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Enhancement of Extension Systems in Agriculture

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(03-AG-GE-SEM-06) Report of the APO Seminar on Enhancement of Extension Systems in Agriculture held in Pakistan, 15-20 December 2003

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ENHANCEMENT OF EXTENSION SYSTEMS IN AGRICULTURE

2006
Asian Productivity Organization
Tokyo

Report of the APO Seminar on Enhancement of Extension Systems in Agriculture
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FOREWORD

Agricultural extension plays a key role in raising productivity by offering technical advice, helping farmers to identify problems and opportunities, sharing information, and supporting group formation. Traditionally, extension services were provided by the state in most countries in the Asia-Pacific region. In many countries, however, they have failed to meet their objectives, for various reasons, including weak organizational structure, insufficient incentive to extension workers, poor participation of target groups, and lack of communication among researchers, policymakers, and extension workers.

Recently, some progress has been observed in extension services in the region. In some countries, services are now provided not only by government but also by the private sector and NGOs. The group approach has also gained momentum in many countries. Extension systems are becoming more broad-based by including advice to farmers on farming systems and marketing linkages while advocating demand driven and participatory extension approaches. Thus extension systems are becoming complex networks of various stakeholders, i.e., researchers, extension workers, farmers, NGOs, and departments of agriculture. The seminar on "Enhancement of Extension Systems in Agriculture" held in December 2003 in Pakistan indicated that there is a need to enhance the scope of extension and the technical capacity of extension systems to meet the challenges of coordination and communication among various stakeholders. The seminar proposed a number of strategic options for APO member countries to improve the effectiveness of their extension systems, such as: 1) establishing a national-level body to develop and implement national extension policy; 2) enhancing the mandate of extension by covering topics such as marketing, input synchronization, and the environment in addition to the transfer of agricultural technology; 3) providing ICT-based networking to all extension units/training centers/research institutions for better communication; 4) revising the extension education curriculum at university level to make it broad-based and include the most recent communication methods like teleconferencing, videoconferencing, the Internet, and call centers; and 5) using a group approach in extension and promote farmers' organizations at the grassroots level. The seminar also concluded that effective on-line communication among research and extension functions/activities and among the agencies involved would continue to be an enormous challenge.

This volume is a compilation of the papers and proceedings of the seminar. I hope that it will serve as a useful reference on agricultural extension services to those in APO member countries and elsewhere.

The APO is grateful to the Government of the Pakistan for hosting the seminar, in particular to the National Productivity Organization and University of Agriculture, Faisalabad, for implementing the program, and to the resource speakers for their valuable contributions. Special thanks are due to Dr. V.P. Sharma for editing the present volume.

SHIGEO TAKENAKA
Secretary–General

Tokyo
March 2006

SEMINAR HIGHLIGHTS

INTRODUCTION

The Seminar on Enhancement of Extension Systems in Agriculture was held in Faisalabad from 15 to 20 December 2003. The Seminar was organized by the Asian Productivity Organization and hosted by the Government of Pakistan. The National Productivity Organization-Pakistan and University of Agriculture, Faisalabad implemented the program. Fourteen participants from 11 member countries and 5 resource persons from Australia, FAO-Rome, India and Pakistan attended the seminar.

The objectives of the seminar were to: 1) assess the prevalent Agricultural Extension Systems (AES) in member countries, and 2) suggest strategic actions to improve their performance.

The seminar consisted of the presentation and discussion of resource papers and country papers, as well as, field visits and workshop. The topics covered by the resource papers were: 1) Agricultural Extension in Asia and the Pacific: Time to Revisit and Reform; 2) Strengthening Education-Research-Extension Linkages for Effective Agricultural Extension Services-Experience of Pakistan; 3) Integrated, Multidisciplinary and Holistic Rural Development Approach for Effective Agricultural Extension Services; 4) Cyber Extension: Information and Communication Technology Applications for Effective Agricultural Extension Services-Challenges, Opportunities, Issues and Strategies; 5) Prospective Extension Methodologies for Improving Agricultural Productivity and Rural Livelihood; and 6) Participatory Extension-An Approach for Innovative Agricultural Development. The country papers reviewed the current developments and status of AES in the respective member countries, and highlighted the major issues in enhancing their AES and reforms undertaken by the respective governments. In the workshop participants identified and discussed the issues/problems in enhancing AES in the APO member countries and suggested strategies/actions to address them. The field study comprised visits to selected research laboratories and greenhouses of the University of Agriculture Faisalabad, and the United Farms of Agriculture and Dairy in Faisalabad district.

The highlights of the Seminar are presented below.

RESOURCE PAPERS

1. Agricultural Extension in Asia and the Pacific: Time to Revisit and Reform

(Dr. M. Kalim Qamar)

Agricultural extension today is not what it used to be. It is passing through a major transformation for various domestic and global reasons. This paper offered a glimpse of the major causes for transformation and the reforms that are currently going on in different parts of the world. The paper also suggests some directions for reforming the national extension systems in Asia and the Pacific Region.

The global movement for reforms in extension has emerged because of dissatisfaction with the public agricultural extension systems. These systems are full of flaws when judged against the latest trends in the world, and seem to be terribly outdated. General impression about the public extension system is that it consumes substantial government budget, yet is, neither too efficient nor too effective.

The biggest donor, who supported the public agricultural extension systems for almost two decades starting late 1970s, was the World Bank. One positive outcome of the Bank's efforts was that the importance of extension was recognized internationally. Although there was positive effect on yields, but there was no sustainability of project interventions. Many developing countries were put under burden of huge loans. The disappointment with the extension methodology of Training and Visit (T & V) system was expressed openly, and the Farmers Field Schools (FFS) was accepted as a better methodology due to its participatory feature. By the late 1990s, both governments and donors had become more frustrated with the public extension services. Measures like reduction in budget for agriculture, reduction in or removal of farm subsidies, and downsizing of staff under structural adjustment also affected extension.

The worldwide developments that have prompted reforms in extension organizations include: globalization and market liberalization, privatization, pluralism, decentralization, client participation and focus, natural disasters and wars, information technology revolution, rural poverty, food insecurity and HIV/AIDS epidemic, and integrated, multi-disciplinary, holistic and sustainable development.

The following directions are suggested to the policy-makers for reforming the national extension systems in Asia and the Pacific Region:

a) Formulate national policy on extension to ensure political and financial commitment;
b) Give extension profession a long overdue respectable status;
c) Reform pre-service education in extension in line with ongoing reforms in extension;
d) Decentralize extension without politicization but with early capacity-building of the decentralized units;
e) Promote pluralism in extension by involving public and private institutions;
f) Empower farmers' groups to create a lobby for extension;
g) Privatize extension where it is socially and economically feasible;
h) Prepare extension services to play a constructive role in post-war, post-disaster and epidemic situations;
i) Broaden the technical mandate of extension to aim at broader development of rural human resources;
j) Develop and apply information technology tools to facilitate but not to replace extension;
k) Develop original, location-specific, participatory, gender-sensitive and inexpensive extension methodologies and materials instead of imitating imported models;
l) Orient extension staff to major global developments that could eventually affect rural livelihoods;
m) Make extension services demand-driven for farmers' benefit and extension workers' professional satisfaction;
n) Separate the functions of extension financing and service delivery in the interest of efficiency and cost-effectiveness; and
o) Prepare extension services to promote sustainable development to safeguard resources for future generations.

Asia is the region that made headlines in the world during 1960s owing to its Green Revolution. The practice of extension, in this region of great agricultural and food production success traditions, should not continue to be old fashioned. The transformation of extension demands political and fiscal commitment from politicians and policy-makers so that this noble profession could serve the emerging educational needs of rural and farming populations a lot better than in the past. However, it is of great importance that lessons be learned from recent and ongoing extension reforms and applied to the designing of future reform measures in order to avoid repeating the known negative experiences.

2. Strengthening Education-Research-Extension Linkages for Effective Agricultural Extension Services -- Experience of Pakistan (Dr. Ansar Ali Khan)

Constitutionally, the Federal Government in Pakistan is responsible for policy planning, resource mobilization and inter-provincial coordination for agriculture and education sectors. The Provincial Governments are responsible for implementation of all programs. Agriculture and Education Policies of Pakistan are highly ambitious and theoretical in nature and lay major emphasis on enhancing per unit productivity, food security, poverty alleviation, human development, and better quality of life for all.

All operators of agriculture education, research and extension are aware of their expected roles, but there seem to be some gaps in the perception and actual performance of their roles at all levels.

The planning for agriculture, rural development and education is government controlled supply, rather than, demand driven program-planning approach, where local people and representatives of other stakeholders are seldom involved.

Recently the Government introduced devolution plan, which is still in its infancy, and the people responsible at district level for implementation of this plan are not yet fully conversant with the philosophy, rational and operational strategies of the system. As a result, the district instead of being a fully functional focal point for program planning has become isolated entity.

Agriculture development system in Pakistan generally faces the problems of insufficient funds, limited number of trained human resources, lack of training opportunities, inappropriate salary scales and promotional prospects, low degree of participation of small farmers and other stakeholders, weak planning, review, monitoring, evaluation, and Management Information System (MIS), comparatively young program of transfer of technologies and use of Information and Communication Technologies (ICT), lack of scientific information management skills among senior management and inadequately developed institutional research agenda. In addition, there are some specific problems related to agricultural extension and education. For example, in agricultural extension, there is a very weak mechanism for micro planning at village, union council, and tehsil levels to mobilize farmers into different interest groups/organizations for enhancing productivity per hectare and marketing their produce. Similarly, Pakistan is faced with the problem of ideally conceived theoretical models, which do not fit into the local situations with special reference to farmer's organizations, extension infrastructure and available human and financial resources.

