.
* Improved and increased equitable achievements in agricultural production through new products, an improved quality and quantity of previous productions, and more advantageous marketing links.
* Developed and implemented agricultural community plans, based on community negotiations and overall community needs.
* Increased efficient and client-oriented provision of services that include the reduction of steps needed for farmers to follow when seeking technical assistance or advice.

2. ***In Terms of Knowledge and Information Access, Generation and Transfer***

* Improved mutual learning, as the TTCs act as a learning center for the community.
* Enriched development of human resources through the screening, upscaling and blending of traditional knowledge, local wisdom and community experience with scientific knowledge and expertise.
* Increased utilization of existing knowledge enhanced through the exchange of technical know-how on improved production between (and among) local residents, government agencies, NGOs and the private sector.
* Increased local capacities in using and analyzing data for project identification, planning implementation, feasibility and impact assessment, and M&E.
* Improved availability and use of appropriate, accurate and timely data.

3. ***In Terms of Social Issues***

* Strengthened and empowered farmers, farmer groups and communities to analyze and solve problems on their own by using and increasing their local potential without relying too much on outside assistance.
* Strengthened local mobilization and organization.
* Increased rights and decision-making authority for local people.
* Identified common and group-specific interests (rural women and landless people, as examples)
* Developed compatible perspectives and increased mutual acceptance of different interests and views through the ability of negotiations and sense of ownership.
* Promoted networks through linking up with other TTCs, higher-level research, service providing agencies and other non-governmental stakeholder groups.
* Enhanced transparency and accountability.
* Harmonized spirit of democratization and decentralization of political and administrative power.
* Increased coordination within and between government agencies.
* Changed role of government agency staff from service/input provider to facilitator, coordinator and adviser.

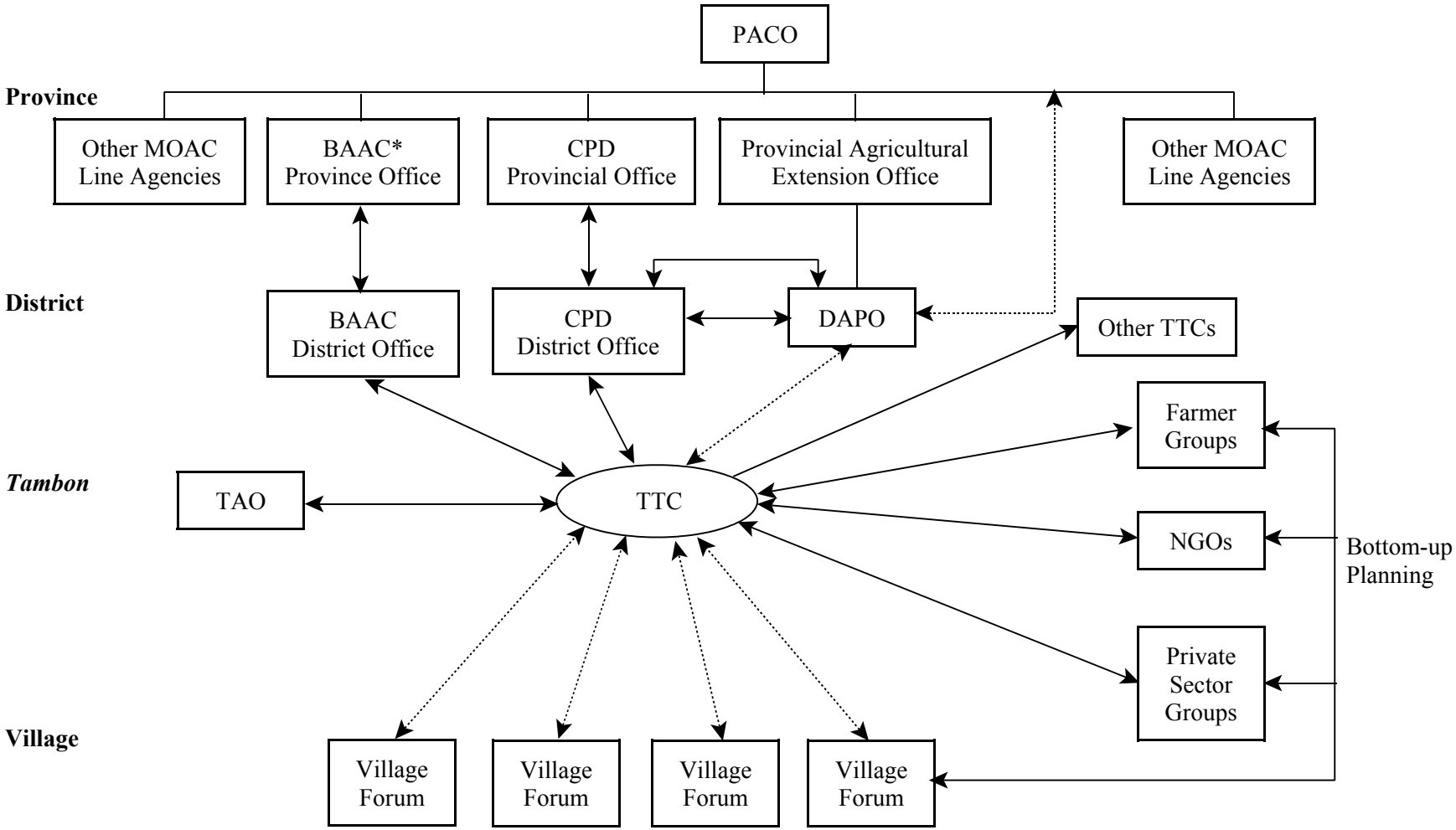

Figure 2. Organization and Management

Note: * Bank for Agriculture and Agricultural Cooperatives.

REFERENCES

Asia Development Bank, March 2001. "Restructuring of the Ministry of Agriculture and Cooperatives (MOAC)", ADB Technical Assistance Project No. 3261 – Thailand, Final Report, Volume III, "Community-based Agricultural Development: Challenges for the MOAC".

DOAE, 1993. *Introduction to Department of Agricultural Extension*, Third Edition, Bangkok, Thailand.

----------. "Small Farmer Participation Project (SFPP)" brochure (8 pp.).

National Economic and Social Development Board, 1996. *The Eighth National Economic and Social Development Plan (1997-2001)*, Office of the Prime Minister, Bangkok, Thailand (in Thai).

Office of Agricultural Economic, 1999. *Agricultural Statisties of Thailand Crop Year 1997/98*, Ministry of Agriculture and Cooperatives, Bangkok, Thailand (in Thai).

16. BHUTAN

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INTRODUCTION

Bhutan is a small landlocked country measuring about 46,500 km^2 and is situated in the eastern Himalayas. It borders China the north and India in the south. The altitude varies from the northern high ranges of more than 7,000 m to the southern foothills of 150 m. The central region of the country comprises of the north-south oriented than 5,000 mm in the south. The climatic conditions vary from hot, humid in the south (ranges of the inner or middle Himalayas; rainfall varies from 400 mm in the north to more temperatures between 15-30ºC) to temperate in the middle region to alpine in the north.

Bhutan is predominantly a Buddhist Kingdom with a population of 600,000 and an annual growth rate of 3.1 percent. Approximately about 85 percent of the population live in the rural areas. Settlement patterns are principally determined by the topography. Most of the settlements are along the southern foothills and the central region valleys. Bhutanese society is matriarchal and women enjoy equal status with men both in law and at home. However, in the agriculture sector training is directed mainly towards men. In recent years a gradual increase in women participation has been observed.

Bhutan is ranked as one of the least developed countries. Most Bhutanese farmers own land, and housing in the rural areas is of good quality. With the small population size the ratio between the population and cultivable land is highly favorable. Given a favorable economic situation and political stability the Bhutanese approach to development is guided by the principle of "Gross National Happiness" (GNH) rather than "Gross national product". The GNH approach to development is put into practice through the national development policy of self-reliance, sustainability, preservation and promotion of culture and traditional values, national security, balanced development, improving the quality of life, decentralization and community participation, privatization and private sector development.

AGRICULTURE: THE BHUTANESE APPROACH

Agriculture has been and is still the primary activity in the Bhutanese society. Bhutan embraced modern development activities in the early 1960s. Since then, the government through its five-year planned development activities has always accorded priority to the agriculture sector. Agricultural development was viewed as crucial in the development of the rural populace.

The agriculture sector also known as the renewable natural resource sector is the single largest and the most important sector in the Bhutanese economy. It provides employment to 90 percent of the total population and contributes 45 percent of the GDP. It comprises of agriculture, animal husbandry and forestry. During the Seventh Five-Year Plan (FYP) (1992-96) the sector registered a modest growth rate of 2.9 percent per annum. While the crop sector grew as a result of higher productivity, the share of forest and livestock declined in 1990. The reason cited was restriction on logging and reduction of cattle rearing to prevent soil erosion, deforestation, etc.

Agriculture in the Bhutanese context consist of two major categories viz-à-viz horticulture and traditional foods, namely:

1. ***Horticulture***

Bhutan has significant regional and seasonal comparative advantage in the production of horticulture crops, particularly in subtropical and temperate fruits and in the supply of potatoes and vegetables to off-

season (summer) markets in the neighboring areas of India and Bangladesh. The main horticulture products traded are oranges, apples, potatoes, ginger, cardamom, areca nut, dry chilies and lemon.

2. ***Traditional Food Crops***

Traditional food crops consist of rice, maize, wheat, buckwheat, and others. Research in these areas has been conducted extensively and it has been proved that Bhutanese farmers can enhance production of these crops through improved seeds and technologies.

AGRICULTURAL MARKETING SYSTEM AND PRACTICE

The government with a view to promoting the agricultural marketing system established the Food Corporation of Bhutan (FCB) in 1974. The FCB was given the responsibility of ensuring a fair price for both the producers and consumers and the distribution of food and essential agricultural produce. In the mid-1980s the FCB outlets were leased out to the private sector for more efficient distribution of food and related items. FCB also withdrew from activities as direct buyer due to the losses it sustained in the 1980.

The FCB is still the main public sector concerned with agricultural marketing. Its responsibility ranges from procuring quota-food stuffs from India to the storage and distribution of World Food Program (WFP) food aids and the maintenance of a small buffer stock of food grains. The FCB operates three permanent auction yards and 12 temporary ones on seasonal basis. It provided a common trading place and ensures fair prices to framers. However, the credit system is poor for both the buyer and seller due to the difficulties in collecting payment.

Table 1. Major Cash Crops Auctioned through the FCB, January to December 1998

Commodity	Quantity (mt)	Value (Nu. 000)
Potato	18,193.60	147,201
Apple	972.75	7,113
Orange	3,657.40	15,879
Ginger	640.131	4,124
Dry chili	36.274	1,348
Rajma	38.798	736
Soybean	87.008	692
Areca nut	75.763	731
Cardamon	1,344.00	72

Source: MOA, Marketing Unit, Agriculture Report 1998.

The main agricultural products traded are oranges, apples, potatoes, ginger, cardamom, areca nut, dry chilies and lemon. It has been estimated that in Bhutan only about 12 percent of the vegetable produce is traded whereas cash crops such as apples, oranges and others are about 55 percent. According to the Ministry of Agriculture (MOA) reports, the domestic trading of food grains is dominated by imported products with only 3 percent of the total grains traded in-country. The average annual growth rate of the horticulture exports from 1992 to 1997 was 1.9 percent annually whereas during the same period the average annual import growth rate was 19 percent annually. There is an imbalance in the export-import of horticulture produce. The major trade imbalance has been created due to the large and extensive import of vegetable products (for the trends in main commodity import and export, refer to the Annexure).

Apart from the FCB auction markets along the border with India there is no internal wholesale markets where retailers can buy produce. The practice is that the traders buy directly from farmers at their farm or farmers may sell their produce at certain convenient places for instance as the bus depot, road-point places to the transporters, shipment of the goods directly to the buyer. The other market place and practice is the Sunday market in the 20 district administrative centers on weekly basis to facilitate marketing of produce.

The practice followed in horticulture marketing is the wholesale purchase of fruits during the flowering season. The trader visits the orchards during the flowering season and makes a deal with the orchard owner. As a surety an advance payment is made to the orchard owner. This practice of marketing is a gamble of the trader against the weather. If the weather is not favorable during the maturity period it is the trader's risk.

In many cases traders have often experienced heavy losses due to the practice of early purchase. In 1998, in Chirang district, about 75 percent of the oranges were damaged due to rainfall during the maturity season. In the year 1999 most apple traders in the Paro valley predicted they would incur losses due to damaged apple fruit caused by heavy rain and hailstone during the fruiting season of the apples in the month of May.

Table 2. Export of Major and Selected Commodities, 1994-97

(Unit: mt)

Commodity	1994	1995	1996	1997
Export of Major Commodities				
Potato	7,743	13,603	13,899	13,016
Orange	8,028	11,384	12,585	18,647
Apple	3,538	3,686	4,314	4,103
Export of Selected Commodities				
Ginger	858	715	1,567	1,151
Cardamon	1,411	1,233	977	528
Mushroom	0	6,192	1,125	1,162

Source: Division of Revenue and Customs, *Export Report 1998*.

1. ***Rural Credit System***

Since late 1970s the government with a view to enhancing production and marketing of agricultural goods, initiated the rural credit system to make finance available to the farmers. In 1978 the FCB was given the responsibility to ensure proper distribution of the loans. The loans were of three categories: short-term loans of 6 percent interest and repayable in one year; medium-term loans of 8 percent and repayable in three years; and long-term loans repayable in five years with 10 percent interest.

With the establishment of the financial institutions in the early 1980s, the Bhutan Development Finance Corporation (BDFC) assumed the responsibility of providing credit to the farmers under the rural credit system (*although BDFC provides credit for all the sectors of economy*). The rural credit funds are distributed through the 20 district administrative sectors. Throughout the 20 districts loan committees have been established with the authority to approve loan and recover loans from the farmers. The rural credit provided has been specifically targeted for the improvement of agricultural production. Credit is often provided in association with packages of improved technology. Seasonal loans also have been made available to the farmers. Out of the total credit disbursed, rural credit for agricultural purpose accounted for only 3.5 percent. It has been estimated that only 9-10 percent of farmers availed of loans.

2. ***Pricing***

Bhutan being a landlocked country, the pricing policies of agricultural products to a great extent are determined by factors such as difficulty in accessibility and poor transportation system, small size of population and the prevalent Indian market conditions. Further, lack of budgetary resources has made it impossible for the government to implement pricing policies which require substantial subsidies.

In the past the FCB set floor prices for agricultural produce. However, with heavy losses incurred in the 1980s the government discontinued the practice. Presently, the FCB only purchases small quantities of surplus produce on behalf of the WFP. With regard to fruit produce, the government through FCB sets the floor price prior to auction. The price policy permits the Bhutanese exporter to retain 30 percent of the total sale in hard currency and the rest in local currency. Government intervention in pricing policy is only for scarce food items.

GOVERNMENT AND PRIVATE SECTOR ROLES

The present government policy is not to intervene directly in marketing, but to solve supply constraints and make markets operate more efficiently through the involvement of the private sector. It has been stated that the government would intervene only when absolutely necessary and limit itself to a regulatory role.

In order to provide marketing support to the private sector, traders and farmers the government set up the Marketing Unit under the MOA. Its main task is to assess market feasibility of the produce in the South

Asian region and disseminate information on market trends and prices also to develop and enhance private sector marketing system and to ensure fair price to the farmers. It is also entrusted with the task of training of private sector personnel in the marketing of produce, information gathering and market feasibility study.

The private sector through the Bhutan Chamber of Commerce and Industry (BCCI) plays a crucial role in the marketing of agricultural products. The BCCI in collaboration with the Ministry of Trade and Industry and the MOA is involved in the setting of floor prices, search for alternative markets and the creation of awareness among traders and farmers about the prevalent market situation. It is also involved in the training and coordination of private sector and training of marketing personnel in the agriculture sector.

CONSTRAINTS IN AGRICULTURAL MARKETING

1. ***Communication***

Bhutan being a mountainous country, the topographical conditions are a major constrain in the development of an efficient agricultural marketing system. The motor road construction began only in 1959. Presently a total road network of 2,674 km connecting all the 20 administrative districts exists. The government policy in the previous Five-Year Plan (7th FYP 1992-96) was to construct and maintain the national highways and bridges so that all the substantial population centers were connected. The present policy is to maintain all the existing road networks without construction of additional roads. For the majority of the population, however, access is only by mule track or foot trail. The lack of developed transportation system has led to the segmentation of the markets into various regions. The transportation constraint most often is the determining factor in the pricing and distribution of produce. It also creates bottlenecks in the distribution system and instability in the market prices particularly for perishable produce.

2. ***Rural Credit System***

The availability and access to agricultural credit, rather than the interest rates are the operative constraints which farmers face. With agricultural loan interest rates at 15 percent per annum and inflation rate about the same, real interest rate is negative and it fails to encourage mobilization of savings. The other credit constraint is the bureaucratic procedure in availing the credit. Although the loans are targeted for agricultural production, it has been proven that due to lengthy bureaucratic procedures a prospective credit applicant often withdraws from availing the credit.

3. ***Open Market System***

Although Bhutanese agricultural products are of high quality, the open market system shared with the neighboring Indian market is both an opportunity as well a constraint for competition among the Bhutanese farmers. Given the landlocked topography and the associated difficulties, the Bhutanese farmers are often at a disadvantage in competing with the cheaper and bulkier production across the border. This often discourages the Bhutanese farmers in venturing into large-scale cash crop farming.

4. ***Human Resource***

Modern education system in Bhutan started only from the 1960s. The country presently enjoys one of the best educational systems, has been a latecomer into the modern development arena with a population of little more than 600,000. There is shortage in both skilled and unskilled manpower. This is one of the major constraints in developing a proper network and distribution of skilled extension workers in the field. It is also a major stumbling block to initiate any development activities related to agricultural marketing systems and practices.

5. ***Export and Auction Problems***

Selling of goods through auction is one of the major marketing practices. The constraints faced are pre-harvest advance payment by the traders to the farmers and the direct sale to the traders by the farmers, which hampers the auction price. The export constraints are that the rate is fully dominated by the importers with least importance being given to the initial agreement signed and the under invoicing.

Other marketing problems include issues of packaging, sorting and handling of the produce. It has often been reported that due to poor packaging, sorting and grading and handling the produce is damaged and rejected in the market. This is also the case for Bhutanese agricultural products not been well received in the neighboring markets of India and Bangladesh.

ROLE OF THE EXTENSION WORKERS: THE BHUTANESE PRACTICE

In Bhutan, the Marketing Unit under the MOA performs the role of marketing extension. Its functions are as stated in the preceding chapter. The MOA has about 50-55 agricultural extension workers in the various *gewogs*.* Through these *gewogs* agricultural workers the Marketing Unit disseminate training and information with regard to agricultural marketing to the farmers and traders. Apart from these functions the Marketing Unit conducts market study and feasibility on yearly basis for all the agricultural products traded in Bhutan.

Trends and Opportunities for Agricultural Extension Workers

Over the past few years there has been steady growth in the population as well as in agricultural production. From the export and import trends in agricultural produce between 1992-97 it is evident that there has been an annual growth of 1.9 percent per annum in export whereas import growth rate has been 19 percent annually. The major imbalance of trade has been due to the extensive import of vegetables and fruit for agro-industries, which are produced in small quantities in Bhutan. The agricultural farming practiced by the Bhutanese farmers is basically for self-consumption. Only few practice vegetable farming for cash income generation. The rationale often has been the long-standing traditional farming practice of self-consumption and the lack of awareness of the market income generation capabilities. Given the harsh topographical landscapes and difficulties in accessibility, agricultural marketing and agricultural extension workers have a crucial role to play.

In the Bhutanese context the extension workers' priority would be to encourage more cash crop farming practices, especially for vegetables. From the studies undertaken by the MOA farmers possess the capabilities in vegetable farming but lack the marketing know how. Marketing extension services is the key point in enabling more farmers to practice cash crop farming.

In any case, the present practice of marketing system in the country is still far behind the global trend of providing value for money and an efficient service. Simple practices such as grading of products, sorting and handling of the agricultural products need skilled and trained manpower, which is in short supply.

* Four or five villages grouped together form a *gewog*. It is similar to a county system in other countries.

Annexure

Main Commodities and Trends in Horticulture Trade

A. Exports

		Unit	Average 1992-94	Average 1995-97	Annual Growth (percent)
Apples	Total volume	mt	3,341	4,034	+6.5
	Total value	US$ 000	1,482	1,991	+10.3
To Bangladesh	Volume	mt	2,900	3,013	+1.3
	Value	US$ 000	1,391	1,498	+2.5
To India	Volume	mt	438	1,021	+32.6
	Value	US$ 000	89	493	+76.8
Oranges	Total volume	mt	14,542	14,205	-0.8
	Total value	US$ 000	4,933	3,923	-7.4
To Bangladesh	Volume	mt	12,936	10,604	-6.4
	Value	US$ 000	4,627	3,147	-12.1
To India	Volume	mt	1,606	3,601	+30.9
	Value	US$ 000	306	777	+36.4
Potatoes	Total volume	mt	8,948	13,506	+14.7
	Total value	US$ 000	940	1,685	+21.5
Cardamon	Total volume	mt	1,181	913	-8.2
	Total value	US$ 000	2,024	1,748	-4.8
Mushroom	Total volume	mt	0.83	9.69	+127
	Total value	US$ 000	13.1	263	+172
To Japan	Volume	mt	0.98	6.0	+106
	Value	US$ 000	11	199	+163
All Vegetables	Total volume	mt	496	1,482	+44
	Total value	US$ 000	83	224	+39
Ginger	Total volume	mt	657	1,144	+20
	Total value	US$ 000	135	190	+12
Lemon Grass Oil	Total value	US$ 000	0	181	-
Dried Chili	Total volume	mt	71	29	-26
Lemon/Lime	Total value	US$ 000	17	8	-22
Medicinal Plants	Total value	US$ 000	0	63[a]	-
Asparagus	Total value	US$ 000	0	2	-
Horticulture Exports Total Value (US$ 000)					
All Fruits			6,433	5,928	-2.7
Potatoes			940	1,685	+21.5
All Spices			2,187	1,966	-3.5
All Vegetables			149	485	+48.1
Other horticulture products			20	221	+124.5
Sub-total			9,729	10,285	+1.9

B. Imports

		Unit	Average 1992-94	Average 1995-97	Annual Growth (percent)
Pineapples	Total volume	mt	336	449	+1.0
	Total value	US$ 000	21	27	+9
Mangoes	Total volume	mt	247	144	-16
	Total value	US$ 000	28	23	-6
Grapes	Total volume	mt	32	2	-60
	Total value	US$ 000	4.2	0.7	-46
Other fruit	Total volume	mt	30	155	
	Total value	US$ 000	11	21	
Saffron	Total volume	mt	2[b]	4.1	
	Total value	US$ 000	23[b]	41	
Other spices	Total volume	mt	36	34	-2
	Total value	US$ 000	37	39	+2
All vegetables	Total volume	mt	3,141	4,632	+14
	Total value	US$ 000	484	676	+12
Total horticulture imports	Total value	US$ 000	527	892	+19
Total horticulture trade balance	Total value	US$ 000	9,202	9,393	+0.6

Source: Bhutan Trade Statistics 1992, 1993, 1994, 1995, 1996 and 1997, Revenue and Customs Division, Ministry of Finance.

Notes: [a] 1997; and [b] 1994.

17. CAMBODIA

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INTRODUCTION

Cambodia is a small country of 11.4 million inhabitants drained by three main river systems: the Mekong, the Tonle Sap and the Basac. About 86 percent of the country lies within the catchment area of the Mekong. The total area is reported to be 181,035 km^2, divided into 24 provinces and municipalities. The total cultivated area is 2,158,000 ha, predominantly devoted to rice cultivation. Rice is the most important crop, contributing a third of the total value of agricultural production while occupying 90 percent of the cultivated land. Its production was about 4,041,000 mt in 2000. Before 1970 rice exports were 500,000 mt to one million mt. The rice yield has varied from 1 to 3.5 mt/ha.

The second crop is rubber. In 2000 42.4 mt were produced from 47.8 ha. In addition to these crops, subsidiary crops such as corn, bean, sesame, black pepper, tobacco, cotton, jute, chili, peanut, banana, coffee are also cultivated.

Animal production in Cambodia has been mainly for draft purpose as well as domestic consumption while cattle rearing has been important from draft point of view. The production of pigs, poultry is just for domestic consumption. Lack of forage causes problems in dry season. There has not been any national or international corporation for these two kinds of animals in Cambodia.

Agricultural Policy

Cambodia's agricultural policy is to increase crop productivity, ensure optimum return to land and add value to farm produce through agro-processing. Agricultural area is rapidly expanding and it is likely that in the near future Cambodia will become a major agricultural exporter. With crop area expansion, forest destruction and utilization of natural resource, there is the possibility of overexploitation of natural resources leading to their degradation.

The Royal Government has recognized these problems and provided a policy for agricultural and natural resource management. The Ministry of Agriculture Forestry and Fisheries (MAFF) formulates policies for increasing forest crops and research development.

The MAFF encourages farmers to adopt appropriate technology and cropping system, such as multiple-cropping and agro-forestry. Increasing crop area depends on removing land mines, where the government is collaborating with the international community. Increasing yields depends, apart from water control, on (timely availability of) inputs, particularly fertilizers, to farmers.

The government's development strategy focuses on reduction of poverty through sustainable employment generation, with the agriculture sector's basic goals being to:

1. improve food security through expansion in the production of rice and other food crops.
2. contribute to economic growth and to foreign exchange earning through exports.
3. improve income opportunities for farm households by crop diversification, particularly those headed by women.
4. promote value addition to crop and livestock production by development of agro-processing industries.

Research and Development

The Cambodian Agriculture and Research Development Institute (CARDI) and the Department of Agronomy and Land Improvement conducted field demonstration on plots for showing easy-to-adopt new technologies to the farmers. They also conducted on-farm adaptive trials.

Extension and Training

More than 500 extension workers have been trained to work all over the country. This number is very small compared to the number of farm families.

Now, AusAid has funded 13 provinces under the extension program. The Department of Agricultural Extension (DAE) focuses on appropriate agricultural technology dissemination. At present human resource development has priority.

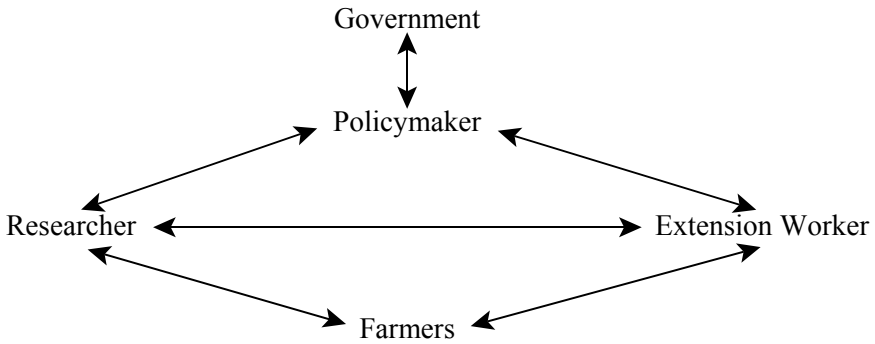

Figure 1. Network of Extension Service

Extension Services at National and Local Levels

There are some tasks that could be mentioned:

* Taking research result to the farmers
* Helping farmers' share experiences
* Helping them earn more money and have a better standard of living.

To promote and support the country's agricultural policy:

* Help build up farmers' confidence in their ability to increase production
* Help farmers to reach sound decisions and solve their own problem
* Recommend to the decision-makers policies that will benefit farmers
* Help farmers gain access to new resources
* Provide adequate farm management technical service for farmers, for industry and government.

Rural Credit System

The government's new economic policy introduced in 1990 changed the socialist economy to a market economy. The majority of farmers have opted to leave the *Krom Samaki* system to be free to farm their land as they wish, whether as owner-occupiers or with use rights transmissible to their children. Yet the lack of capital and the complete absence of agricultural credit is keenly felt when it comes to buying specific inputs needed for certain crops or draft animals.