Agriculture teaching and training institutes have irrelevant curricula, teaching learning and training materials insufficient equipment and physical facilities for practical pre- and in-service education and training. Moreover it was observed that agricultural universities at present were performing mainly teaching role whereas the other two roles namely research and extension had suffered severe setback because of lack of funds and inappropriate linkages with research stations/centers and agriculture extension programs.

Recognizing the above-mentioned major problems and issues and the need to achieve national policy goals and objectives, Pakistan generated meaningful experiences, which are presented below as the lessons learnt and suggestions made for future actions:

a) Frame realistic demand driven policies with achievable targets and firm commitments of resources and prepare corresponding appropriate short, medium and long term plans for implementation;
b) Decentralize existing semi-centralized decision-making mechanism by giving administrative and financial autonomy and authority to the lowest administrative level under devolution plan;
c) Decentralize the planning process in agricultural extension, and Prepare independent/flexible plans of action for each union council, tehsil and district;
d) Establish a clear line of authority by bringing all the agricultural universities, colleges and institutions under one administrative ministry/department having clearly established horizontal and vertical linkage;
e) Link all universities/colleges and districts with each other for planning and implementation of joint programs of agricultural education, technical/vocational education, extension and research;
f) Prepare realistic long and short term human capital development plan anticipating both pre-and in-service education and training needs, opportunities and facilities in agriculture research, agriculture extension and agriculture education areas. The plan should also provide for recruitment and training of female extension agents;
g) Decentralize to each agriculture institute the preparation of problems and need-based pre-and in-service education and training curricula and teaching/learning and training materials. Moreover, these institutes should also be equipped with physical facilities and provided with funds to impart practical training in degree/diploma programs and short courses;
h) Mobilize necessary resources to further strengthen existing monitoring, evaluation and MIS for agriculture development system;
i) Gradually introduce the use of ICT keeping in view the available human, institutional and financial resources for efficient transfer of agriculture technologies;
j) Further strengthen collaboration of agriculture development programs with the universities for organizing more agriculture fairs, adaptive research farms, farmer days, exhibitions, inter-district and inter-provincial visits of students, teachers, researchers, and farmers; and
k) Establish National Association of Agricultural Scientists on the pattern of Pakistan Medical Association for use as resource agency for preparing relevant curricula and joint sustainable plan to provide practical training facilities to final year B.Sc. (Agriculture) students.

3. Integrated, Multidisciplinary and Holistic Rural Development Approach for Effective Agricultural Extension Services (Dr. Andrew P. Davidson)

Agricultural extension is in crisis throughout the world. The concern driving the extension debate is increasingly one of what can be done to help farmers learn how to responsibly and profitably deal with the complex world around them such that who provides that help is ancillary. The debate, however, is obfuscated by the fact that social change is about prevailing interests making it difficult to disentangle as 'whom' is about multiple hierarchies of power that are embedded in specific and frequently contradicting contexts and ideologies. Thus it is important to consider how agricultural extension is conceptualized and then operationalized with respect to the various stakeholders - farmers and their families, the wider rural population, the agricultural input industry, government bureaucracies, and non-governmental organizations.

Many approaches to 'get agriculture moving' have been adopted and discarded over the past several decades. Recently development practitioners have turned to what is termed an Integrated, Multi-Disciplinary and Holistic approach to Rural Development (IMDH-RD), stressing the need to address both agricultural and rural problems to create effective and environmentally sustainable development. And, by explicitly acknowledging that what is occurring within the broader rural sector is fundamental to the success of agriculture; it implicitly gives primacy to rural populations and what they strive for, on the basis of their own understandings. To this end, we explore IMDH-RD in an effort to deconstruct and provide a more reasoned assessment of agricultural extension services. We do this through a reflection on

development paradigms, non-formal education, individual empowerment, and institutional pluralism. By calling into question the underlying dimensions of IMDH-RD, it is possible to develop an alternative paradigm and thereby generate new insights into agricultural extension. In short, the *raison d'être* of agricultural extension today must be on making it more inclusive and thus responsive to the needs of farmers and other rural inhabitants, integrating individual expectations with the wider socioeconomic, political and geographical environment.

Intrinsic to IMDH-RD is participation, which is intended to empower individuals and groups to be included in decisions that affect their lives. In this respect, non-formal education has made great strides, adopting such learning techniques and philosophies as student-centered learning, problem-based learning, and authentic. And to effectively cope with the challenges posed by a multi-sectoral approach, a pluralistic agricultural extension mechanism is required to coordinate the various stakeholders. Pluralism recognizes both the heterogeneity of the farming community and thus the need for diversity in extension service delivery systems.

An approach such as IMDH-RD requires farmers and other rural inhabitants, extension agents, input supply dealers, researchers, policy makers, and so on to focus their efforts, activities, and programs on encouraging a sustainable agriculture that is inclusive rather than exclusive. Unquestionably an integrated multi-disciplinary holistic approach for effective agricultural extension is laudable, but without linkages to substantive issues of who benefits and who does not, the state of the physical environment, as well as what ought to be (normative values), the cycle of despair will continue. Bold new innovations in extension services are required that are linked with rural concerns that not only facilitate agricultural production and productivity but foster rural wellbeing as well, including that of women and children.

What will an IMH-RD for Effective Agricultural Extension Services entail?

a) Sufficient levels of technical and institutional capacity to be put in place;
b) Strong support from all the actors involved; as well as ongoing coordination and negotiation in order to find common ground among multiple (and often competing) stakeholder interests;
c) Extensive research, analysis and monitoring to create the necessary links between diverse project components and to track a project's progress and impact over time;
d) Recognizing the need to attack the root causes of poverty instead of merely treating its symptoms;
e) Emphasizing that poverty reduction needs to promote long-term sustainability and avoid dependency; and
f) Adopting a comprehensive approach to poverty reduction that emphasizes the importance of enhancing people's overall well-being and empowerment.

4. Cyber Extension: Information and Communication Technology Applications for Effective Agricultural Extension Services-Challenges, Opportunities, Issues and Strategies
(Dr. V.P. Sharma)

Access to information and improved communication is a crucial requirement for sustainable agricultural development. Modern communication technologies when applied to conditions in rural areas can help improve communication, increase participation, and disseminate information and share knowledge and skills. The argument is being put forth that "Cyber Extension" would be the major form of Agricultural Extension in the near future. However the rural population in major Asian countries still has difficulty in accessing crucial information in order to make timely decisions. It is essential that information availability is demand driven rather than supply driven. The challenge is not only to improve the accessibility of communication technology to the rural population but also to improve its relevance to local development.

ICTs have started to make their presence felt in Rural Asia. The farmers and farm-families are browsing the net and getting general, technical and marketing information from the Information kiosks in over 5000 villages across India. If the rural area can be connected and the "masses" are empowered with "Information", the Rural Economy will take a leap forward into the Digital Millennium with a great speed. The process has already started. The focus on "e-Governance" and "IT for Masses" is also emerging as front-runner in all Asian countries' vision documents. For this purpose, technologies especially suitable for rural areas are being developed and deployed. Portals on Rural Markets and Agricultural Services are being hosted. District level Web Sites are being hosted, Information Kiosks are being established at sub-district and village levels and the technical and other need-based information is being collected, digitized and hosted on the Internet. The "Pakkisan.com" and "Villages Online" portals of Pakistan, The "Grameen Bank's Village Communication Program" in Bangladesh, Radio-Browsing Program in Bhutan, "Penang E-learning Community" in Malaysia and "Interactive Radio" and the " Kothamale Community Radio" in Sri Lanka are all trend-setter projects in South Asia .The pilot projects of " Warna Wired Villages" in

Kolhapur, Sangli districts of Maharastra, "Gyandoot" intranet project in Dhar District in M.P. and "Info Villages" in Pondicherry, Infothela Mobile Telecentre of IIT Kanpur, Community Radio in Andhra Pradesh, Drishti.com in Haryana, U.P. and Bihar and many more such rural initiatives in India have successfully demonstrated the acceptability and usage of high-end information and communication connectivity at village level.

National Institute of Agricultural Extension Management (MANAGE), Hyderabad, India has taken up a number of innovative projects to provide information and communication connectivity to the farmers and farm families in rural areas, under the banner of "Cyber Extension". These projects include: i) Connecting over 25 Districts, 400 Blocks on Internet; ii) Implementing Wireless in Local Loop Technology in Agriculture to provide Telephone and Internet connectivity to rural population; iii) Connecting over 40 national level institutions on two-way Video Conferencing: and iv) Providing Video Conferencing access to Farmers' groups and Farm-families in Rural Areas through its Mobile V-SAT Van. MANAGE is thus very consciously involved in consolidating the learning from all the ICT initiatives in India and abroad, and grounding pilot projects to test the economics and the logistics involved in this Projects.

The ICT enabled Extension or Cyber Extension is not the replacement of existing face-to-face extension mechanism, it is only a supplement to make the existing mechanisms more effectives efficient and economical. The ICTs can help the agriculture extension, more dynamic instrument of continuous 2-way dialogue with the farmers, on various issues, including agricultural marketing and other forward linkages. A lot has been done to test and validate this hypothesis in the Asian continent and the indications are extremely positive that ICTs can support extension in a big way. These experiences have been narrated in the paper along with the lessons learnt.