Credit sources are few. There is a great deal of lending within kin group/close relatives, both at zero and at "market rates of interest". Moneylenders and merchants are an important source of credit as well, while NGO or institutional credit remains undeveloped. Every place appears to have some access to NGO for bank credit, but the amounts involved are small and interest charged at 4-5 percent a month is not cheap.

Therefore, traditional moneylenders still plays a significant role as a source of agricultural credit. The private moneylenders often charge exorbitant interest rates.

Marketing

It is not only extension that is needed to improve agricultural production. Marketing extension services are of equal importance. The market information system/service (MIS) has been set up to provide price information to farmers as well as traders. However, a market extension service is necessary to help farmers deal with marketing their produce.

In practice, the marketing extension officer will play the role of farmers' business advisor. Farmers who wish to take advantage of strategies and production plans can discuss their problems with these advisors. Finding out the requirements and preferences of the consumers will be a key strategy to successful marketing. Cambodia has not yet had such a service. Therefore it is reasonable to expect that the market extension system established to assist farmers in marketing should work together with agricultural extension services.

Rice prices show a seasonal fluctuation pattern, decreasing during the main harvest season (November-January) and increasing during off-season (flood season) although the range and pattern of fluctuation varies every year. Paddy rice and rice price fluctuates in parallel in each production area.

To improve the marketing efficiency in spatial distribution and pricing there is need to:

- strengthen MIS;
- eliminate informal costs;
- rehabilitate trunk roads and core distribution facilities;
- create an open-index-price establishing the paddy collection markets; and
- introduce quality standards and inspection services.

Present Constraints of Agriculture

To address research and extension problems, a new Department of Technique Economic and Extension was established in 1995. The government is exploring the possibility of international support to further strengthen its research and extension capability.

In addition, land tenure will be strengthened by accelerating the program of issuing land title certificates. The MAFF will promote to sustainable management of land and water. Since 1997, steady increase in both cultivated area and paddy production has been noted. In 1979 only 770,000 ha of rice area was reported. Production of most non-rice food crops has slightly declined in recent years and the country imports nearly one quarter of domestic demand of vegetables. Between 1985 and 1994, the number of pigs estimated have increased by 67 percent, poultry by 56 percent, cows by 68 percent and fish by 32 percent. This is much higher than the population increase of around 30 percent during this period.

Major Issues/Problems Affecting the Delivery of Agricultural Support Services

Although Cambodia is an agricultural country, its agricultural development is constrained by:

- lack of infrastructure
- inadequate means of communication
- lack of modern means of transport (traditional transport means include cows carts, horse carts)
- lack of farmer knowledge and poor living conditions
- lack of qualified extension workers and trainers
- lack of technical officers
- poorly equipped research facilities
- lack of extension material
- weak or non-existent cooperative system.

Infrastructure in Cambodia is very poor. Some provinces still remain isolated. Roads, which link these provinces to the city or business towns, are in a bad state. On the other hand, Cambodia does not have adequate transport facilities to use for agribusiness. So distribution of agricultural products is really very weak. Many farmers have to sell their produce in the local markets at very low prices. This acts as a disincentive to producers to increase production.

Present Condition and Problems Concerning Farmers' Organization

Nearly all of Cambodian farmers work individually and they do not form any farmers' organization. But traditionally, they always help each other by sharing labor.

Some international and non-government organizations have tried to organize farmers' clubs in some areas in order to support farm families with credit.

Problem of Rural Areas

Nearly all of Cambodian farmers still use traditional methods to produce their crops. They do their farming based on rainfall. They do not have adequate irrigation systems. Many farmers have tried to use chemical fertilizer but most of them do not know how to use it.

Many farmers do not use pesticide properly or correctly.

* Nearly 95 percent of Cambodian farmers still use traditional tools and equipment for their farming.
* Sanitation in rural areas is very bad. Farmers do not have clean water to use and drink. Health problems mainly affect women, children and old people. Children usually suffer from diarrhea. Farmers do not drink boiled water. Health care facilities do not exist at the commune and village levels.

For addressing these problems the NGOs and government agencies/institutions need to build the capacity of the human resources, especially technical specialists and extension officers for strengthening agricultural support services for small farmers.

Linking Extension, Research and Farmers

At the present stage of development of agricultural research and extension services linkages between stakeholders are very weak and there are few effective mechanisms in place to foster these links. While some informal links do exist on the basis of discussions at various meetings and field days and through related aid projects, these are unplanned, unstructured and conducted entirely on an *ad-hoc* basis.

Adaptive on-farm research programs have a vital role in technology transfer, in particular in defining the problems of the small farmer, in improving feedback to research, and in making recommendations appropriate for specific agro-ecological and socioeconomic conditions.

Successful adaptive research requires that strong links exist between extension, research and farmers. It requires that farmers, extension and research staff all recognize that they are clients of each other and stakeholders in the same process. Farmers need the new technologies to help them to increase productivity and food security. Extension workers need new technologies to promote to the farming community to help the farmers to achieve these goals. Researchers need to be doing relevant research to justify resources invested in them.

Role of NGOs and Private Sector in Providing Agricultural Support Services to Small Farmers

NGOs and private sector are linked to relevant government agencies/institutions such as research, agricultural extension service for provision of credit, inputs and capacity building.

1. ***Private Input Supplies***

* Thai CP group produce corn for animal feed (HIGRO) and raise chickens for meat and eggs.
* British American Tobacco provide tobacco seed as credit and technical knowledge to the farmers.
* Weestop sell pesticide to the farmers at low price.
* The Royal group conduct artificial insemination on cattle.
* Phosphat Touk Meas Company produces chemical fertilizer and sells to farmers at low cost.
* Federation for Advanced Agriculture Development of Cambodia produces rice for selling to farmers.
* Agriculture Quality Improvement Project (AQIP) Company produces new varieties of seed and sells them to farmers.

2. ***NGOs***

* Cambodia Australia Agriculture Extension Project working closely with the DAE in 13 provinces.
* CARDI supported by AusAid working closely with the Department of Agronomy and Soil Improvement conducting rice research.

* CIDSE linked to the Department of Agronomy and Soil Improvement conducting training relevant to agriculture and credit.
* Agricultural Production Improvement Project (APIP) linked to the Department of Agronomy and Soil Improvement, Department of Animal Husbandry, Department of Fishery and Department of Human Resource Development. APIP supplies financial resources for capacity building to that department.
* FAO linked to the Department of Agronomy and Soil Improvement and other departments that relate to agriculture.
* LWS linked to the Department of Animal Husbandry
* CWS linked to the Department of Agronomy and Soil Improvement conducting farming systems extension and providing credit to farmers.
* World Vison linked to the Department of Agronomy and Soil Improvement. World Vison organize farmers' clubs and provide money to farmers to buy piglets, cow and chickens and also provide credit to farmers.
* ACELIDA provide credit to the farmers.
* JVC provide credit to the farmers and also undertake capacity building.
* Japan International Cooperation Agency (JICA) linked to the Department of Agronomy and Soil Improvement and other departments is involved in sale of pesticide to the farmers.
* GTZ provide credit and capacity building for farmers.
* CRS conduct farming system training and capacity building.

To improve the delivery of agricultural support services in Combodia there is an urgent need to:

* develop human resources.
* provide loans to farmers at low interest rates.
* supply agricultural inputs to farmers.
* find suitable markets for farmers.
* involve NGOs and other stakeholder in the support to farmers.
* increase the number of extension workers.
* organize farmers' clubs/farmers' associations.
* establish agricultural cooperatives.

History of Officially Established Agricultural Cooperatives and Their Activities

1. ***The Royal Office of Cooperatives (ROC)***

In the early 1960s, in attempting to develop agriculture the Cambodia Government promoted agricultural cooperatives for rural credit and marketing. In the traditional system, farmers relied on a village trader who was usually either Chinese or Sino-Khmer. The trader lent the farmer all the necessary agricultural inputs and general items and was rapid at harvest with a portion of the crop immediately at harvest time, and consequently at low prices, because the farmer lacked storage facilities.

The trader, however, was able to store his share so that the system worked largely to the trader's advantage. In addition to trading profit, the farmer was charged interest on his loans of up to 10 percent per month. The attempt to dismantle this system by encouraging villagers to form their own cooperatives which could afford their own storage facilities was made, in 1956 when the government established the ROC with the following objectives:

– Assist cooperative associations by supplying them with funds to grant loans to their members.
– Sell agricultural produce
– Develop handicrafts
– Set up experimental stations for producing and distributing improved seeds
– Rear selected cattle, pig and poultry
– Set up general stores in remote regions to supply farmers with input needed and to market their products at fair prices.

From the technical view point, ROC assisted the production cooperatives in the education of their members in the use of improved implements and chemical fertilizers and in the preparation of manure and composts. They supplied the farmers with the equipments and manufactured goods required by them.

The first cooperative was set up in 1956. In June, 1966 the situation of the cooperative movement was as follows:

- 512 working cooperatives had been set up; 121 were in process of affiliation. They are located in 13 provinces. Credit cooperatives were granting loans and financing long- or short-term investment of their members
- 390 multipurpose agricultural cooperatives with 121 applicants pending
- 55 consumer cooperatives
- 14 specialized production cooperatives
- 40 school cooperatives and 10 in process of affiliation.

To these cooperatives were added: 20 sales rooms and nine popular stores. In Battambang, Takeo and Prey Veng the cooperatives were federated into a union. The geographical distribution is shown below. Most of them were established in the most fertile, populated and richest provinces of the country.

Battambang	21.9 percent
Kandal	13.8 percent
Kompong Cham	8.4 percent
Takeo	8.0 percent

The total membership amounted to 323,000 members. The total capital exceeded 41 million riels (over US$1 million) and their reserves amounted to 30 millions riels.

In 1956 the cooperative handled 15 percent of the rice exported, all the cotton produced and approximately 50 percent of the agricultural products delivered to Cambodian industry. The results were spectacular. In 1967, the ROC took steps to lower the prices of fertilizer. It sponsored the establishment of phosphate plant of 12,000 mt capacity per year and urea plant in Sihanouk Ville.

The cooperative organization in Cambodia had bright prospects and became the main factor of progress in Cambodian agriculture.

During the period 1970-75, the cooperative sector faced enormous difficulties and most of the cooperatives were closed due to political instability and other factors related to inadequate membership support, weak and/or corrupt management, poor, sometimes dishonest supervision, insufficient capitalization and political interference.

***Krom Samaki* (Solidarity Production Team)**

In the early 1980s the government encouraged the organization of agricultural communities into Krom Samaki Solidarity Units to develop rural communities along the socialist model. At that time the Solidarity Production Team was considered as a primary agricultural cooperative. The *Krom Samaki* were kept small (15-20 families, 1.4 ha per family). Members of the groups were given the right to use, but not own land. Most of the Krom Samaki were solely rice growing, but in some regions they utilized the land to grow rubber or jute or to raise cattle or fish.

In the period immediately following the disruptive years of 1979-81, the *Krom Samaki* Team was successful in providing many families with support to restore their farms. The type of *Krom Samaki*, i.e., the degree of collectivization, adapted by the community was determined largely by the characteristics of local condition and constraints rather than by enforcement from above.

There are three types of Krom Samaki. Type one includes larger collectives approaching the State farm category, introduced in limited areas where a more sophisticated mechanized form of agriculture was being practiced, usually in connection with the production of export commodities (e.g., parts of Battambang and Takeo provinces). Most *Krom Samaki* were, in fact, not far from the traditional form of village cooperation common in earlier years (Type two). Type three (small-scale family cultivation, or *Krom Krousar*, family groups) refers to food production along the fertile riverbanks. In fact, only type one represented a genuine form of collective farming.

In 1989, collectivization was formally abandoned as State policy in favor of essentially private production, although 'mutual assistance' or traditional sharing of agricultural labor continues to be

emphasized and practiced. In 1989, *Krom Samaki* existed only as convenient units of organization, for the purpose of taxation, dissemination of government policy, health and literacy campaigns, etc.

MAJOR PROBLEMS IN COOPERATIVE ORGANIZATION AND MANAGEMENT

- Lack of understanding about cooperatives
- Lack of cooperative coordinator
- Lack of interest in cooperative movement by the leadership due to inadequate awareness of importance of cooperatives for rural community
- Corruption, self-serving attitude
- Autocracy, personalized system
- Lack of cooperative management skills
- Poverty, illiteracy of farmers.

CONCLUSION

Although there is a complete absence of cooperatives in Cambodia, there is a belief that cooperatives can play a vital role in utilizing local resources and producing for domestic consumption as well as for export. Cooperatives are an important institution for enabling farmers to add value to their farm produce.

It is now the time for the Cambodian Government to thoroughly revise its policies towards the peasantry. The government should support the reestablishment of the agricultural cooperative system in the near future. The cooperative sector, although non-existent at present, will offer an alternate route for development in the face of governmental financial constrain. The cooperative sector appears to have been forgotten but provides a promising option to governmental development interventions.

The MAFF has not yet initiated much action with respect to the cooperative sector.

Appendix I

Crop Production in Cambodia, 2000

No.	Crop	Area (ha)	Production (mt)	Yield (kg/ha)
1.	Rice	2,158	4,041	1,872.6
2.	Corn	60	95	1,583.3
3.	Cassava	14	228.5	16,321.4
4.	Sweet potato	9.34	32.5	3,479.7
5.	Mung bean	26.8	15.9	593.3
6.	Peanut	10.6	9.2	867.9
7.	Soybean	35.1	35.1	1,000.0
8.	Sesame	16.4	7.4	451.2
9.	Sugarcane	8.4	160	19,047.6
10.	Jute	0.3	0.3	1,000.0
11.	Tobacco	8.3	6.4	771.1
12.	Cotton	1	7	7,000.0
13.	Rubber	47.8	42.4	887.0
14.	Black pepper	0.5	0.75	1,500.0

Natural Resources of Agriculture, 2000

No.	Description	Area (ha)
1.	Forestry	13,227,100
2.	Season crop	300,000
3.	Fruit tree	80,000
4.	Pasture land	500,000
5.	Lake and river	120,000
6.	Seacoast (km)	100

Livestock Resources, 2000

No.	Description	Unit	Quantity
1.	Cattle and buffalo	Head	3,686,271
2.	Pigs	Head	1,933,930
3.	Poultry	Head	15,249,201
4.	Crocodile	Head	26,300
5.	Shrimp	mt	20
6.	Freshwater fish	mt	196,856
7.	Sea fish	mt	36
8.	Aquaculture	mt	14,410
9.	Fingerling	Head	7,508

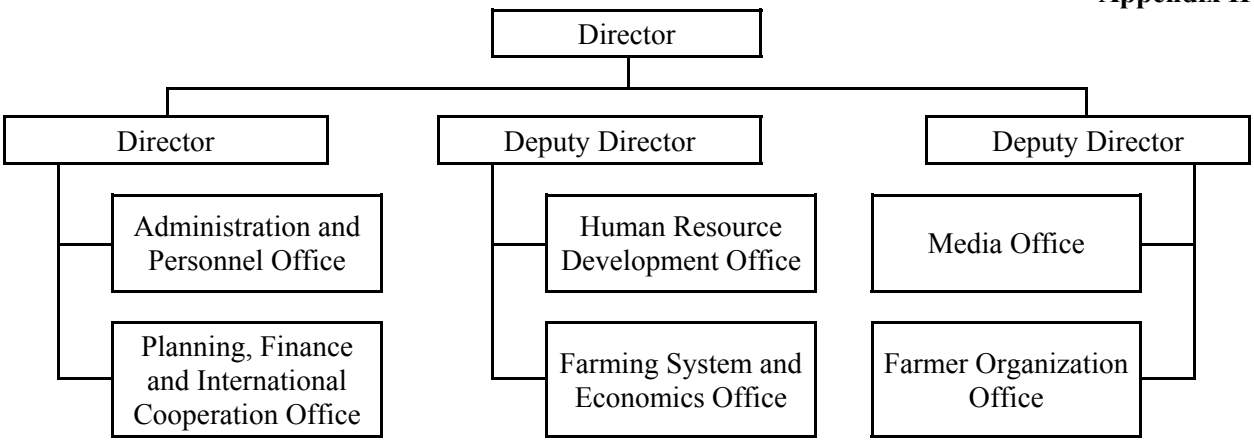

Figure 1. Department of Agricultural Extension Organization Chart

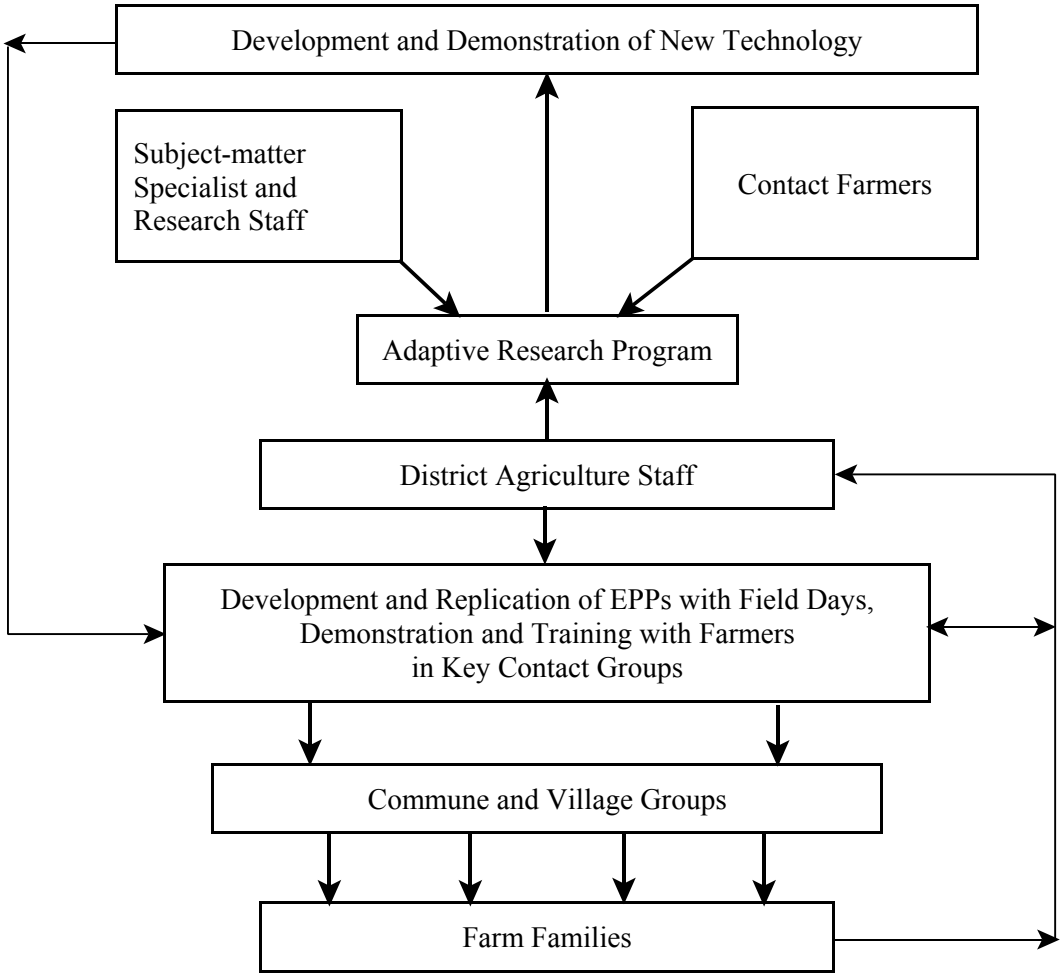

Figure 2. Schematic Representation of the Technology Transfer Role of the District Agriculture Staff

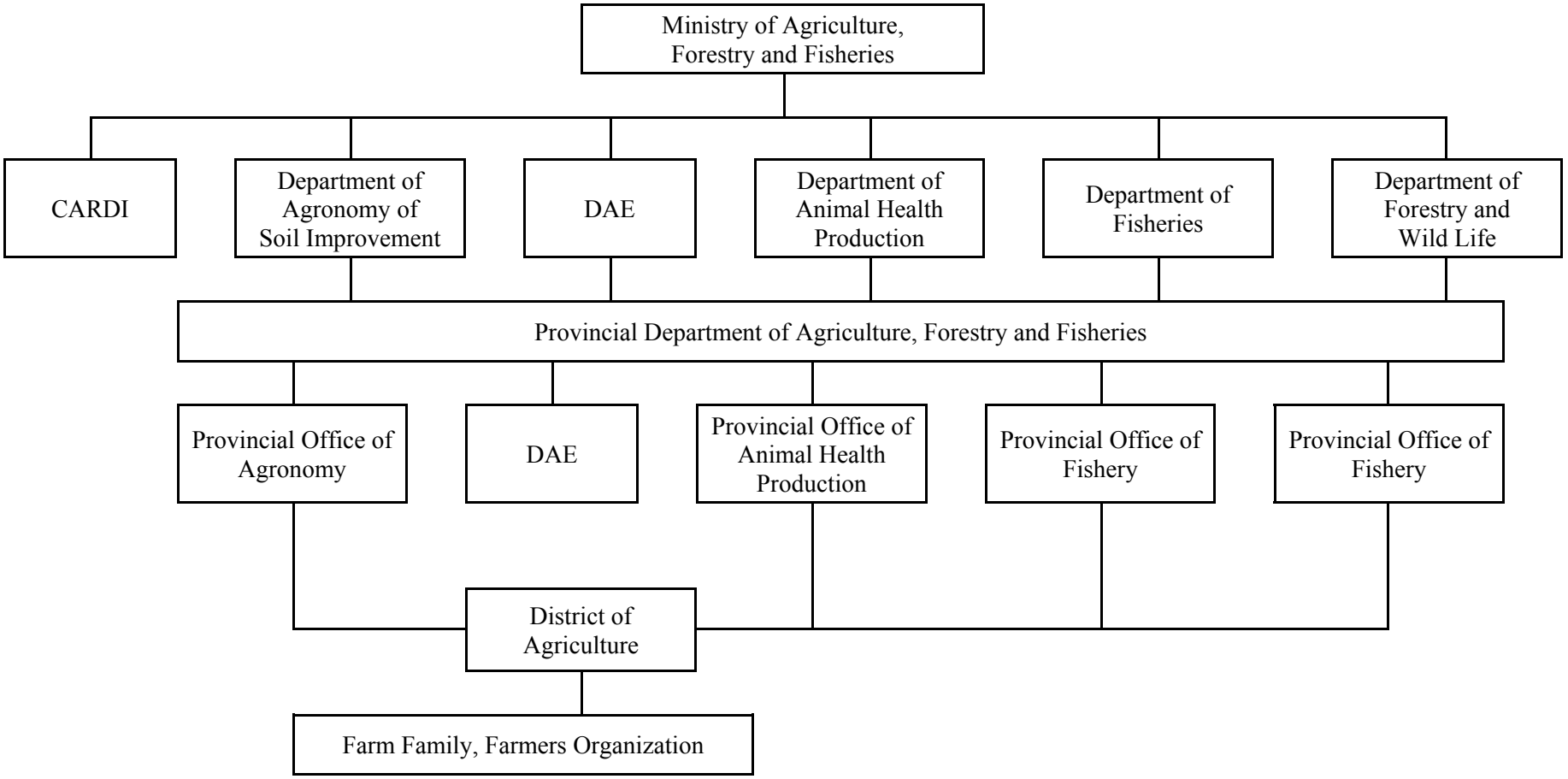

Figure 3. Organizational Chart of MAFF

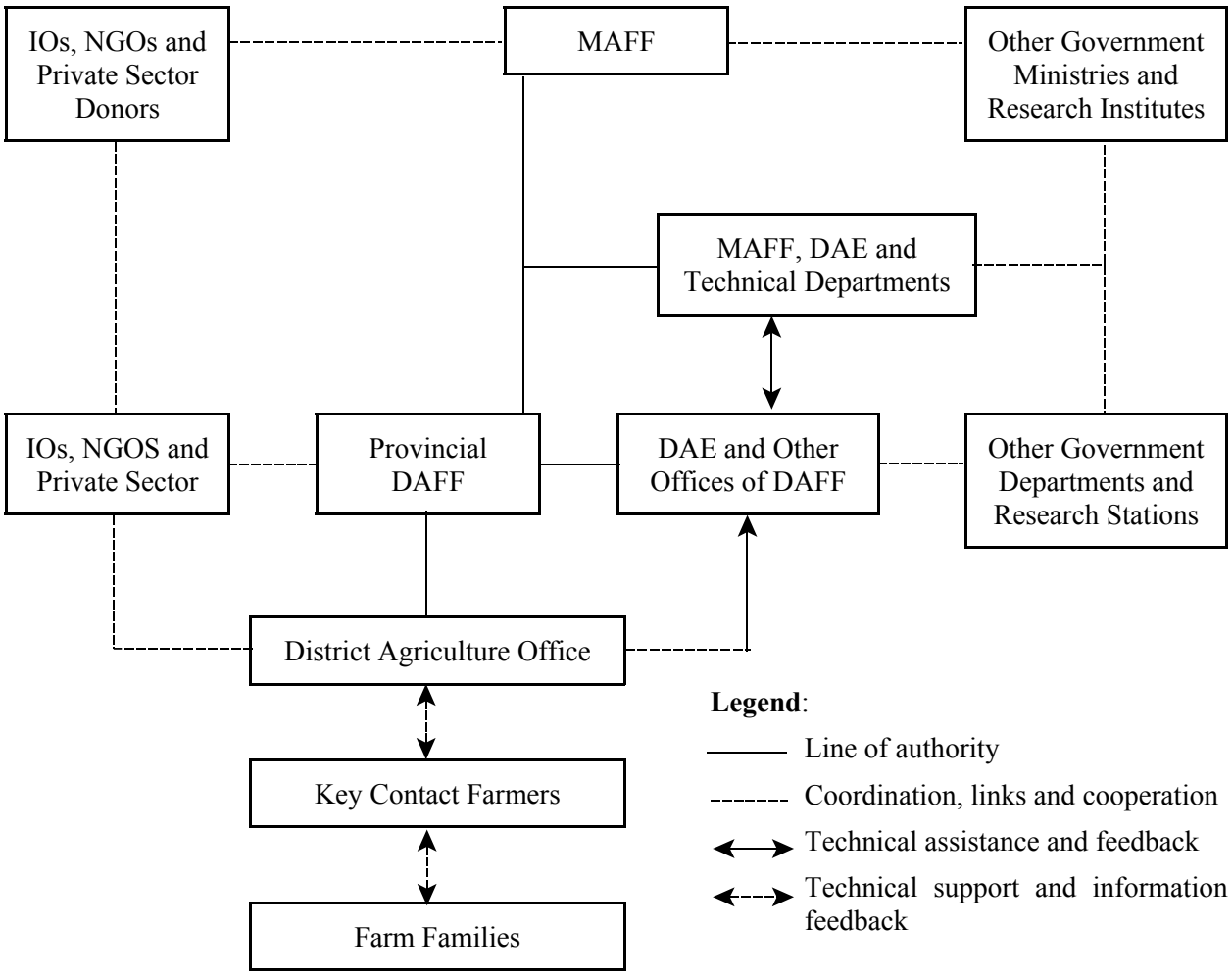

Figure 4. Organization and Function Relationships of Agricultural Extension

18. MALDIVES

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Malé

INTRODUCTION

The Republic of Maldives consists of 1,190 coral islands, which form a chain; 820 km in length, 130 km at its widest point, set in an area of 1,000,000 km^2 of the Indian Ocean. Only 197 of these islands are inhabited. India and Sri Lanka are the country's neighbors lying some 600 km and 750 km north and northeast of the Maldives, respectively. The islands form 26 natural atolls, which, for purposes of administration, are grouped into 20 units. Most of the islands are small, few with a land area in excess of 1 km^2. They are low-lying, with an average elevation of 1.6 m above mean sea level. The country extends from equator to latitude 8º north. It has tropical climate, which is warm and humid, with two pronounced monsoon seasons. Daily temperatures change very little throughout the year. The annual mean temperature is 28ºC, with a maximum average of 32ºC and a minimum of 25ºC. Relative humidity ranges from 73 to 85 percent. Annual average rainfall in the period 1995-2000 was 1,870.3 mm. Monthly variations in rainfall are significant, ranging from 12.3 mm in February to 250 mm in May. While there are occasional gales (on average 12 days a year) and tropical thunderstorms (23 days a year), Maldives falls outside the main areas of tropical cyclones.