5. Prospective Extension Methodologies for Improving Agricultural Productivity and Rural Livelihood (Dr. M. Kalim Qamar and Dr. Ansar Ali Khan)

1) Background

a) Concept clarification (strategies vis-à-vis methodologies)
b) Main extension methodologies used during the last few years (Training & Visit system; Farmer Field School, and strengths and weaknesses of each)

2) Rationale for developing location-specific methodologies

a) Serious lack of location-specific extension methodologies;
b) Problems in applying imported models;
c) One methodology is not suitable for all situations due to situational differences; and
d) Objective of extension methodologies (to impart skills and knowledge to target groups with very low literacy level, in order to develop their human and technical capability and capacity).

3) Guidelines for the development of original location-specific methodologies

a) Collection of data for determining the situation context (Size and profile of general audience; Profile of the area; Profile of specific target clientele; Availability of trained personnel; Availability of time and human and financial resources; Availability and commitment of extension services and farm inputs supply agencies; linkages among relevant stake holders); and
b) Features to be incorporated in an extension methodology (Not in contrast to cultural, social and religious values; in line with the context of the area; simplicity, i.e. not too complex to follow; client-focused; participatory; practical, i.e. not theoretical and as close to real life as possible; gender-sensitive; non-formal approach, i.e. through use of facilitators; to be applied in field situation; inexpensive; economic in terms of time/duration; flexibility for accommodating minor changes in the situation; built on the indigenous non-formal teaching/learning traditions; developed in collaboration with potential target groups to ensure continued interest and ownership, which enhance motivation and learning).

4) Field-testing of new methodology

To be done with full involvement of the target groups, in the field situation.

5) Application of new methodology

a) The considerations in applying new methodologies will include:
b) How should the target population be organized;
c) What audio-visual materials should be developed and used;
d) Any pre-requisites for applying the methodology?

e) Any material and non-material incentives involved? and
f) Main positive and negative features of main extension methodologies used in the particular situation in the past and any positive and/or negative impressions of the population about the past methodologies.

6) Training of extension staff in applying new methodology

Training sessions to be organized for the extension staff in the use of both methodology and the materials, preferably in field situations.

7) Monitoring, evaluation and impact assessment of the methodology

To ensure the continued validity of the methodology for the benefit of the target groups and the subjects, which are being taught to the target groups; For Follow-up and for making adjustments in the methodology as deemed necessary.

8) Conclusions

There is a serious lack of original, location-specific extension methodologies in view of the fact that just two methodologies, which were developed elsewhere, have been followed. No single extension methodology is suitable for all situations, and that is why one or more location-specific extension methodologies may be needed for a situation. FAO will be focusing on developing new extension methodologies during 2004-05 and invites the participants of the seminar to collaborate in the exercise by contributing location-specific prototype methodologies, which have been prepared keeping in mind the features mentioned in this brief.

6. Participatory Extension - An Approach for Innovative Agricultural Development

(Mr. M. Tahir Waqar)

The paper consisted of 3 parts namely: 1) Introduction to National Rural Support Program (NRSP) of Pakistan; 2) NRSP's role in extension work; and 3) SPEP Project.

1) Introduction to NRSP

The paper first introduced the Aga Khan Rural Support Program (AKRSP) in Pakistan. The program commenced its activities in 1982. At present it is operating in 5 districts of Northern Areas and one district of North Western Frontier Province (NWFP). The *objective* of the program is: "To foster a countrywide network of grassroots level organizations to enable rural communities to plan, implement and manage developmental activities and programs for the purpose of ensuring productive employment, alleviation of poverty and improvement in the quality of life." The *strategy* is: "To harness people's potential to help themselves." While the approach is: "The people need social guidance to harness their potential.

Salient Features of NRSP

a) Fully home grown;
b) Government of Pakistan becomes a donor;
c) NRSP creates an endowment fund;
d) NRSP maintains its full autonomy and independence;
e) NRSP has no pre-conceived package of delivery of services or supplies;
f) NRSP is non-political, non-controversial, non-agitational and non-partisan;
g) NRSP attempts to reach 38 million poor of Pakistan by persuading Government to allocate resources to set up support organizations. e.g PRSP, GBDO;
h) NRSP does not overlap or set up parallel organizations where support organizations exist. Rather it supports and strengthens such NGOs in their effort to foster a framework of village based NGOs (CBOs) or grassroots institutions; and
i) Works on a national level.

The NRS has undertaken the following step for social mobilization in Pakistan: social mobilization, preparation of poverty profile, formation of local NGO (CBO) and preparation of portfolio of opportunities.

2) NRSP and Participatory Extension

- Recognition that rural people are the owners of their own development
- Helping people think about their own problems and find appropriate solutions (Situation Analysis)
- Resource Constraints Analysis (Household, Group, Village)
- Gender perspective
- Role of facilitator for exchange of ideas and information between stakeholders

The participatory extension of NRSP consists of flow of information from: ***farmer to farmer*** **(**Exchange visits, case studies, training / workshops), ***farmer - research institutes – farmer*** **(**Research according to farmer needs; Education according to farmer needs; Transfer of technology, Exchange visits, training and workshops), ***farmer - market – farmer*** **(**Collective supply of inputs, collective marketing of outputs, market information), and ***farmer - line departments – farmer*** **(**CO platform to link up with line departments, Trained activists linked with line departments, Projects undertaken by line departments through CO, and Agricultural Extension, OFWM, Livestock department., Soil and water, Fisheries, Forest Department, Agricultural Engineering, etc.

The NRSP provides the required inputs like skills, education, information, credit, infrastructure, technology and linkages. Also the NRSP disperses credit to marginalized resource paper farmers, undertakes community physical infrastructure development schemes, imparts trainings for HRD, and loans for input produce, etc. The program has conducted several thousand trainings and workshops to promote participatory extension. The NRSP was trying to enhance participation and empowerment of all stakeholders including women.

3) Sugar Productivity Enhancement Project (SPEP)

The SPEP was introduced in the Rahim Yar Khan district.

SPEP Target Area

a) The cane supply potential area determines boundary of our region
b) 19 Union Councils (Ucs) in all Tehsils of Rahim Yar Khan (8 UCs) & Sadiq Abad (10 UCs) as well as one UC of Rojhan (Rajan Pur)
c) Population of 40,000 households in the project area

Initial Problem Scenario included: Low output due to less irrigation water, not proper use of fertilizer and not adopting modern practices; Delayed payment by Sugar Mills, Problems in marketing of cane, Growers were discouraged to grow cane, and Failure of cotton made situation worse.

Objectives of SPEP are to: Increase yield per acre of small farmers, Ensure marketability of crop, Reduce cost of production, Introduce mechanization and, Ensure profitability.

Project Implementation Network: It consists of NRSP, JK Agri Solutions Limited / Line Departments, and JDW Sugar Mills Limited. The paper discusses the responsibilities of each partner.

Process & Activities:

a) Small farmers in the supply area of the Sugar Mills are organized into COs.
b) Farmers are given guidance and support in improving their crop production. Major focus remains on sugarcane, while farmers also get help in other crops as companion cropping and livestock.
c) Facilitation of small farmers in supply of sugarcane to JDW Sugar Mills and ensuring early payment to growers.
d) Motivation for generation of savings
e) Provision of micro credit
f) Training of CO members in sugarcane and other crop technologies and CMST
g) Provision of sugarcane seed on credit to farmers through JDW Sugar Mills (Installments / In Kind)
h) Provision of agriculture machinery (sugarcane specific) and Peter engines for lift irrigation on subsidy as well as on credit by Sugar Mills
i) Provision of pesticides / insecticides etc on credit
j) Bio technology adoption for controlling pest in farmer's field
k) Development of road network through cess fund, district Gov't and other development projects, after consultations / need identification with CO members
l) Development of other physical infrastructure e.g. watercourses, turbines etc through PPAF
m) Facilitation of farmer in getting indents for supply of sugarcane to sugar mills
n) Recovery of the credit at the supply of sugarcane
o) Facilitation of farmers in getting early payment from JDW Sugar Mills

Achievements:

a) Constitution of RO, Restructuring of FUs and Reorganization of program during last year
b) More than 290 COs with a membership of nearly 4000 farmers
c) CO members have Cane Area of nearly 10,500 acres.
d) A credit of 56 million during 2003 season in SPEP to 3,200 growers with average of Rs. 17,516 per member (Max 25,000)

COUNTRY PAPERS

Bangladesh

Agriculture is the main occupation of the people employing about 70% of the labor force and contributing 32% of the GDP. In the past Department of Agricultural Extension (DAE) tried a number of approaches but they were not always properly organized and often weak. Systematic development was absent until the introduction of T&V system in 1978. The T&V system was a success story to start with but unfortunately failed to develop fully as an ideal communication linkage desirable to our farming community.

The DAE's mission in Bangladesh "is to provide efficient and effective needs-based extension services to all categories of farmers to enable them to optimize their use of resources in order to promote sustainable agricultural and socio-economic development."

To strengthen the Agricultural Extension the Govt. of Bangladesh adopted a New Agricultural Extension Policy (NAEP) in the year 1996 with the objective to attain self sufficiency in food grain, ensure sustainable agricultural growth, increase per hectare rice output, improve the quality and availability of seeds, reduce environmental degradation, increase fish livestock forestry production and increase and develop forest resource.