Population Dynamics

The population of Maldives is estimated at about 270,000 in 2000. This population is scattered over 197 inhabited islands. The remainder of the country's islands are uninhabited. More than 70 of these islands have been developed as tourist resorts. Ninety percent of inhabited islands have a population of less than 1,000 and only four islands have more than 4,000 people. Around 26 percent of the nation's population is living in Malé, the capital island. The population of Malé has almost doubled in the past decade, and is currently growing at around 5 percent per annum. Nearly 75,000 people live in the capital island of which nearly two-thirds are migrants from the outer islands who have settled here in search of a better life. Maldives population is young, with 45 percent under 15 years of age, and 17 percent under the age of five. Population growth rate is high. It averaged 3.2 percent in the period 1977-85, but edged up to 3.4 percent in the period 1985-90, and has declined to about 2 percent in the period 1995-2000.

Economy

GDP of Maldives may have supported a relatively robust per capita income and development (GDP 1999, at 1995 constant prices is US$504.2 million and per capita GDP is US$1,910) but it is neither broad-based nor consistently rising. Tourism and fisheries are the major sectors of the Maldives economy. The GDP contribution from tourism sector has been consistent at more than 30 percent, while contribution from the fisheries sectors has been declining (7.8 percent in 1995 to 6.5 percent in 1999). The country has limited potential for agriculture as only 10 percent of the land is suitable for farming. Agriculture, however, plays a vital role in the livelihood of the rural population.

STATUS OF AGRICULTURE SECTOR

Agriculture in the Economy

Agriculture's share of GDP declined by 8 percentage points from 3.6 percent in 1995 to 2.8 percent in 1999. This decline reflects significant growth in other sectors. Agriculture's importance to the economy

is greater than its contribution to GDP, considering its impact on generating employment and income opportunities, especially for the rural population. The sector also contributes to attaining food security and greater self-reliance in part through import substitution of certain agricultural products. Approximately two-thirds of the population resides in the rural areas, and besides fishery, home-garden agriculture forms an important component of income for this population. To further strengthen the contribution of agriculture in the Maldives economy, the overarching objective of the agricultural sector for the next decade is to advance policy and institutional reforms which have already been initiated in order to increase agricultural incomes. This also involves increasing the linkages between the fisheries and tourism industries as well as the other sectors.

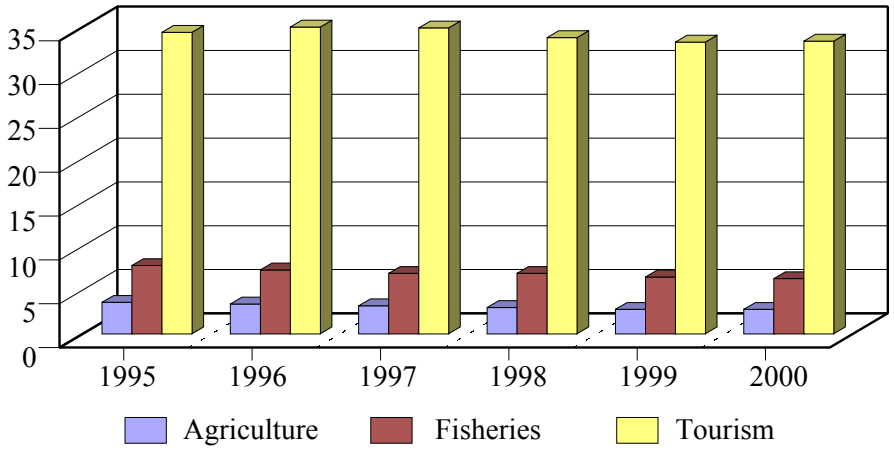

Figure 1. GDP Contribution by Sector

Source: Ministry of Planning and National Development.

Land Use and Farming Systems

Cultivable land, 10 percent of the total land area, is concentrated more in the outer atolls. A wide range of crops is grown in the Maldives, with greater concentration on root crops in Southern islands and field and grain crops in the North. Coconut is the most common 'plantation' crop in all the atolls as well as the most popular home garden tree. Coconut is an integral part of the Maldivian diet and its supply is sufficient for local use. Apart from being a major item for preparing foods and drinks, it is also a source of oil, thatch-mats and fuels. The production of fruits (banana, papaya, watermelon, etc.) and vegetables (chili, pumpkin, eggplant and leaf cabbage, etc.) has been increasing and they constitute a significant percentage of the grower's income. The production of root crops such as taro, cassava and sweet potato and grains is decreasing with increased consumption of imported rice and wheat flour at administered prices. Root crops and breadfruit are the only traditional staple crops that are locally produced. Livestock production is limited to goat husbandry and poultry production of which the latter is extensively farmed in majority of the rural islands. At present primary production methods fall under two broad categories:

1. ***Home-based Farming (Primarily Own Consumption and Crop Cultivation at Semi-commercial Level***

Most crops needed for domestic consumption are grown in the mixed home garden, which is a year-round process. Exclusively, women look after these gardens. The home gardens have many species growing in profusion, often overcrowded and far less than their potential yield. In most instances large trees are grown for shade, shelter, fuel wood and as timber. Excess produce from home gardens such as banana, papaya mango, breadfruit, betel leaf, citrus reach the markets when crops are in season. Apart from the backyard gardens, in inhabited islands, farmers have access to large tracts of land for crop cultivation. The total agricultural outputs from combined tracts/plots in these islands are significant and form the bulk of the marketable produce. However, influx of cheaper imports from neighboring countries makes harvest from such community-based farm uneconomical.

2. ***Crop Production at Commercial Level in Uninhabited Islands Leased for Long-term Development***

The government has leased out 30 uninhabited islands under the Long-term Island Leased Program (LILP) for development of commercially viable agriculture and fisheries as well as investing in economic infrastructure development. This contributed to diversification of agricultural production from traditional farming systems to commercially-based operations. Private sector initiatives with appropriate investments have assisted in identification of commercially competitive crops that could be grown within the country. Markets predominantly from tourism sector amplified production of such crops. Recently, there has also been an increasing trend in farming in the resorts islands. There is tremendous scope for agricultural development when linked with the tourism sector. A total of 26 resorts have been identified for producing a part of their vegetable and fruit requirements. In addition, timber forest management through traditional tenure agreements is an important component of agriculture. Uninhabited islands (leased under traditional tenure agreements), with few *ad hoc* crops grown by the lessees form the main reserve for timber. Majority of the uninhabited islands in the country fall in this category and the government has plans to utilize them more efficiently.

Agricultural Support Services

The Agriculture Section of the Ministry of Fisheries, Agriculture and Marine Resources (MoFAMR) is responsible for implementing programs in agriculture, horticulture and forestry and for providing all agricultural support services in the country. Its work is seriously constraints by lack of human and institutional capabilities to implement change, inadequate physical infrastructure, shortage of key skills and poor resources that are essential for providing efficient and effective services. Moreover, financial constraints hinder many planned developmental activities. The total budget available for agriculture development is small, just over US$0.25 million per annum, since agriculture is not considered a lucrative economic sector. Despite these shortcomings, efforts are been made to provide many essential services that are required by the small farmers in the country in order to improve their crop productivity and increase returns.

The existing organizational setup is simple. The two agricultural centers located in north and south of the country, are mandated to conduct basic research, training and provide the much needed extension services. Simple demonstration type research is conducted and the outcomes are forwarded to the farmers through demonstrations in farmer field schools, workshops, etc. conducted in the agricultural centers as well as through extension services in the form of leaflets, brochures and handbooks. Formal training at the agricultural centers is limited to "Farmer Upgrading Courses" and introductory courses on "Farming Practices". Upgrading courses are specifically conducted for farmers who have been practically involved in farming. Introductory courses are conducted for newcomers who are interested in agricultural activities. The letter is a more intensive course covering all aspects of crop production and protection. Apart from these courses, *ad hoc* training for interested groups as well as upgrading of the field staff of the Agriculture Section are also conducted at the centers. All training is aimed to provide farmers with improved agronomic practices using modern farm inputs such as high quality seeds, fertilizers and farm implements, effective irrigation practices as well as safe, pest and disease control mechanisms. Training and extension activities at farmers field is extremely difficult due to the isolated location of the islands, scattered over a vast area. Traveling is costly and difficult. However, training courses and workshops are conducted by the "Agriculture Centers" in many islands as and when requested by the small farmers.

Market exists for agricultural products. However, due to increasing competition from imported food, small farmers are no longer assured of high prices for their produce. Farmers incur high transport and transaction costs in marketing their output thereby reducing their net return. Through the agricultural services the daily market prices are broadcasted over the radio so the farmers are aware of the market price and can decide whether or not to bring produce to market. There is no public inter-island transportation network. Unlike other countries farmers have to utilize private dhoni's (a boat used for inter-island transportation) that do not operate on a specific schedule. Through collaboration with the local radio station, arrival and departure of these dhonis are broadcasted over the radio. However, such information is not often very reliable.

There is limited financial support available for farmers. Small farmers hesitate to borrow money due to low returns from agricultural activity. However, the government through responsible institutions is exploring ways and means of providing loans for small farmers with minimal interest rates. Donor organizations like International Fund for Agricultural Development (IFAD), UNDP, etc. have been assisting

the government in organizing loan programs for island development including agriculture. Table 1 shows the loan disbursement in Southern atolls under IFAD loan program.

Table 1. Loan Disbursement by Sector (June 1999 and October 2000)

(Unit: Million Rufia)

Sector	At June 1999			At October 2000			Increase	
	Number	Amount	Percent	Number	Amount	Percent	Number	Amount
Fisheries	19	0.416	2.8	46	0.843	2.5	27	0.427
Agriculture	98	1.030	7.0	121	1.552	4.6	38	0.522
Small enterprises	306	3.894	26.4	902	14.784	44.0	596	10.890
Trade	28	0.461	3.1	43	0.850	2.5	15	0.389
Transport	1	0.054	0.4	2	0.830	2.5	1	0.776
House construction	440	8.222	55.6	714	14.024	41.8	274	5.802
Others	2	0.700	4.7	3	0.710	2.1	1	0.010
Total	894	14.777	100.0	1,831	33.593	100.0	952	18.816

Source: Southern Atoll Development Project – Supervision Report.

Procurement of agricultural inputs has been a major problem for the small farmers as outlets selling such equipment and material are not located in the farming islands. Most of the items needs to be imported from abroad as they are not produced locally. It is not possible to establish one outlet in every island. However, the Ministry assists in establishment of supply outlets in the islands. Also, the Ministry has one major outlet in the capital Malé where many of the inputs (including good quality planting materials) are available at an affordable price.

The uninhabited island unit is involved in providing land for agricultural activities. Land which is a very limited resource in the country is used unproductively. To overcome this the unit is involved in careful leasing and monitoring of the islands. Land will only be provided to farmers who have the best plan for its development. The unit is also responsible for timber management of the country. Deforestation is a serious problem affecting food security in the rural islands in a number of ways. Trees such a breadfruit, country almond, etc. provide food as well as timber. Timber is also a source of fuel, which a large number of farmers still depend upon to cook their food as well as process agricultural produce for market.

Apart from providing the above services MoFAMR constantly searches and lobbies for financial assistance to conduct small projects in islands where agricultural activities are practiced or where people are interested in initiating such activities. These projects provide small farmers the opportunity to obtain much needed inputs such as tools and equipment as well as good quality plating material. Simultaneously, the farmers or farmer groups from the community are given the opportunity to establish large plots of fruit trees which in the long run provide good economic returns.

Issues/Problems Affecting the Delivery of Agricultural Services to Small Farmers

Efficient delivery of agricultural services is seriously constrained by a shortage of trained and skilled staff. Moreover, structuralized and synchronized training facilities do not exist in the present agricultural setup. *Ad hoc* trainings conducted are insufficient to upgrade the knowledge of farmers in a way that can benefit them. Training packages need to be designed to help develop and upgrade technical skills among farmers and interest groups.

Special credit schemes for agricultural development are merges. Commercial banks are not willing to lend to small farmers and development banking for agriculture is very inadequate. There has been a tendency for commercial agriculture and establishment of plantation crops by small farmers. But this has not provide successful because the financial investment required is beyond the reach of small farmers. The current institutional arrangements need to be strengthened to unable better credit facilities with lower interest rate affordable by small farmers.

Agricultural activities by small farmers are largely carried out in the inhabited islands. The land under cultivation consists of plots, so small that they could be termed home gardening. Although per unit production is small, the total agricultural output from combined plots is significant. However, a good percent of homestead production is not reported at all or incorrectly reported as farmers are unaware of the need for

and usefulness of documentation and statistics. While it is recognized that there is potential to increase output, the lack of reliable agricultural statistics makes planning, policy analysis and formulation of developmental projects a difficult task. Even basic information regarding land and its utilization, area, yield of production, etc. is lacking. The institutional arrangements for collection of data from the field and their processing are also inadequate. Appropriate formats, procedures and arrangement for collection, processing and publication of data are also lacking. In addition, lack of price information is a constraint to increasing supplies to the market. Focus on strengthening the capacity of national statistical systems to provide reliable and timely food and agricultural statistics is pivotal.

Markets exist for all agricultural produce, however, geographic fragmentation of the markets acts as a barrier to increase agricultural production by small farmers. In islands specialized for agriculture, private facilities for marketing exist to a certain extent. In general, marketing is the major constraint faced by the small farmers. Most of the production takes place in the outer islands away from the main markets so there is a need to transport perishable crops over long distances. This reduces the quality of produce which often becomes unmarketable. It is estimated that about 25 percent of the total production is lost as postharvest spoilage. In addition to poorly developed local transportation systems, unreliability of transportation timings particularly for rough weather conditions, uncertainty of load space on vessels, inadequate harboring and loading facilities, poorly organized marketing systems and incomplete market information to the growers and the transportation cost add to this constraint.

Research and extension in terms of both quality and quantity is weak and inadequate. No proven package of technologies and practices are available to the farmers. Presently there are no appropriate research facilities and infrastructure. Specific technology packages introducing more productive systems need to be identified through research and demonstrated by efficient extension services. Delays and incompatibility of such services often reduce farmers confidence, they also enhance environmental degradation. Inadequate extension services result in excessive and indiscriminate use of chemicals by the farmers, which adversely affects the environment and creates problems associated with food safety and quality, human and animal health.