At present the NAEP incorporates the component for enhancement of agricultural extension, they are: extension support to all categories of farmer, efficient extension services, decentralization, demand lead extension, working with all kinds of groups, strengthen extension research linkage, training of extension personnel, integrated extension support to farmer, co-ordinate extension activities and integrated environmental support.

Besides DAE, other government and non-government organizations providing extension service with their own extension activities are: Department of Livestock (DLS), Department of Fisheries (DoF), BARC and other NGOs. The methodologies used to disseminate the extension message to the farming community are: program planning, demonstration and field day, farmers training, farm walks, meeting, farmers field school (FFS), use of mass media and farmers exchange program.

Bangladesh has made significant gains in Agricultural development, doubling food grains production and obtaining food self-sufficiency in recent year (1999-2001). This has been largely due to improved productivity as a result the use of better seed and fertilizer management, expansion of irrigated area and also due to effective agricultural extension service. IPM Farmer's Field School (FFS) is another achievement of DAE system.

DAE remains committed to the revised extension approach as the basis for services delivery to achieve the following specific objectives 2006: increase agricultural productivity, provide pro-poor service, strengthen partnership and links with local government, develop DAE as an effective institution to provide quality and quantity services, and develop performance measurement indicators.

India (1)

The extension systems in India have contributed for attaining self-sufficiency in food production and allied sectors. The first planned effort was launching of country wide Community Development Program (1952) closely followed by National Extension Service (1953). Thereafter location specific extension programs were planned and implemented namely; Intensive Agricultural District Program (1960), Intensive Agricultural Area program (1964), High Yielding Variety Program (1966) and Farmers Training Centers (1967) contributing for "Green Revolution" in India.

Majority of modern technologies were high cost and not scale neutral the benefits were mostly derived by resource farmers but not the low resource base farmers. In the process the gap between them widened necessitating corrective programs. The SFDA (1969), MFAL (1969), DRDA (1976), IRDP (1978) and LLP (1979) were introduced to assist low resource base farmers to take advantage of modern technology. Although these extension programs were able to achieve improvement in the socio-economic conditions of some of these families, they could not cover all such families.

In order to bring about better research extension linkage and efficient extension system, 'T' and 'V' system (1974), Watershed Development Program (1984) in rainfed areas Transfer of Technology (TOT) programs as well as by State Agricultural Universities (SAUs) were introduced. During late 90s many NGOs as well as input, financial, commodity boards and off late private extension services have also contributed for increased food production. The country was able to realize a record food production of 205 million tonnes by 2000 from meager 50 million tonnes during 1950s.

With all the aforesaid efforts, the extent of adoption of farm technology revolved around 30 per cent as reported by Desai and Reddy (1989). One of the important reasons identified was inadequate

appropriateness of the technology generated from the research system. In order to fulfill this gap, the Indian Council of Agricultural Research (ICAR) launched Technology Assessment and Refinement Project- Institute Village Link Project (TARP-IVLP) during 1995 in 78 centers. The project contemplated to assess and refine the technology for different production systems by involving stakeholders. The project implemented at Malali in Hassan district of Karnataka resulted in enlisting basket of technology and refinement of some technology relevant to different production systems. The improved ragi (finger millet) varieties, compromised spacing in ragi, integrated nutrition management and integrated pest management in potato, horse gram as second crop after potato matching with rainfall period were accepted and adopted by all potential farmers realizing increased net income and also started spreading horizontally across the zone. But the major gap identified was inadequate linkage with all the TOT units of the zone for deriving fuller benefits of appropriate technology generated through this approach.

The future extension thrust should be on marketing extension, farmwomen empowerment, facilitating formation of low resource base farmer's groups, private extension services and environmental extension for sustainability in farming. The research in extension needs to generate data on farming system, cost effectiveness of extension methods, accountability and extension federation for effective functioning of extension systems.

India (2)

In India, farmers are supported with many sources of extension services. Extension services are offered by Government through institutes, directorate, research centers and other sources like input companies, NGOs, agro-processors, farmers associations, cooperatives and private consultants. Effective dissemination of research results through extension is evident from the food sufficiency achieved as a result of increased agricultural production in the country.

Networking of important Govt. departments with agricultural universities and apex institutes like Indian Council of Agricultural Research is instrumental in disseminating and supporting farming communities with improved production technologies. Effective linkage of research and extension, monitoring and evaluation and documentation of indigenous knowledge are important features of the system.

In order to increase effectiveness of the AES for community challenges like appropriate technologies, technology transfer models and linkage with all stakeholders including women needs to be tackled.

Non Governmental Organizations (NGOs) through their network of extension have been playing crucial role in disseminating location-specific innovative technologies for rural areas. BAIF and other NGOs working in rural development field have been supporting AES in India.

Indonesia

Agricultural Extension system (AES) has been implemented in Indonesia for the last 93 years. Since then AES has been continuously developing. Chronologically it can be categorized as colonization era 1817-1945, independence era 1945-1999, and transition era from 1999 to present and subsequently the period is called agricultural extension system on decentralization era (AESD).

AES on this era has also basically changed on its concepts both operational and institutional, polarization on the implementation of the role of IT extension. Contrary to the top down approach of traditional AES, the decentralization era approach is the bottom up system. Consequently the operational work of the AES of T & V has been shifted from top down system, to system that meet the societal needs of the community. This system aims to improve income generation and prosperity of farmers and business actors in agribusiness sector.

AESD can be classified into institution of agricultural extension, research institution, education institution, training institution, agribusiness institution, and farmers' local organization. Each of these institutions has functional relations to each other. In addition, on the side of it operational these institutions adopt equal partnerships, openness, mutually beneficial and dependent as well. The paper discusses the classification of the agricultural extension management in Indonesia

Monitoring and evaluation of agricultural extension is conducted at each of administration level. In addition, to secure the public accountability and transparency, it is necessary to involve all stakeholders of agricultural extension such as farmers, extension agents, and agribusiness actors. The AES in Indonesia is complex currently and the transition era, and it needs in ideal adjustment that fit to each of the region conditions or local characteristics.

Islamic Republic of Iran

Agriculture is an important component of the Iranian economy, contributing to 27 percent of GDP, 23.8 percent of employment opportunities, 82 percent of food supply and 35 percent of non-oil exports as well as in provision of considerable raw materials of industrial use. Due to the important status of agriculture in the country economy, an effective extension system is needed to support the farming community. This system would not be efficient unless to develop the capability to change in relation to its environment. Hence, extension system should be reoriented to meet the emerging needs and requirements of farmers. Enhancing extension system is a paramount strategy in agricultural development agenda in Iran as it plays a major role in the improvement of farming systems' productivity. In order to be effective in the process of agricultural development, the national extension system has to enhance its structure and functions. In this regards, the government has formulated many strategies, of which the followings are more important: structural adjustment in the extension system, establishing National Extension Network (NEN), applying information technology in extension processes, improving communication process, placing emphasis on the participation of farmers, empowerment of rural women, training of extension personnel, vocational and technical training of rural youth, supporting privatized agricultural extension, improving the role of extension in sustainable agriculture, involving research institutes in extension activities, enhancing the role of female extension workers in the national extension system, mobilizing agricultural graduates to assist the extension system under Construction Soldiers Plan, improving farmers' knowledge through selecting and introducing model farmers (Farmer-to-Farmer Extension), reorganizing and supporting local extension workers. It is obvious that agriculture requires a more flexible system of delivering information and technological innovations. If extension system intends to play a decisive role in agricultural development it should be restructured and become pluralistic in nature.

However, taking the socio-economic changes into consideration, the following recommendations are proposed by the author to enhance the extension system in Iran: 1) New concepts like cyber extension should dominate the extension scenario in the future; 2) Proper information management system and database should be developed for each farming system in the country; 3) In order to improve the efficiency of extension services, continuous training of extension agents and evaluation of the impact of training should receive a high priority; 4) Community-based organizations and Self Help Groups (SHGs) should be more popularized in different parts of the country and play significant role in agriculture; 5) Institutional pluralism in extension should be more focused to cope with the chronic problems of public extension system; 6) More emphasis should be placed on participatory approaches to agricultural extension and development; 7) Human Resources Development (HRD) should be given due importance in different sections of extension system; 8) A decision support system to support farmers in the process of decision-making should be developed; 10) Along with public extension system, due importance should be given to the specialized and privatized extension system.

Lao PDR

With more than 80 percent of Lao's population employed in agriculture, it is of the utmost importance, to ensure that the country and its farming community are aware of and informed on recent technological advancements in farming methods. With a large majority of the farming population living in remote rural areas this is not always an easy task. It is therefore the responsibility of the Extension Office of Lao, by acting as the linking body between government institutions and the farming community to ensure the successful dissemination of information. Frequently the Extension Office must also tailor the new exotic technologies to adapt them to the specific climate and culture of Lao. Thus, it is the Agriculture and Forestry Extension Office's primary endeavor to provide relevant education and appropriate training to the farmers of Lao, and ensure the growth, utilization, and sustainability of agricultural advancements.

The Agriculture and Forestry Extension Service of Vientiane City was formed in 1991 as a branch of the Ministry of Agriculture and Forestry and since has reported to the Department of Agriculture and Forestry for Vientiane Municipality, and the Minister of Agriculture. In 1995, the Extension Service was divided into four sections each with its own focus and objectives. A pilot project was initiated in 1996.