Role of NGOs and Private Sector in Providing Agricultural Services to the Small Farmers

Private sector and NGO involvement in providing agricultural services to small farmers are limited in the Maldives. NGOs are primarily involved in securing financial assistance from local and foreign donors. However, such projects are small and provide minimal services and are restricted to a small part of the community due to financial and other restrictions. Under some of these projects volunteers (mostly people straight from university with only an academic background) from abroad are also placed with communities in order to assist the farmers. During the process of project formulation and implementation, MoFAMR is kept informed and technical assistance is provided and also be consulted before and during the process of project formulation and implementation.

The processing, marketing and transport of agricultural produce is at a very informal level. Private sector has been quite actively involved in providing services such as opening stores with agricultural outlets. Mobile markets owned by private parties travel to the islands and purchase agricultural produce from the farmers, however the farm gate price is very minimal, and the farmers make the least profit.

Improving the Delivery of Agricultural Support Services to Small Farmers

In order to improve the delivery of agricultural support services in the country it is necessary to strengthen the existing "Agriculture Centers" to provide systematic training at a national level to enhance the level of knowledge and awareness of the farmers. Emphasis should be given to train farmers in various technical fields related to crop production and protection, at the same time giving due respect to environmental concerns. In order to achieve this, staff training and recruitment is necessary so that services to small farmers could be delivered efficiently and effectively. Those passing-out from school should be encouraged to join the sector by providing them more incentives and opportunities of training. Staff training should be strengthened by providing them with opportunities to attend workshops, seminars and on-the-job training overseas.

These is need to strengthen the capacity to produce reliable statistics on food, agriculture and livestock for effective decision-making. Development and implementation of a reliable market information system and production of more regular publications on agricultural statistics should be ensured. This would help in

convincing the donors and investors to provide financial support for agricultural activities by which small farmers would be benefitted.

There is need to establish a marketing and transport system to encourage production and reduce postharvest spoilage. Regional and mobile markets would be encouraged to enable growers to have direct access to the market without the middleman intervention. Storage facilities need to be enhanced to cope during times of uncertain transportation as well as reduce postharvest spoilage. In order to invest in alternative income-generating activities ways and means to establish appropriate food preservation methodologies for agricultural produce should be immediate. Private sector and community resources should be mobilized for the creation of infrastructure and investment in the development of rural markets and transportation system with the government providing the counterpart funding when large investments are involved.

There is need to improve agricultural research in the area of crop production and protection technologies. Introducing viable new technologies focused on sustainable use of natural and physical environment through coordinated research and delivering the information by efficient extension services will be given priority. Efforts should be made to affiliate research and development regionally and internationally.

Optional utilization of natural resources such as land and water, etc. for sustainable agricultural development should be given top priority. Guidelines and codes should developed in this regard. It is necessary to develop soil-testing facilities and disseminate information on simple methods of maintaining soil fertility to sustain and renew soil fertility using locally available materials as much as possible. Emphasis should be given to ensure continuous supply of nutrients to the soil without polluting the water. Continuous use of chemical fertilizers should be discouraged and organic composting techniques should be promoted to sustain land fertility and productivity. There is need to develop packages of appropriate irrigation systems suitable for effective utilization of water. Monitoring the long-term effects of agriculture on water tables, i.e., changes that take place with regard to water quality and quantity.

It is extremely important to develop an effective integrated pest management system which is crucial for sustainable agricultural development. Integrated use of basic pest control measures using selected and environmentally safe chemicals, biological control measures and improved cultural practices, e.g., crop hygiene, rotation, weed control, inter-cropping should be given priority. Emphasis should also be given to strengthening plant protection capability by enhancing plant quarantine units and the diagnostic facilities of the laboratories. This will minimize the introduction of pest and diseases and enhance reliable diagnosis. A tissue culture laboratory should also be set up for mass-producing plants to reduce importation of planting materials and the risk of importing pests and diseases. Pesticide registration scheme should be established to register the agricultural chemicals use in the country. This will reduce occupational health hazards as well as pollution of the fragile environment in the Maldives.

There is need to produce publications, handbooks, leaflets and brochures on agriculture-related topics, and carry out research locally. Modern technologies for information dissemination should be strengthened to deliver services efficiently and effectively. Diversification of agriculture should be encouraged by intensifying poultry and animal husbandry, particularly goat-rearing. This will provide farmers the opportunities to earn higher incomes and find agriculture a fruitful venture. Allied activities have the potential to increase production of meat and/or eggs leading to import substitution or significantly reduce importation.

It is extremely important to improve access to financial resources by developing credit schemes for short- and long-term loans at minimal interest rates and extended grace periods.

It is also important to overcome the inadequacies in enforcing the laws and regulations regarding many basic aspects of agricultural development in the country such as land use planning, plant quarantine, import of agriculture produce, etc. This would pave the way for the farmers to benefit from their hard work.

Lastly, awareness programs should be conducted for farmers to enable to them realize the importance of consuming nutritious food, especially for the younger generation. There is a need to encourage farmers to consume nutritious produce from their gardens in order to keep themselves as well as their children healthy.

If the above areas could be strengthened in the Maldives, small farmers in the country would be benefitted significantly. However, this could only be possible for the Maldivian Government if assistance was forthcoming from donor organizations. The needed reforms and reorganization of institutional structures is possible by the government.

19. PAPUA NEW GUINEA

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INTRODUCTION

Food Security

1. ***Food Demands and Nutrition Needs***

The ample land resources and humid tropical climate of Papua New Guinea (PNG) provides a bountiful harvest which ensures an average per capita daily calories intake of 2,240 (compared with an estimated requirement of 2,144 calories) for the population of four million people. In 1993 cereals contributed 24 percent of the total energy supply; starchy roots, 29 percent; fruits, 15 percent; animal products, 11 percent; and added oils and fats, 9 percent. The majority of the population are smallholders whose food demand is met by subsistence production of the traditional staples of sweet potato, taro, yam, sago and bananas. On plantations and in urban areas, people rely on a mixture of purchased and own-produced food. Pigs and free roaming chicken are the traditional (subsistence) source of animal protein, but due to changing food patterns and a growing urban population the demand for milk and mutton has increased considerably during the last decade. Fish consumption complements the diet, especially in coastal areas and some of the inland river valleys.

2. ***Food Supplies***

It is estimated that the domestic production of major food crops amounted to 4.14 million mt with a farm-gate value of about US$0.86 billion (cocoa and coffee not included). Production is dominated by tuber and root crops, with approximately 0.70 million mt of sweet potatoes and 0.60 million mt of taro, yams, cassava and other root crops. In addition, 0.67 million mt of bananas, 0.65 million mt of coconuts, 0.51 million mt of breadfruit and other fruits, 0.39 million mt of vegetables, 0.35 million mt of sugarcane, and 0.27 million mt of oil palm were produced. PNG is self-sufficient in eggs, chickens and pork. About half of the fish demand is satisfied by the domestic production of 0.04 million mt per year. Other domestically supplied food items include some rice, maize and beef. During 1993 PNG imported 217,000 mt of rice and 103,000 mt of wheat, 40,000 mt of mutton, and also minor quantities of beef and fish products. Expenditures for food imports reached US$199 million in 1993. Over the period 1981-91 physical imports of wheat increased by 6.7 percent per annum and of rice by 3.7 percent per annum.

3. ***Food Insecurity and Poverty***

Despite the fact that, in most circumstances, the traditional customary clan system ensures a secure supply of food for individuals living in the rural areas, malnutrition rates in PNG are among the highest in the world, principally as a result of seasonal shortages of dietary imbalances. Infant mortality rates range from 50 to 100 per 1,000. Of the under-five population, 30 percent are underweight, 43 percent stunted and 5.5 percent wasted. One-quarter of the population are considered at risk of vitamin A deficiency. Iron-deficiency anemia is common, and goitre is endemic in some rural areas.

The distribution of income is highly skewed. Thus, although the national average per capita income is estimated at US$1,130, the poorer 80 percent of the population has an average per capita income of about US$350. The quality of life and social indicators for the majority of the population is not better than that in an average low-income country.

POLICY AND PROGRAM HIGHLIGHTS

Economic and Institutional Policies

The government's vision of the future include: a vibrant private sector, employment creation, increased opportunities for rural production, improved delivery of rural services, movements towards development of an industrial base, increased domestic economic activities, and sound macro-economic performance. However, since 1989, PNG has experienced a difficult period of adjustment due to a sharp fall in the terms-of-trade and closure of the large cooper and gold mine, Bougainville Copper Limited (BCL). The government responded promptly with a broadly-based adjustment program (assisted by the World Bank) which included tightening monetary policy, devaluation of the Kina, and instituting a program of expenditure controls and new revenue measures to stabilize the economy. Further, the government initiated a series of reforms aimed at enhancing international competitiveness, including privatization, improving public sector management and deregulating wages.

Social Policies and Programs

In order to improve the access of poorer groups to government services, in July 1995 the government launched the Organic Law which dictates that the planning and implementation of all development programs and projects must be based on district level requirements. This places the focus on investment at the district level. Development resources should be channeled directly to the rural areas and will be used for human development and the improvement of living conditions, e.g., improvement of the efficiency and equity of service delivery, such as health, social and educational services as well as improvements in infrastructure and agriculture. Further, the government has placed greater emphasis on the involvement of NGOs in development.

PNG's National Health Plan (1996-2000) focuses on five priority policy areas: increased services to the rural majority; expansion of health promotion services; reorganization and restructuring the national health system; developing staff professional, technical and management skills' and upgrading and maintaining investments in infrastructure. For reaching the targets indicated in the National Education Plan (1994-2000) two main strategies are being implemented: Quality Education for All (through awareness campaigns, school construction, subsidized school fees, teacher training, curriculum reform, and provision of textbooks, equipment and material, etc.); and an Education Reform, aiming for increased enrolment and preventing of early dropouts.

AGRICULTURE SECTOR

Agriculture in Economy

Agriculture is the dominant economic activity in PNG providing livelihood for about 75 percent of the total population, either through subsistence agriculture or the cultivation of cash crops. The sector has a distinctly dual nature: traditional smallholder farming systems and the cash crop sub-sector producing for exports (e.g., plantations) and the urban markets (especially for import replacement). Forestry contributes less than food crops to rural livelihoods, but the forest sub-sector is the second largest foreign exchange earner after mining.

About 90 percent of the land with agricultural potential is held under customary land tenure system, within which clans grant to individual families the right to use, but not transfer, parcels of land. With increasing population growth and the spread of cash crops, the sustainability of the traditional use system has been challenged.

Two distinct sub-sectors can be distinguished in agriculture: estates, which hire labor and which produce mainly tree crops for export; and smallholders, who grow cash crops, mainly for export, and staple root crops, fruits and vegetables for their own consumption or for sale on a small scale in their immediate vicinity. Farming systems are highly adapted to the local environment. There are four main farming systems in PNG: i) sago and taro-based systems in the wet lowlands; ii) yams, bananas and cassava-based systems in the dry lowlands; iii) taro and sweet potato-based systems in the highlands and its fringes; and iv) sweet and Irish potato systems in the high altitude valleys. Smallholders have traditionally accounted for most of the output of the main export and staple agricultural commodities, namely; coconut, cocoa, coffee, rubber, oil palm, cardamom, chillies and pyrethrum. Tea is the only export crop which is almost entirely grown on

estates in the highlands. The principal crops for domestic consumption include sweet potatoes, banana, taro, yam, sugarcane, maize and groundnut. Virtually all smallholder crops are rainfed, inter-cropped, have low input levels and low productivity. Food crops account for more than 50 percent of total agricultural output, and only about 25 percent of production is marketed.

The livestock sub-sector accounts for about 13 percent of agricultural production, of which subsistence pig and poultry production accounts for about two-thirds. Broiler production dominates the commercial sphere, followed by beef, eggs, crocodile skins and port. Pigs play an important economic and cultural role in the village, particularly in the highlands, providing wealth, status and protein.

It is estimated that about one-third of land has forestry production potential, but 70 percent of that area is still not adequately mapped and located. Although most forests are owned by customary owners and clans, the government issues logging licenses to private operators.

Recent Performance

During the decades of the 1980s and 1990s the agriculture sector grew by an average of only 1.7 percent per annum, which led to a decline of almost 20 percent in rural per capita income. The agriculture sector contribution to GDP during recent years is stagnant, in the range 26-29 percent. Other sectors, particularly mining, have expanded in the same period. Similarly, agricultural exports as a proportion of total merchandise exports have declined from 37 percent in 1985 to about 15 percent in 1995.

The single most important cause of poor sectoral performance over the last years is the halving of world market prices for the tree crop commodities (coffee, coca, copra and palm oil), which was only partly offset by domestic policy action (devaluation of the Kina subsidies). Other factors contributing to the poor sectoral performance include low productivity in smallholder production systems, poor product quality, high costs of production (high labor, transport and processing costs), excess processing capacity and costly marketing systems. This combination of factors has made PNG significantly non-competitive in many of its traditional agricultural export markets.

As a result, private sector agricultural investment has been insufficient even to cover depreciation of capital since 1989. Maintenance and replanting of smallholder tree crops have come to a halt: plantations have laid off almost 20 percent of their labor supply; no major new investments have been undertaken by the private sector plantations; and use of modern, imported inputs has dropped by about one-third. Public sector allocation for the agriculture sector has also declined, both absolutely and relatively. The forestry sub-sector has been suffering in the same period due to absence of a coherent and implementable National Forestry Plan, unclear ownership and increased world market competition by neighboring countries, which resulted in a drop of approximately 25 percent in production volume. Expenditures for food imports reached US$199 million in 1993. In 1993 PNG imported 217,000 mt of rice.

The composition of demand and sources of supply have been changing in recent years. Cereal consumption has expanded rapidly during the last 10 years (e.g., p.a. in the case of wheat). With the exception of poultry, pigs and vegetables, the domestic supply of crop and livestock products has stagnated or even declined. Commercial food grains and tuber production has increased in recent years but did not keep pace with population growth rate.

Sectoral Objectives, Policies and Programs

The government recognizes that agriculture will continue to be one of the most important sources of income and employment, and that developments in this sector can help reduce law and order problems. Government policy is to ensure the viability of agricultural production and marketing, sustain growth, increase income generation opportunities and improve the rural standard of living. Four areas are given high priority and represent the key elements of PNG's sector development program. The first is the equitable delivery of quality agricultural services, including fisheries. The second priority area is to increase food security and nutritional levels of those involved in subsistence agriculture. The third priority area is the development of export commodities, including diversification into alternative crops in order to reduce vulnerability to price fluctuations of traditional export crops. The final priority area is that of the development of downstream agro-processing for agricultural crops, fish, timber and other resources, including cottage industries. The government's objective towards fisheries is to develop a fishing industry that is internationally competitive, generates employment, expands local food supplies and reduces imports.

1. ***Agricultural Production and National Food Security***

The government's overall goal for modernization, expansion and diversification of export crops, alternative crops, food crops and livestock production in the agriculture sector is to improve the level of rural income, employment and the standard of living. Key elements of agricultural production and food security are: strengthened agricultural research and planning at all levels; improved agricultural extension services; and enhanced food production and food security. Project activities will include the participatory analysis of existing food producing farming systems, identification of constraints to increase productivity at both the policy/institutional level, and experimentation of improved technologies and farming system. Rural micro-credit systems and small businesses will be supported to create job opportunities and strengthen rural livelihood systems through support to the expansion of viable, community-based, micro-credit systems and business training services. Local food production has been protected through a combination of import bans and tariffs on sugar, poultry, pork, fruits and vegetables.

The development strategy recognizes that the smallholder sector continues to be the backbone of the agricultural production systems whereas the large holder private sector will be important for commercialization of the agriculture sector. Based on favorable agro-ecological conditions and using the new Organic Law PNG is aiming for national food self-sufficiency and will launch supportive policies on infrastructure development and marketing systems, e.g., the encouragement of the private sector to invest in grain and food crops and livestock industries, the planned increased in area under the high-value and income- and employment-generating production of vegetables and fruits, especially by women, for market and household consumption through the activities of the Fresh Produce Development Company (FPDC). There is also a need to integrate innovative practices into traditional farming systems, to reduce costs and increase output. The Government of PNG places high priority on improving productivity, quality and efficiency in the export tree crop sub-sector. An important objective is to reduce production costs for tree crops and enhance competitiveness. Ongoing deregulation of the rural labor market has been put in place. Financial restructuring in the plantation sub-sector is also required to overcome short-term difficulties. In fisheries, the actual potential of tenfold of the recent production is to be increased by enhancing specifically the processing sector. In 1995, several major investment products were underway, including a major loan project for fishery development by the Asian Development Bank (ADB).

2. ***Rural Poverty and Household Food Security***

The government's declared objective is to make available adequate, nutritionally balanced food in all parts of the country through increased food production, promoting inter-district trade and expanding off-farm income earning opportunities. The key to improving food access is the upgrading of the existing infrastructure, especially, the road network and education programs on nutrition for households.

3. ***Agricultural Production Promotion Policies and Programs***

The FAO Special Program on Food Production in Support of Food Security provides assistance to the Department of Agriculture and Livestock (DAL) for the demonstration of technologies for boosting food production. The pilot area is located in the Markham valley, Morobe province. Staff training and the diagnosis and planning for the coming season of demonstration has been completed.

The Parliament has just passed the Bill governing the restructuring of agricultural research, following technical assistance from FAO for the finalization of the strategy and design. Technology development for coffee, cocoa, palm oil and rubber will be the responsibility of four research institutes, funded from the industry sources. Food crops research will be conducted by the National Agricultural Research Institute in different agro-ecological zones, funded largely by the government. The latter has been reorganized on a multidisciplinary basis; and external support for the implementation of the restructuring and strengthening of the institutes has been secured.

The PNG coffee and cocoa quality must be improved and maintained in order to expand markets and command higher prices on the commodity markets. Cocoa research, undertaken under the Cocoa Quality Improvement Project, funded by the Australian Agency for International Development (AusAID), is aimed at improving fermenting techniques and drying practices to enhance flavor. The World Bank is assisting a major smallholder oil palm development project in the Oro province. New comprehensive fisheries legislation governing conservation and management of fisheries was passed in 1994. Technical assistance with the establishment of the National Fisheries Authority was provided by FAO, covering training, commercialization of small-scale fisheries, quality control and policy advice. In addition, the Sepik River Fish Stock

Enhancement Project promotes sustainable development and improved security for underprivileged populations living in the remote Sepik valley.

DAL has identified the following major areas of intervention and the respective objectives are in the process of implementation. The estimated related costs are given in brackets.

* Agriculture planning and research to assist in improving the database pertaining to agricultural production in order to enhance district and provincial level agricultural planning (US$5 million).
* Piloting of innovative extension services to support national efforts to develop effective, community-based, extension services that are responsive to the needs and priorities of farmers (US$10 million).
* Enhanced food production and food security to enhance governments capacity to plan and achieve greater food security at the national and household level and to raise rural incomes and standards of living, with particular focus on enhanced rice production and horticulture development. Project activities will include the participatory analysis of existing food producing farming systems, identification of constraints to increase productivity at both the policy/institutional level, and experimentation of improved technologies and farming systems. The pilot interventions may include support to increased rice promotion, depending on the results of the participatory planning exercises (US$10 million).
* Piloting of rural micro-credit systems and small business support to create job opportunities, promote small-scale enterprises, and strengthen rural livelihood systems through support to the expansion of viable, community-based, micro-credit system and business training services (US$5 million).

4. ***Prospects for Trade in Agricultural Products***

Production of fruits and vegetables is limited by the fruit fly problem and needs to be addressed immediately. In fishery, rich potentials are also untrapped. Until now, licenses to foreign fleets earned only 4 percent of the value of the catch, which is low by international comparison. Prospects for trade, therefore, lie in the improvement of domestic capacities. The global trade liberalization measures under the World Trade Organization (WTO) framework are likely to have considerable impact on the infant industries under government protection in the form of bans, quotas with tariffs. It also imports a wide range of agricultural products and equipment. PNG's food import bill continues to increase and averages about 17.2 percent of all imports in the past decade. The government policy approach will be to provide an enabling policy environment for its agricultural exports while seeking to reduce import bills on food products.

REQUIREMENTS FOR ACTION

Major Challenges and Constraints

Major challenges facing PNG in increasing domestic food production and improving food security are decreasing/insecure world market prices for the major export crops (cocoa, coffee, rubber, palm oil), the increasing demand for food imports (cereals, beef, mutton), environmental degradation (deforestation, soil erosion), and marginalization of the rural poor. Government has identified a number of key constraints to overcoming these challenges:

* Overvalued exchange rate makes PNG products costly and less competitive on the world market and requires government subsidies to keep production economically viable for producers, secure employment in the sector and generate farm household incomes in production areas;
* Poor transportation infrastructure system, hinders market access and dissemination of new technology and market information;
* Inadequate resource allocation to the agriculture sector: the share of national government resources to the DAL continues to decline, from 9.3 percent of the total national budget in 1985 to approximately 2.0 percent in 1998;
* Current public service terms and conditions are not conductive to employing and retaining high quality and experienced professional staff in rural areas;
* Low productivity and production of agricultural crops, closely related to low farmer commitment. Both are results of unstable yields, low farm management skills, insecure market incomes, a lack of farmer cooperation and/or cooperatives, inadequate credit schemes, and social and cultural obligations, laws and especially land tenure arrangements;

* Unstable yields as a consequence of increasing soil erosion, declining soil fertility, increasing disease and pest pressure as results of the extreme weather conditions and landscape, the lack of agricultural inputs and appropriate machinery (for land preparation and irrigation), partly related to unavailability of credit for the majority of farmers and the low farm management skills in (in economic and technological terms);
* Weak linkages between farmers, extension and research;
* Poor infrastructure, high production and transport costs, lack of downstream processing and market-related insufficiencies;
* Lawlessness in rural areas prevents villagers from working gardens and also increases costs particularly for plantations, buyers and processors; and
* Culture-related constraints prevent the foundation of cooperatives, lead to the hazards and are the major source of land disputes.

Strategic Options

A dual track approach offers the best option for fostering agricultural development: (1) creating a positive environment for increased production and for the cash crop plantations; and (2) addressing the needs of the smallholder sector, which is still the backbone of PNG agriculture. The first requires improvement of macro-economic policies, reforms, trade interventions and infrastructure. The latter should use a systems approach for upgrading agricultural services, especially for an improved and more adequate research and extension. Based on participatory analyses of existing farming systems in the different agro-ecological zones, constraints, potentials, options and related risks should be identified and taken as the basis for recommendations towards sustainable agricultural development and resource management. Specific required actions are identified in the program and areas for action in the respective columns in matrices 2.3 and 2.4.

The project current account deficit plus capital grants for the period 1997-2002 is 2.6 percent of GDP. As concerns the agriculture sector (including crops, livestock, forestry and fisheries) major areas of investment needs are: (1) construction of feeder roads to improve smallholder market access; (2) irrigation development and drainage (especially for increasing rice production and palm oil expansion); (3) capacity building at all levels, including national, provincial and districts levels (for implementation of investment programs); (4) livestock development (abattoir renovation and development, cattle ranching, sheep production, honey bee development); (5) downstream processing covering all crops and food crops (priority area of value adding and employment generation); (6) horticulture industry (potential for development for both domestic and export markets – address fruit fly problem as major limiting factor); (7) expansion in some export crops such as the oil palm; (8) fisheries has huge potential for development and downstream processing; and (9) forestry has good potential to attract sustainable forest development investments activities.

Resource Implications to 2010 (Investment)

(Unit: US$ million)

Investment	Private	Public	Foreign Aid	Total
Total primary production	165.5	60.6	22.1	248.2
Irrigation and drainage rice production	6.7	2.4	0.9	10.0
Land development (food crops)	36.9	13.5	4.9	55.3
Land development (cash crops)	121.9	44.7	16.3	182.9
Total post production	73.6	27.0	9.8	110.4
Processing industry	36.8	13.5	4.9	55.2
Storage facilities	36.8	13.5	4.9	55.2
Public support	87.8	24.9	9.0	101.8
Total investment until 2010	326.9	112.5	40.9	460.4
Research	3.3	1.2	0.4	5.0
Extension	2.7	1.0	0.4	4.0

Policy Institutions Matrix

Policy and Institutional Implications

Policy Areas	Constraints/Issues/Goals	Policy Actions	Responsible Agency
Economic Environment of Agriculture	* Declining resource allocation to agriculture; * Declining private investment in the sector; * Inconsistent sectoral policies; and * Ineffective central planning and coordination.	* Increased and timely resource allocation to agriculture; * Facilitate coordination between government departments (Planning, DAL, Forestry, Authority, Public Works, etc.); * Develop national/provincial/local government capacities in pro-ject planning and management; and * Decrease import taxes/tariffs for agricultural machinery/ implements.	* DAL, DOF, ONPI, PDAL * DAL * DAL, PDAL * DAL, IRC, DOF
Land Tenure	* Traditional customary land tenure system leads to land disputes/conflicts and prevents investment in agriculture.	* Implement Land Registration Act; and * Lease-lease back arrangements.	* DLPP, DAL, PDAL
Food Security	* Food production is not keeping pace with population growth, declining trade balance, and growing food import bills; * Wide disparity in income distribution among households; * Changing of food habits form root/tubers to rice and cereals; and * Poor understanding of nutrition.	* Allocate resources to improve research and development; * Integrate innovative practices into traditional farming systems; * In addition to structural adjustment launch adjustment in pack-ages to stimulate food production; * Launch/increase nutritional education programs; * Foster linkages with universities (Unitech) and education; and * Promotion house/kitchen gardens.	* DAL, DOF, NARI * DAL, NARI * DAL, DOH, DOE, NGOs * DAL, DOE
Agricultural Trade	* Declining world market prices for major export crops; and * Low value/weight ratio for traditional staples and their high perishability.	* Price stabilization and subsidy scheme in support to producers at low price periods; and * Improve market access (infrastructure), marketing information system, packaging, processing, and the market outlets.	* DAL, industry corporations, commodity boards * FPDC, Unitech, DAL
Sustainable Resource Use	* Population growth leads to unsustainability of traditional cropping practices and overexploitation of national resources.	* More effective participatory extension systems; * Foster linkages between farmers, extension and research; and * Upgrade research capabilities for technological development.	* DAL, PDAL * DAL, PDAL, NAR * NARI
Rural Employment	* Rural underemployment	* Intensification/diversification of primary production and down-stream processing	* DAL, FPDC, NARI
Alleviation of Rural Poverty	* Little income possibilities in rural areas without cash crop production	* Intensification/diversification of primary production and down-stream processing	* DAL, FPDC, NARI

Program Targets and Goals

Program Areas	Goals (Year 2010)	Constraints	Actions	Responsible Agency
1. General Agriculture Land	Increase of agricultural area from 830,000 ha (1995) to 1.2 million ha.	Missing infrastructure, specifically transportation facilities and roads; traditional tenure; conflict forestry conservation; and agricultural use.	Facilitate DAL-DOF linkages; identify investment financing; and registration.	DAL, DOFP, DOW, DOT
Land under Irrigation	From extremely limited 1,010,000 ha.	Lack of technology, skills and investment.	Secure financing, launch pilot schemes and training programs.	DAL, DOFP
Cropping Intensity	Marginal aggregate increase; increase of 10 percent in special project areas.	Shortage of trained manpower, lack of effective research and extension; low farm management skills.	Extension and farmer training programs adaptive research.	DAL, NARI and PDAL
2. Food Crop Production	Increase of production to meet demands of growing population (2.3 percent annual population increase) or greater where special policy.	Generally low productivity; pests and diseases; absence of relevant and reliable farm level data; lack of credit to farmers; complicated land tenure arrangements; lack of adapted varieties for many food crops in many areas.	Raising food security by improvement of incentives and area expansion of food crop production, selection of improved local cultivars; priority for low input (low cost) technologies, to reduce cost of production; increased research on integration of technologies at farm system level.	DAL, DOEP, NARI, NAQIA, banks and PDAL.
2.1 Tubers/root crops, sweet potatoes	From 0.70 to 0.95 million mt	Low value/weight ratios and lack of storage hinder marketing	Improvement of postharvest and processing	FPDC, NARI
Cassava	From 0.12 to 0.16 million mt	- Ditto -	- Ditto -	- Ditto -
Other roots/ tubers	From 0.48 to 0.65 million mt	- Ditto -	- Ditto -	- Ditto -
2.2 Vegetables	From 0.39 to 0.53 million mt	Lack of adapted technology	- Ditto -	- Ditto -
Banana	From 0.67 to 0.90 million mt			- Ditto -
2.3 Rice and grains rice	From a very small production to 0.12 million mt (import substitution of 30 percent)	Low farm management skills, lack of technology; lack of political will.	On-farm research; commercial investment	