The extension services of Lao rely strongly on a combination of fieldwork, office preparation, in-field training, and publications. The strongest concentration of extension work occurs in the field between the extension worker and the farmer.

The enhancement of the extension services in Lao will require a high priority assigned to extension services, and provision of trained and experienced manpower. Along with a stronger focus on extension activities the procedures of implementing the extension methodologies must be improved.

Currently there is little preparatory or follow up activities and the training given to the farmers becomes simply promotion of new technology or farming method. Finally, and most importantly, the Extension Office must increase the technical capacities and experience of its staff, so that the staff can play a more active role in improving agricultural extension services.

Mongolia

Agricultural extension services have introduced instituting the agricultural policy reform in Mongolia. National Agricultural Extension Center was established by the Government, under Ministry of Food and Agriculture, in November, 1996.

The main objectives of the Center are to: a) provide with technical and business advice to food producers, herders, crop producers, and assist them through advice on the beneficial running of their farm business, and b) provide regular updated /new information to producers. The center is disseminating traditional technologies and research achievements to producers and providing them with advice and support on development of the projects and business planning to expand and intensify their business activities and transferring technologies. Thus, the Agricultural Extension Center is acting as a main lever to assist less-experienced agricultural producers and farmers in expanding their production, improving their income and raising living standard.

The Center is governmental organization with 10 staffs at the headquarter which is located in Ulaanbaatar. About 50 voluntary researchers are working as part time extension workers in different areas of the agriculture sector. While the aimag office (province) consists of one formal extension worker and 6-7 part time advisors.

During 5 years since it was established, 54701 producers /food and crop producers, herders/ and 809 entities attended 449 trainings and workshops, conducted by the Agricultural Extension Center. The Center has provided technical advice to 13481 producers and 363 kinds of information distributed as well as 14 TV programs and 83 radio programs, 10 publications to newspapers. The Center has distributed 10 booklets, 80 brochures, leaflets, and instructions for producers and also organized 6 demonstrations and field day.

Main issues/problems in enhancing AES of Mongolia are: lack of trained and experienced manpower, distant location of farming communities, preponderance of nomadic agriculture, lack of basic infrastructure to name a few.

Nepal

Agriculture in Nepal is the main sector to contribute to national economy. Around 70 percent of the population in Nepal depends on agriculture for their livelihood. There is no other way to develop the Nation without developing agriculture. Agriculture extension system adopted in the country has to play a vital role to uplift farmer's status and eventually country's economic level. In this context, it will not be exaggeration to say that extension system should appropriate-ly address the issues and concerns appeared in the process of agriculture development.

Agriculture Prospective Plan (APP), which is a main document for agriculture, has stressed the need of growing high value crops. Accordingly, the plans and programs are being formulated and implemented in the country. Several extension approaches like T & V system, Integrated Rural Development (IRD) approach, Tuki system, Farming Systems based Research and Extension (FSRE) system, and Block Production Program etc. with the support of funding agencies were tried in the past. It is seen quite often that as the projects get completed activities are also minimized. This obviously indicates the problem of sustainability after the donor support. Rather farmers get confused due to the differences in implementation models and approaches.

Recently, Commodity Group Approach is in operation. Similarly, Farmer's Field School, which is a training method of Integrated Pest Management Program (IPMP), is becoming effective in involving farmers. Farmers are found to appreciate both of these approaches. Efforts have been made to modernize extension services by adopting pluralism, decentralization, projectization, etc. Coordination and linkages among the concerned stakeholders have been substantially improved.

The following shortcomings in extension system still exist: limited access to improved seeds and other inputs, limited availability of quality extension services, limited road network, limited marketing opportunities for perishable cash crops, insufficient participatory process, poor and disadvantaged people not well accommodated in the program, low technical competencies in staff, and less involvement of private sector and NGOs.

For overall improvement of the system, the following considerations should be made: strengthen farmer groups, compare accessibility of resources, change in the role of extension, rural problem to be analyzed within the framework of agricultural development, improvement in technical support and input supply system, adoption of pragmatic approach, and promotion of marketing extension.

Agriculture is a complex enterprise in which concerned stakeholders are to be involved. There are many units within research and extension organizations working for agriculture development. A functional coordination should therefore be established within these units. Farmers being the main actor among the stakeholders should be focused in the whole agriculture development system.

Pakistan

The extension work in Pakistan started in 1902. The College of Agriculture and Research Institute, Layllpur was established in 1906. After participation many Community Developments and Extension projects and programs were tested. Some of these include: Village-Aid, Basic Democracies System (BDS), Integrated Rural Development Programme (IRDP), Training and Visit (T&V) and Extension Field Schools (EFS), Agri. Extension has been decentralized as a result of Devolution Plan 2001.

The extension still remains top-down, less efficient, large-scale and male farmer orientated. It still ignores women and youth as partners. There is a dire need to develop close linkages of Agriculture Universities, Agriculture Extension, Agriculture Research, and farming communities to strengthen the Agriculture Knowledge and Information System (AKIS). The University of Agriculture, Faisalabad needs to have its own out-reach area where students and faculty may practice the theoretical knowledge learnt. The postgraduate students may conduct research in the out-reach area based on the needs of the farmers.

Philippines

The growth and development of agricultural extension in the Philippines has always been associated with government reorganization. It had undergone dramatic changes at different regimes. In 1991, the Local Government Code mandated the devolution of the agricultural extension services to Local Government Units (LGUs). Extension service, which is a basic requirement to effect societal change especially among the disadvantaged sector is now the responsibility of LGUs. More recently, some research and development institutions were mandated to do extension work such as Philippine Rice Research Institute, Bureau of Post Harvest Research and Extension, and the Philippine Carabao Center.

There are five major players of agricultural extension systems in the Philippines. These are a) bureau and attached agencies of the Department of Agriculture, b) local government units of the Department of Interior and Local Government, c) state colleges and universities of the Commission of Higher Education, d) some non-governmental organization and e) some private agri-business companies. The heterogeneity of extension users requires varied appropriate extension approaches. The Techno Gabay Program is being implemented to develop, validate and promote an effective mechanism for R and D utilization. Its rationale is to complement the LGUs and Rural Based Organization (RBOs) efforts in providing information delivery and technology services, and strengthen the link among the technology generators, technology services and technology adopters. It is participative, with the clientele viewed as the implementers, and the different government units as facilitators.

Agricultural extension in the Philippines is provided to different kinds of farmers by many agencies of the government and by the private agri-business companies and some NGOs. The major problem of agricultural extension in the Philippines is the lack of a coherent national policy on agricultural extension that embodies and guides all the agricultural extension efforts of the country. Other problems are: isolation and poor complementation, partnership and cooperation between Department of Agriculture (DA) agencies with Research and Development functions and the LGUs which are conducting general agricultural extension in 41, 940 barangays of the country with around 12 million people. The key solution to these interrelated problems of Philippine agricultural extension is a legislation that will put into the law of the land pluralistic policy of agricultural extension making extension in the Philippines as a “Pluralistic Agricultural Extension System”.

Sri Lanka

Sri Lanka embarked on a program of devolution of power to provinces in the year of 1988. Agricultural and Livestock extension were devolved on to the provinces. Apart from the Central Ministries, Provincial Ministries were established to cater for farmers more independently. Under the Provincial

Ministries of Agriculture, Provincial Departments of Agriculture (PDOA) and the Provincial Departments of Animal Production and Health (AP&H) were established.

In 1989 Provincial Departments of Agriculture were restructured and their field level extension workers were appointed as *Grama Seva Niladaries* (GSN) and were asked to concentrate on administrative functions. Due to the inadequacy of field staff of PDOAA and the cost effectiveness of the extension approach (Training and Visits System) the gap between extension workers and farmers has been widened.

Since 1992, the World Bank Assisted Second Agricultural Extension Project (SAEP) commenced its activities in Provincial Councils and also in inter provincial irrigation schemes still vested with the Central Government. PDOA, AP&H, Coconut Cultivation Board (CCB) and the Department of Export Agriculture (DEP) became the implementing agencies of the project and they were having their own organizational structures. SAEP followed the philosophy of agricultural development in a more of participatory manner. Problem Census and Problem Solving (PCPS) was the key tool applied by extension workers to design an Integrated Agricultural Extension Program (IAEP) where all the implementing agencies were involved in the implementation of the program. After several years of operation the experiences showed that the collaborative work did not materialize the desired outcome of the project. As an extension strategy Participatory Technology Development (PTD) has shown positive results in the North Western Province of Sri Lanka where the approach called "Seasonal Cycle" is highly appreciated by extension workers.

Currently different organizations are involved in extension, but the degree of the contribution of each organization to the development is varying. According to the recent policy statement of agriculture and livestock of Sri Lanka accepts the situation that the agricultural and livestock services have become weak and they needs improvement.

For the enhancement of agricultural extension systems of the country, a number of avenues can be considered. Structural changes of the existing organizations, establishment of an umbrella organization to represent such organizations, mobilization of extension services, strategy formulation for introduction of new technology are some of them. Apart from the policy decisions to be taken by the higher authorities it may not be a difficult task to improve the working capacity of the extension organizations. Specific extension approach, well designed extension programs, effective monitoring and evaluation mechanism, proper human resources development program are some of the crucial factors that can be improved with the available resources of most of the extension organizations.

Thailand

Thailand is an agricultural country. The government has actually set up the goal promoting Thailand as "Kitchen of the World". Thus, the agricultural extension is still very important in the country. The percentage of population engaged in agricultural sector is going down, However, Thailand can produce the agricultural production up to 1 million baht per year. However, ten million of population is under poverty line (922 baht/head/month), and most of them are farmers. This is a challenge for the government to push their incomes up to 1667 baht/head/month by 2006. Many agricultural extension projects have been a success, e.g. increasing jasmine rice production, increasing soybean production, and fruit and agro-processing for export. These success stories happened due to strong political commitment of the government. Moreover, organizations such as DOAE, DOA, BAAC and agri-business sector have successfully implemented many projects. NGOs are also involved in providing agricultural extension services. For example, the Population and Community Development Association (PDA) of Thailand has continuously operated various agricultural production programs. The Shy Irrigation project is the most popular in Northeast Thailand. The project focuses on promoting farmers participation in whole process. Thereafter, the farmers' groups have to manage the system by themselves. Certainly, various agricultural extension methodologies have been used.

Other organizations like GOs, academic institutions and private sector are involved. Importantly, the business sector has participated and get involved in agricultural extension in terms of providing business skill technologies, marketing and financial supports. However, AES of Thailand is facing the challenges of government policies, extension methodologies, research and development on extension including business and ICT skills of extension workers for its further enhancement.

FIELD VISITS

The participants visited the University of Agriculture Faisalabad (UAF) campus and the United Farms of Agriculture and Dairies.

1. UAF Campus

During their visit of the UAF campus participants were able to observe laboratories, Main Library, Computer Science Department and Greenhouse facilities. They visited laboratories of Botany, Zoology, Horticulture and Agri-Entomology as well as the High-Tech Lab. All labs were well equipped and undertaking both basic and applied agricultural research. The main library had large collection of books, all sorts of Audio-Visual Aids and Internet facilities for the students. The computer science department had excellent computer facilities. The greenhouse was to grow cut flowers especially roses for commercial purpose and had a laboratory for extraction of essential oils. The participants very much appreciated the standard of research and teaching facilities at the UAF.

2. The United Farms of Agriculture and Dairies

The participants visited The United Farms of Agriculture and Dairies. Ch. Rehmat Ali, Managing Director, and his colleagues welcomed the participants.

The farm is a good example of the informal cooperative farming with a total area of 800 acres and 10 members. Total labor force is 1500 consisting of 1000 female workers and 500 male workers. At the farm diversified farming is practiced. They were using the modern agro-practices. The farm produces vegetables (potato, okra, peas, chilies, bitter gourd) and crops (sugarcane, wheat, cotton) as well as raises 300 (300 buffalo and cow). The farm is well maintained, and productivity of both crops and livestock was quite high. However, the farmers were not satisfied with the extension services provided by the public sector.

The participants visited the potato seed production farm spreading over 70 acres. They were multiplying the seed produced using tissue culture technique. The potato was bumper. However, farmers told that main challenge was high fluctuations in the price of potato seed over years (PKR 5000 to PKR 50000) due to large variations in the market demand.

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 in enhancing agricultural extension systems in member countries, particularly in light of the changing environment resulting from the increasing trade liberalization and globalization trend and mounting concern for food security and sustainable development?*
2) *What strategies/measures could you suggest to effectively address these issues/ problems.*

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**: Theme: Policy, Planning and Development Issues/Problems:**

1. Composition of the Group:

Chairperson	Dr. K.N. Gowda (India)
Rappoteur	Dr. H.S. Fami (Iran)
Facilitators	Dr. M. Kalim Qamar - Resource Person (FAO Rome) Dr. Andrew P. Davidson – Resource Person (Australia)
Members:	M. H. Rahman (Bangladesh) M.H.Jamil (Indonesia) Ms. T.Jamtsaa (Mongolia) Dr. Munir Ahmad (Pakistan) T.M. Aganon (Philippines) P.Wadduwage (Sri Lanka)

Observers D. M. Abbasi
Shahid Iqbal (Ph.D. Student)
Ijaz Ashraf (Lecturer)
Nisar Hussain (Lecturer)
M. Tariq (Ph.D. Student)

2. List of Issues/Problems:

1. Financial support for strengthening extension projects;
2. Accountability in extension work;
3. Incentives and reward system;
4. Political interference;
5. Environmental extension service;
6. Integrated multidisciplinary and holistic development ;
7. Awareness on globalization and WTO;
8. Advisory systems;
9. Information management system;
10. Community organization;
11. Participatory approach in extension work;
12. Documentation of Indigenous knowledge;
13. Synchronization of provision of technical and input support;
14. Media support;
15. Manpower requirement for extension;
16. Support of donors / National and international;
17. Participatory technology development;
18. Government subsidy to promote agricultural extension services;
19. Long term, medium term and short term planning consideration;
20. Extension research agenda; and
21. Cultural sensitivity.

The group discussed, in detail, the following 11 issues:

	Issue/Problems	Strategy	Proposed Action	Perceived Agency/Organization	Time Frame
1.	National Extension Policy - No NAEP - Less defined NAEP	Involve all the stake holders - every country to have well defined LT.MT and ST NEP	Establish a national body to develop NEP	FAO/APO/NPO/ countries government/ Research organizations AUS representatives	One year
2	Cyber Extension - Lack/inadequate Cyber Extension network to access for latest & timely information	Establishing networking at all levels	Connect all the Extension Units / Centers with the network - provide hard and soft wares - train them to maintain the system	Bilateral and multi-lateral agency support/ NRO/ SAUS/ FAO to support funds	3-4 years
3	Extension Organization - Weak Organizational structure - Lack/inadequate job chart - Post WTO, globalization liberalization demands strong extension structure.	Modifying the existing organization structure, job. Description in terms of responsibility and authority, accountability	Establish national and regional forums to discuss, debate and reorient consensus on organization structure, job chart, accountability	The concerned Ministry along with regional authorities , NARS, SAUS, NPO, APO, FAO to support pilot projects	2 years
4	Institution linkages - Weak linkages - No linkage at Federal provincial levels	Inter/Intra Departmental linkages with all concerned stakeholders at national and provincial levels	Constitution of committees at respective levels with clarity in authority	All stakeholders	One year

5	Human Resource Development - No/inadequate training institutes - No/inadequate TOT	Capacity building of extension personnel at different levels	Establishing and strengthening training institutes at various levels for both pre-service and in-service training	Concerned ministries with the donor agencies, NRO, SAUs with the support from FAO/WB,AB,UNDP	4-5 years
6.	Empowerment - Rural Women - Rural Youth - Tribal - SF & MF - Nomadic	Participation Capacity-building	- Education - Provision at Supportive Services - Dissemination of ITK - Establishing Self-help Groups	PSES, NGOs, PAES with the support of international agencies	Continu-ous
7.	Documentation and Monitoring & Evaluation - Absence / inadequacy	- Impact assessment - Participatory evaluation and monitoring - Process documentation - Institutionalism of extension documentation of national and provincial levels	- Setting up a reliable database - Training extension workers in research methodologies - Training extension workers in PRA techniques - Establishing a process documentation unit - Publishing national and international journal on documentation of extension processes (Extension processes in Asian countries)	Research organizations with the support of PSES, NGOs, PAES and international agencies	Ongoing
8.	Agricultural Education/Curriculum Revision - less relevant	Revision of formal extension curriculum in the contexts of globalization/liberalization and post WTO	Courses to be included in the curriculum in line with globalization and emerging challenges	SAUs with stakeholders	Three-five years once
9.	Marketing Extension - lack of marketing policy - lack of marketing information technologies - lack of training of marketing techniques	Promoting marketing technologies by extension organization in close collaboration with concerned ministries/organizations	- National/regional and local extension marketing database information unit - Training of extension workers on the marketing technologies - Facilitating marketing extension works - Promoting - entrepreneurship	PSES, NGOs, PAES with the support of international agencies	Continu-ous
10.	Decentralization - top down - bureaucracy - political inferences	Identification of roles and responsibilities with authority at various levels - move power and authority to technocrats	Empower all the executives and others through training - more autonomy to technocrats	PSES, NGOs, PAES with the support of Ministries at provincial and national levels	1-2
11.	Institutional pluralism - lack of roles and responsibilities - lack of control mechanism	Facilitating NGOs, FOs, CBOs, PAES by PSES	- Extension networking - Training of all the concerned - On PRA and facilitation skills - Mechanism to control - Specific roles - Coordination - Monitoring	PSES, NGOs, PAES with the support of Ministries at provincial and national levels international agencies	Contin-uous

Group II: **Theme: Program Operation and Implementation:**

1. Composition of the Group:

Chairperson:	Dr. BR Patil – India
Rapporteur:	Ms. MA Tenorio – Philippines
Facilitators:	Dr. VP Sharma – Resource Person (India)
	Dr. Ansar Ali Khan – Resource Person (Pakistan)
Members:	Mr. S. Douantavilay – Lao
	Mr. KC Shrama – Nepal
	Dr. Tanvir Ali – Pakistan
	Mr. K. Taweekul – Thailand
Observers:	Mr. N. Akhtar
	Mr. G. A. Khan
	Mr. A. A. Goraya
	Mr. Naveed Ayyub

The group discussed the following issues in detail, and proposed the strategies as indicated hereunder:

Issue	Strategy	Action	Agencies
1. Capacity Building • Lack of Govt. official knowhow and skills in M+E in extension activities. • Absence of systematic database for planning and policy purpose. • Inadequate professional training and education curriculum of extension practitioners management. • Improper selection of staff . • Midterm training/orientation. • Absence correct policy and carrier path with reward and punishment system. • Accountability for performance efficiency. • Gender issue, non sensitive • Weak women participation	Develop effective HRD policy	• Compile staff profile, identify training needs • Develop mechanism for performance evaluation and reward system for extension staff.. • Encourage and motivate women to actively participate in extension activities like meetings, trainings etc. • Conduct degree/higher and non degree programs, in academic institutes etc. and organize conferences, seminars, workshops etc. on extension and related topics. • Establish database and information center for personnel management • Development of suitable training and education curriculum and revise time to time (tailor made) • Recruit sufficient and capable staff with extension background with support from specific subject matter specialists.	Concerned ministries, departments, academic institutions, NGOs, FAO, APO, etc.
2. Organization and Management • Lack of inter and intra agency coordination. • Inadequate Logistic (budget, materials, transport, communication equipments • Weak linkages with other agencies and organizations. • Dynamic leadership. • Transparency in management system and processes. • No clarity of mission, vision, goals, roles , function and authority. • Weak governance. • Well-defined organization structure, flow chart with focus on national level.	Develop effective and efficient management and coordination system.	• Establish coordination bodies at various levels (National, Regional, District) with other concerned agencies. • Provide sufficient budget mobility, equipment, communication, etc. on time. • Establish functional Institution linkages at various levels. • Develop dynamic leadership with clarity on mission, vision, goals, role, functions and authority. • Develop well-defined organizational structure, flow chart with the focus on central to field level. • Establish constructive and good governance system with transparency.	Concerned ministries, extension and line departments, NGOs, FOs, Research institutions, SUCs, etc.

3. Sustainable Farmers' Organizations • Inadequate participation of farmers • Inadequate representation of farmers to address problems • No adequate mechanism to extend the outreach to maximum number. of farmers • Weak farmer linkages-processing marketing value addition	Maximize farmers participation and involvement through FOs (conceptualization, plan implementation monitoring and evaluation and marketing.)	• Develop community profile. • Promote FOs at village level, like line User's groups, SUCs etc. • Institutionalize FOs to federation and cooperatives. • Establish linkages between FOs and extension workers to increase the outreach and appropriate decision making. • Develop leadership and management skill of the FOs. • Empower FOs with the marketing and processing skills by training and orientation. • Establish linkages with financial institutions for credit assistance. • Involve maximum women participation. • Promote facilitation to establish linkages for marketing and financial support.	Extension organization, extension workers, Financial institutions, FOs, Cooperatives Federations, and Donors.
4. Extension Research (RDE) • Inadequate extension research methodologies, approaches and technology application • Budgetary constraints for extension research	Incorporate extension research in existing system	• Develop extension research programs to address the field problems, processes, and social aspects. • Develop feedback mechanisms for policy makers, planners, extension workers, and farmers • Allocate sufficient budget for extension research programs.	Ministries, Departments, SUCs, FOs, NGOs, APO, FAO etc.
5. Participatory Monitoring and Evaluation (PME) • No proper inbuilt participatory monitoring and evaluation mechanisms in the system for determining effects and impact • Inadequate skills on PME	Develop and strengthen PME mechanisms	• Establish and improve PME system in the projects as a continuous process • Develop suitable indicators and parameters based on the logframe • Establish databank or MIS to monitor regularly • Develop feedback mechanisms for all agencies and individuals concerned • Train and orient on PME • Make financial provision for PME	Ministries, Departments, Research Institutions, NGOs, SUCs, FOs, etc.
6. Networking • Poor networking to institute between farmers and institutions • Inadequate institutional linkages in bringing research-extension and some missing tasks	Institutionalize networking	• Establish networking institutions at various levels such as regional, national, international, etc. • Establish forum, platforms, or venues for interacting/sharing of information for all the stakeholders regularly. • Develop database of extension workers in working at various levels. • Make a provision for financial support	Concerned line departments, Research Institutions, SCUs, NGOs, International agencies, FOs. etc.
7. Methodologies, approaches, tools, techniques and technologies • Inappropriate technologies, approaches, and strategies • Frequent deviation and inconsistent policies and methodologies • Inadequate consultations with farmers	Develop an effective and efficient extension methodologies and approaches suitable to farmers.	• Carry out field testing and assess the appropriateness of technologies before dissemination • Recognize and address the farmers' priorities • Motivate the farmers for participatory extension and research process.	Concerned Departments, Research Institutions, NGOs, SCUs, FOs, etc.

8. Inadequate Infrastructure and Input Delivery System • Insufficient office space, buildings, equipments and support systems • Inadequate financial support • Untimely delivery of quality and quantity inputs • Inadequate training and demonstration and post-harvest facilities	Provide sufficient logistic support and facilities	• Construct required number of office buildings, provide equipments (computers, audio-visuals, transport etc) and establish sufficient support systems • Make provision of financial support • Manage and assure the timely availability of quality and quantity inputs through FOs, NGOs, and demonstration farms • Establish sufficient number of training, demonstrations and processing units at least one in each district	Concerned Departments, FOs, Donors like FAO, APO etc.

RECOMMENDATIONS

Based on the resource papers and country paper presentations, and intensive discussions and deliberations during the workshop sessions, the participants, made the following recommendations. These recommendations are aimed at making extension systems more effective for agricultural and rural development, for consideration by Member Countries and international organizations:

Recommendations for Member Countries:

1. Formulation of national policy on pluralistic extension with the involvement of stakeholders with an aim to:
   - ***broadening the technical mandate of extension*** to include coverage of topics such as marketing, inputs synchronization and environment
   - ***encouraging bottom-up grassroots extension program planning*** at village level, and to establish a demand-driven, gender-sensitive and holistic extension system.
   - ***involving both public and private institutions including NGOs*** in the planning and delivery of extension services, with the government performing the functions of national policy guidance, coordination among various actors, quality control, resource mobilization, manpower development monitoring, research, evaluation, impact assessment and documentation.
2. Promotion of village-level and community-based organizations of farmers and special interest and vulnerable groups such as women, youth, rural poor, tribal and nomadic people through formation of village-level and community-based extension planning and implementation committees.
3. Establishment of inter-agency/inter-disciplinary coordination, collaboration and linkage mechanisms for promoting joint planning and programming by the AKIS (Agricultural knowledge and information system) actors such as extension, research, education and rural indigenous centers through measures like formation of public and private stakeholders' extension committees ensuring participation of small farmers at all operational levels.
4. Establishing National Association of Extension Specialists to serve as a think tank to ensure development and application of bottom-up policies and plans, need-based skill oriented curricula and operational strategies attractive service conditions for extension personnel and financing of extension programs.
5. Encouragement of financing of extension services not only by the public sector but also by the private sector, NGOs and producer's associations through public private partnerships; separation of the functions of services delivery from the financing and ensuring satisfactory resource mobilization, allocation, disbursement and utilization.
6. Development of an extension human resources management plan aimed at reforming pre-service extension education and in-service training through improvement in curricula and teaching-training methodologies, development of teaching learning materials so as to bring extension education in line with worldwide extension reforms; and inclusion of career development path covering salaries, promotion, and training opportunities for extension professionals at par with specialists in other agricultural disciplines like research and education.
7. Development of situation-specific participatory client-focused and gender-sensitive extension methodologies, research and materials rather than "importing" extension methodologies from elsewhere; and promotion of the use of a combination of several extension methodologies,

development of databases including those involving the application of electronic information technologies in support of extension work (cyber extension).

8. Strengthening of devolved/decentralized extension services through role clarification of decentralized staff, encouragement of grassroots participatory planning, capacity-building of staff, and ensuring that necessary financial and administrative authority is delegated to the decentralized agricultural units to carry out responsibilities of budget allocation, utilization and re-appropriation.
9. Establishment of one-stop Farmers' Advisory-cum-Support Service Centers at village/ community/ cluster of villages, to provide multi and inter-disciplinary advisory services and inputs to the farming community.

Recommendations for APO:

1. Organization of follow-up national workshops/seminars of policy makers to review and update existing national extension systems in the light of recommendations of the regional seminar in order to transform them into bottom-up and decentralized systems with a broad based mission of rural development.
2. Assist Member Countries in the development of needs/problems based teaching-learning and training materials; and organization of training of trainers programs in program planning, implementation, marketing, monitoring, and evaluation and information dissemination.

Recommendations for FAO:

1. Provision of necessary assistance to Member States in collaboration with APO and other donors in:
   a) Conceiving and redesigning new pluralistic broad based national extension systems with a mandate to meet the needs of their entire rural population;
   b) Designing extension policies and developing teams of high level qualified personnel in program development, marketing and implementation strategies including monitoring, evaluation, impact assessment and use of ICT/Cyber technology in extension; and
   c) Establishing networks of extension institutions at regional and sub-regional levels for sharing of knowledge and expertise through electronic media.

Finally, we the participants agree to establish the Asian Association of Agricultural Extension and Education to establish/strengthen national/regional networks of extension professionals/ institutions and request the international organizations such as FAO/APO to solicit their assistance for the association.

1. AGRICULTURAL EXTENSION IN ASIA AND THE PACIFIC: TIME TO REVISIT AND REFORM

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INTRODUCTION

Agricultural extension today is not what it used to be. Extension is passing through a major transformation partly because of its own drawbacks exhibited since its formal inception in developing countries, partly because of policy changes in certain countries, and partly owing to global political and socio-economic developments, that are affecting developing countries. The topic of transformation in extension is as large in scope as the topic of extension itself. In the interest of brevity, however, this paper offers a glimpse of the major causes for transformation and the reforms that are currently going on in different parts of the world. The paper also suggests 15 directions for reforming the national extension systems in Asia.