... To be continued

Program Targets and Goals (Continuation)

Program Areas	Goals (Year 2010)	Constraints	Actions	Responsible Agency
3. Livestock	Production increase from 0.028 to 0.033 million mt (3 percent per annum)	External competition; lack of processing industry; lack of trained manpower in extension and processing.	Encourage and facilitate research and development in livestock industry; improve human resources (veterinary, rangeland management, husbandry, etc.)	DAL, LDC
Pigs	Production increase from 2.5 to 5 million mt.	Lack of local feed; generally high production costs, including imported feed costs.		DAL, LDC
Poultry	Production increase from 5,000 to 7,900 mt (4.2 percent per annum trend increase).	As for pig feed.		DAL, NARI and industry
Beef	Accumulated increase by 50 percent	Poor pasture management and marketing high costs of production, poor water availability.	Research and extension	DAL, NARI, LDC, industry
4. Fish	Increase of domestic production and processing	Poor infrastructure to access inland markets; lack of investment money in processing industry.	Attraction of investment capital for canning industry	DAL, NFC
5. Cash crop production		Commercial production for most crops limited by domestic market size; depressed world price; poor transportation facilities; limited capital for expansion.	Expand credit facilities	PDAL, DOEP, RDB
Coconut	Stabilization of present production of 0.65 million mt	Conflicting usage of land for export crops (cocoa).	Strengthening of research in pest and disease control; rehabilitation and expansion to increasing production.	DAL, CCRI
Palm oil	Production increase from 0.27 to 0.52million mt		Expansion of VOP	OPIC, OPRA
Cocoa	Production increase from 0.038 to 0.042 million mt		Rehabilitation and replanting	CIB
Coffee	Production increase from 0.062 to 0.084 million mt	High variability of production due to pests and diseases.	- Ditto -	CIC, CRI
6. Forestry	Increase from 3.2 million to 5 million m^3 (53 percent)	Legal ownership and policy framework unclear.	Implementation of National Forest Plan of 1991; recognition of resource owners' authority over forest resources (logging).	NFA, industry

1. ***Human Resources Development***

In order to achieve the targets set forth above, investment in human resource development is required. In addition to ongoing projects and programs, the following additional technical assistance needs have been identified:

* Strengthening of the agricultural faculty, principally for the extension services and the private sector, and specialized in technical, economic and communications aspects.
* Strengthening agricultural technician training, as currently the supply of technicians for research, extension and the private sector is inadequate.
* Following the reorganization of agricultural research, reappraisal and re-engineering of agricultural extension services is essential, for which technical assistance is sought. This foresees parallel public and private systems following principles of farmer-centered or participatory technology identification and dissemination.
* Improved knowledge about balanced nutrition and food preservation through upgrading of education and teaching institutions as well as special training for extension staff.
* Several area-based farming systems development programs are required for comprehensive agricultural development of rural areas. The Momase Farming Systems Development Project has been identified but not yet financed.
* Land tenure. Practically all cultivated land is under complex customary tenure systems, which inhibits individual entrepreneurship, investment and technology development. Assistance with the assessment and where appropriate revision of these traditional systems is required.
* Provincial agricultural and forestry development support capacity. Strengthen capacity through training, improvement of research-extension-farmer linkages, development of government-NGO-private sector partnership arrangements and improvement of national-provincial monitoring and management linkages.

PRESENT SITUATION

Production

Eighty-five percent of this country's population continues to live in the rural areas and subsistence integrated farming systems is the means through which they sustain their lives. With the introduction of cash/tree crops, highly developed livestock and some vegetable food crops, market-oriented farming has been adopted, particularly around the more urban and road accessed areas that provide market access. The highland farmers grow most of the fresh vegetables and freight them to the more highly populated coastal cities and towns, both by road transport (one week) and air transport.

The demand for cheap food by the growing urban population and the severe production constraints (high agrochemical supply cost, high transport costs, extremely bad roads) within which the farmer has to produce has resulted in decline in production and food security is becoming a matter of concern.

The 1977 El-Niño drought that was experienced, demonstrated how serious food security issues can become to a society that is entirely dependent on land.

Institutional Reform

The present DAL used to be known as the Department of Agriculture, Livestock and Fisheries, (DALF). This Department included agriculture, forest, livestock and fisheries. Research stations on both crops and livestock were also included. This was changed to the Department of Primary Industry (DPI). This change excluded forestry and fisheries. Research stations continued to remain under DPI. Once again a change was brought about to make it the Department of Agriculture and Livestock in the mid-1980s.

Corporatization

In the early 1990s the Department went through yet another reform and restructure. This time it saw the corporatization of the major cash and tree crops sector which included: Coffee Industry Corporation; Oil Palm Industry Corporation; Coconut and Cocoa Industry Corporation; and Spice Industry Corporation.

This was largely done to provide a more specific extension advisory support service to the industry farmers. These industry corporations established within themselves:

* an Extension Advisory Unit
* a Research and Development Unit
* an Industry Affairs Unit that dealt with processing and marketing regulations and policing.

Soon after the corporatization of the cash crop sector, the food sector including food crops and livestock were corporatized into Fresh Produce Development Company and Livestock Development Corporation (LDC). These two were to collate and disseminate technical information, training and marketing surveillance information. FPDC is the more successful of the two. It continues to depend on government grants. LDC has gone commercial in food crop production to sustain its operations.

Three years ago the Department further corporatized its remaining functions of agricultural research through the establishment of the National Agriculture Research Institute (NARI) and the National Agriculture Quarantine and Inspections Agencies (NAQIA).

The Department through these corporatization has been weakened, even though it continues to play the lead agency role. Its main focus is in the area of food security promotion, planning, coordination, monitoring and evaluation.

All the corporatized agencies now charge certain fees for the goods and services they provide. This is affecting the growth and expansion of farmers, as their own production capacities are not commercial enough to afford the costs.

AGRICULTURAL SUPPORT SERVICE PROVIDERS

There are number of organizations that provide varying levels of support to agricultural development initiatives. These include:

National Department of Agriculture and Livestock through Its Four Regional Offices

The regional offices are staffed with highly skilled specialized officers in the areas of:

* marketing
* land use
* project preparation
* crop development and production
* livestock development and production
* extension information collating and dissemination
* economic services advisory.

These officers complement and link up with the Provincial Officers who further link up with the District Extension Officers who are the actual policy/program implementers.

Provincial Department – Provincial Head Quarters (PHQ)

Provincial departments are similarly expected to link up officers with the national department but in most cases they do not have the specialist man-power. They usually have general extension officers that deal with a wide range of technical development issues relating to development.

Provincial Department – Districts

The districts usually have a population of 40,000 people. The technical extension advisory staff number about five per district. These people are expected to implement their own district plans that have linkages to the provincial, regional and national plans. It is becoming extremely difficult for the districts to undertake anything effectively, as they do not have:

* adequate manpower
* resources (transport, funds, equipment)
* technical skills capacity
* administrative and planning skills.

Corporatized Industries – Support Service Providers

As mentioned above, the corporatized industries provide extension advisory support services to farmers within their specific industry areas. These include Coffee Industry Corporation for all coffee development, management and marketing. It also includes coffee breeding, research, pests and diseases surveillance and quality control.

The same applies to all the other free crop industries: fresh produce and livestock development companies also provide extension advisory services.

NGO – Support Service Providers

There are a number of NGO support service providers that provide technical support services that are sometimes more effective than those that are provided by the state agencies. The support service providers include:

* churches (Lutheran Development Service, Salvation Army)
* volunteer organizations (both national and international)
* agriculture bank agencies (providing for their own loan clients)
* farmer associations, cooperatives, self-help groups
* commercial interests-large producer organizations that sub-contracts production components to contract farmers that sell their final products to the commercial companies. The companies provide advisory services to safeguard their investment.

Public and Private Sector Roles in the Provision of Agricultural Support Services

Both the private and the public sector are undertaking extension advisory services excellently but in isolation. There needs to be communication between them which may lead to rationalization of their activities so as to minimize duplication and to achieve cost effectiveness and sustainability.

PUBLIC SECTOR ROLE

The role of this sector is to provide a national framework guideline on what should be happening, where it should be and at what levels. Having done that it should identify the training needs of both technical staff and farmers and provide appropriate training both nationally and internationally.

Infrastructure

The government has provided infrastructure such as building for produce purchase, grading, packing and marketing. This building constructed by the State is granted to the local council which in turn leases the building out to farmers that purchase from other farmers for sale to retailers and consumers.

Credit

A number of credit facilities have been established by the State and NGO agencies that provide credits to smallholder farmers. The State has set a revolving credit fund that has been divided proportionately among the sectoral industry organizations. These sectoral organizations have devised their own scrutinizing, lending, management and repayment systems. The industry organizations are having more success than those administered by both the national and provincial DAL.

The reason why they have a high success rate is because the industry corporations have resources to undertake follow-up visits, provide technical service support and to advise on the loan and in some instance transport the farmers produce to market. The interest rate of the loan facility is 5 percent. As there are set minimum lending rates the farmers cannot access lower amounts. To provide for small farmers credit facilities such as the ones that operate in Bangladesh have been established. These have proven to be successful with urban women farmers and the rural farmers.

Research and Development

Research and development are essential. Costs related to research and development can be enormous and the results will be forthcoming over a long period of time. This function remains a government responsibility. It will remain that way until farming practices reach a high commercial level.

PRIVATE SECTOR ROLE

As the public sector extension service provision is declining and not so effective due to poor and inconsistent resource support from the State, the strength of the private sector needs to be promoted and utilized.

Extension

The private sector should be encouraged to take on the responsibility of extension/advisory services provision for three reasons:

* Their service delivery costs are lower.
* Their investment would ensure a profit return service provision to the farmers.
* There is a reduction in the number of technical manpower in the public sector due to retrenchment.

Currently there is an Asian Development Bank (ADB) Project that is encouraging private sector organizations to competitively bid for contract service provider roles. It is showing some promise.

Downstream Processing

As this operation entails profit, it should be undertaken by the private sector. There are some farmers, operators who are successful and effectively providing these services in the areas of honey, jam, processing, packing and marketing. Quality control measures remain the function of the state.

Cooperatives and the Provision of Agricultural Support Services

In the face of rising costs and increase in the number of farmers producing the same commodity, formation of farmers cooperatives is a viable option. In the 1960s and 1970s, PNG had over 100 cooperatives dealing with many different commodities. The concept of cooperatives was not fully understood by the members. Executives of the cooperatives had misled members and at the same time raised the members expectations. This was to woo more members into the cooperatives. Executives of the cooperatives themselves lacked the fundamental management skills to adequately and effectively manage these cooperatives. As the cooperatives grew, they became increasingly difficult to manage. The cooperatives then began to collapse. To date, there are none functioning. After 30 years, it is becoming more apparent that the cooperative system needs to be reestablished. The farmers involved in the various industries are getting mobilized to form cooperatives.

The benefits to be gained through the cooperatives by the members are considerable. These are in the areas of: subsidized transport; subsidized supplies; and marketing arrangements.

The concept of cooperatives enables producer-farmers to become part-owners. Ownership is very important for sustainability and for elevating their confidence in production and participating meaningfully in commercial enterprises.

CONCLUSION

Papua New Guinea in the past 25 years has moved from a subsistence farming system to a semi-commercial system. The farmers are striving to improve their standard of living.

There is significant potential for agricultural development. The exploitation of this potential may be frustrated by high costs of production, a lack of good marketing system, insufficient and inefficient agricultural credit facilities and poor road infrastructure. Nevertheless in due course PNG will be a food processor and exporter. This will ultimately happen through farmer cooperatives which embody the spirit "Growth and Strength comes through caring and sharing". Empowering the small subsistence farmer will enable him to be in control of his 'destiny', and when he is control of his destiny he will have food security and sustainability will prevail.

1. LIST OF PARTICIPANTS, RESOURCE SPEAKERS AND SECRETARIAT

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2. PROGRAM OF ACTIVITIES

(4-11 July 2001)

Date/Time	Activity
Wed., 4 July	
Forenoon	Opening Ceremony Presentation and Discussion on Topic I: *Present Situation and Challenges of Agricultural Support Services in Asia and the Pacific* by Dr. Rita Sharma
Afternoon	Presentation and Discussion on Topic II: *Measures for Enhancing Efficiency in the Delivery of Agricultural Support Services in Japan: Agricultural Credit* by Mr. Katsumasa Ishige Presentation and Discussion on Topic III: *Cooperatives and the Development of Farming Guidance Activities* by Mr. Kenki Maeda
Thurs., 5 July	
Forenoon	Presentation and Discussion on Topic IV: *Measures for Enhancing Efficiency in the Delivery of Agricultural Support Services in Japan: Research and Extension* by Mr. Mitsuaki Sanada Presentation of Country Papers by Participants
Afternoon	Presentation of Country Papers by Participants
Fri., 6 July	
Forenoon	Presentation Country Papers by Participants
Afternoon	Presentation of Country Reports by Participants Video Presentation on Farming Organizations in Japan
Sat., 7 July	
Forenoon	Workshop
Afternoon	Free
Sun., 8 July	Free
Mon., 9 July	
Forenoon	Leave Tokyo for Tatebayashi-shi, Gunma prefecture
Afternoon	Visit JA Tatebayashi-shi (agricultural cooperative)
Tues., 10 July	
Forenoon	Visit Tatebayashi Agricultural Improvement Extension Center
Afternoon	Leave Tatebayashi-shi for Tokyo
Wed., 11 July	
Forenoon	Summing-up Session Closing Session