HOW TRADITIONAL AGRICULTURAL EXTENSION SYSTEMS LOOK LIKE

1. Profile of a Typical Public Extension System

Before going into the causes of change in extension and the specific changes being brought about in extension, a brief look at the traditional public agricultural extension system is necessary to comprehend the context within which the movement for extension reform has emerged. The public extension system that was introduced in developing countries during 1950s, still has, by and large, the following profile, with minor exceptions:

- *Location:* Ministry of Agriculture;
- *Funding source:* Government;
- *Accountability:* To superior officers;
- *Main source of improved technologies:* National agricultural research institutes and research stations;
- *Methods:* Demonstrations, farm visits, individual contacts, home visits, group contacts, mass media, published materials;
- *Institutional structure:* Hierarchy from national to provincial, to district to village level;
- *Target population:* Usually male farmers, with preference for big farmers;
- *Thrust:* Supply-driven; technology-driven;
- *Mandate:* Transfer of improved agricultural technology;
- *Existence of national extension policy:* Rarely, because covered by the national policy on agricultural development;
- *Staff:* Mostly hardworking and dedicated though feels constrained by logistic difficulties and few career development options; product of poor academic programs; most learn on job;
- *Staff status, benefits and career development opportunities as compared to other disciplines:* Very low;
- *Operational funds:* Insufficient;
- *Field mobility facilities:* Extremely limited;
- *Number of farmers and geographical area to be covered by each field agent:* Generally very large;
- *Linkages with research and other institutions:* Notoriously weak;
- *In-service training:* Unsatisfactory and insufficient;
- *Basis for staff rewards and accountability:* Mostly subjective;

- *Any assertive say in ensuring supply of farm inputs to farmers essential for adoption of extension recommendations:* None;
- *Impact assessment of the programs:* Rarely done if any; and
- *Verification of technologies for environment-friendliness:* Never done.

2. General Impression about Public Extension System

- Large number of staff; consuming substantial government budget yet neither too efficient nor too effective;
- Top-down organization and operations;
- Farmers complain because extension agents do not visit them often enough; and
- Low adoption of improved technologies owing to poor extension services.

3. Typical Donor-Driven Projects to Improve Extension System

The World Bank was the biggest donor, which supported the public agricultural extension systems financing projects in developing countries, starting late 1970s. Typical projects, funded mostly through World Bank loans had the following features:

- Provision of increased training, in-country and overseas, to extension staff;
- Temporary increase in the number of extension staff during the life of the project;
- Provision of extra-budgetary operational funds, vehicles and equipment;
- Introduction of extension methodology, Training and Visit (T & V) system, which demands a single chain of command, fortnightly training of extension staff, regular contacts between trained extension agents and contact farmers, and delivery of extension advice as the sole responsibility of extension workers;
- Mandatory periodic meetings between extension and research staff, based on agricultural calendar; and
- Provision of the services of expatriate technical advisors.

4. Main Outcomes of Donor-Driven Efforts

- The importance of extension is recognized internationally due to tremendous resource allocation and long-term support by a major donor;
- It has a positive effects on yields, though there is no sustainability of project interventions;
- Developing countries put under burden of huge loans;
- Disappointment with the extension methodology, T & V system, and an almost immediate acceptance of Farmers Field Schools as alternate methodology due to its participatory feature; and
- Governments and donors more frustrated with the public extension services.

NATIONAL MEASURES DURING 1990s AFFECTING PUBLIC EXTENSION

Certain developing countries, mostly upon the advice of major donors, undertook the following measures:

- Reduction in budget allocation to agriculture sector;
- Complete detachment of extension organization from farm inputs supply;
- Reduction in, or removal of farm subsidies; and
- Substantial downsizing of extension staff under structural adjustment.

WORLDWIDE DEVELOPMENTS PROMPTING REFORMS IN EXTENSION ORGANIZATIONS

Agricultural extension organizations, like most other organizations and institutions, are not immune to the diverse developments taking place around them. Such major developments and their influence on various aspects of extension are mentioned below:

1. Globalization and Market Liberalization

Globalization is supposed to aim at creating more interaction and linkages among countries in the matters of trade, information flow, and finance, to encourage open competition through removal of trade and other national safeguard barriers, under fair and relatively equal conditions for producers of goods and

services irrespective of the country they belong to, thus mutually benefiting from international contacts and opportunities. The controversy comes from the uncertainty about fair and equal conditions for all producers, irrespective of advantages, disadvantages, potential and risk of globalization. This is because, under present conditions, developing countries cannot compete with the developed nations in the international market in terms of production, quality and exports, not to mention the heavy subsidies given to farmers in developed countries. The general impression, drawn from the now familiar demonstrations at the economic summits, is that the globalization is going to make rich countries richer and poor countries poorer. The WTO conference held in September 2003 in Cancun, Mexico, saw serious disagreement between developed and developing countries on agricultural issues, ending in the failure of the event. Apart from the politics, globalization will expose the farming communities of less developed countries to both risk and opportunities. The communities, therefore, must be educated and prepared to adjust their agricultural operations within the context of globalization, a responsibility which, by and large, the national agricultural extension systems will have to carry, and they must prepare themselves in time to meet the imminent challenge.

Market liberalization is an integral part of globalization, which calls for removal of trade barriers, tariffs and other regulatory measures that are usually put into force by countries to protect their own industries and products to discourage the inflow of the articles produced elsewhere in the world. Liberalization asks for opening of markets, or deregulation, so that goods can move freely between countries. It also advocates removal of artificial price controls and of public support to farming sector in the form of farm subsidies so that the market can realistically determine the price of various commodities and products on the basis of demand, supply and quality, so that and the consumers can freely choose what is best for them. Both commercial and subsistence farmers in developing countries are bound to be affected, directly or indirectly, sooner or later, by market liberalization, and national agricultural extension services will have to be knowledgeable enough to educate the farmers in how to enter the liberalized market properly.

Millions of subsistence farmers rarely have a chance to participate in commercial agriculture due to the fact that they produce barely enough for their own consumption, and in some very favorable cropping season, produce a bit surplus for marketing. However, currently, there is an all out force aimed at commercialization of farming even at small scale. There are questions, both ethical and technical, whether it makes sense to let the subsistence farmers continue as they have been doing for generations, or whether their operations should be transformed into agri-business, rural enterprise, rural industries, or commercialization, or whether very poor farmers of remote areas should be encouraged to migrate elsewhere. These questions seem to be valid in light of the evidence that rural poverty has persisted, if not worsened, and in many countries, rural young people, unlike their parents, are less inclined to stay in villages to continue farming. Appropriate agricultural policies and land consolidation laws will be required if privately owned and cultivated small units of land are to be combined or merged to create larger, commercially viable plots. Agricultural extension services will have to come up with strategies that could help subsistence farmers in organizing themselves for commercializing their operations profitably, without losing the pride of land ownership.

A global debate has started on the issue of producing and consuming genetically modified food. There are positions taken from different angles. On one hand, one has to use all possible means to feed the ever-increasing population, and on the other hand, one has to retain biodiversity and be alert about potential health risks to humans and livestock from genetically modified diet. In all this debate, the people who remain most ignorant are the farmers in developing countries who are growing food for millions of people. No agricultural extension services have so far felt the need to educate them in this controversial but important subject. Since biotechnology is not yet widespread in developing countries, there is no urgency to start extension programs. But this is the right time when necessary steps can be taken for preparing training courses and teaching materials both for extension workers and farmers.

PRIVATIZATION

Many services that were managed in the past by governments are now being managed and delivered by the private sector. This is especially true in economically advanced countries. In many developing countries, institutions and services are gradually being transferred to the private sector. The underlying reason is the dwindling budgets of governments and business-as-usual attitude of government employees, which makes the public institutions inefficient, less productive, causing financial losses and creating discontent among people. The Private sector, on the other hand, has more resources, innovative ideas, and a motive for profit, and in more keen to offer efficient and better services to its clientele.

There is strong lobbying from major multilateral and bilateral donors for privatizing national extension services. The main argument is that public agricultural extension systems have failed or are at best unsatisfactory. Another equally strong argument is that since farmers profit from extension advice, and the government budgets for public services are sliding, the cost of delivering this advice should be recovered by charging a fee from the clientele. One more argument in favor of privatizing extension services is that as the private sector is actively involved in selling farm inputs and machinery, they should also advise farmers on agricultural matters as they are supposed to be more efficient than the public sector. Another argument in favor of privatization is that healthy competition among service providers will lead to better quality ad less cost. There have also been calls to treat financing of extension and delivery of extension services as separate functions, to be performed by two different sectors, i.e. public and private. The trend to privatize extension services will certainly shake the traditionally friendly and informal relationship between government extension staff and the subsistence farmers in developing countries, since the latter were never asked to pay for extension advice. Apart from the question whether total, partial or no privatization of extension is needed in developing countries, the national extension services should be well versed in the pros and cons of this major issue.

Several developed countries have fully or partially privatized their agricultural extension services. The new terms like *outsourcing extension*, *cost-recovery for extension services*, and *contracting out extension* are related to the drive for privatization. Costa Rica has a unique system under which the government provides farmers with extension vouchers, which can be used for getting extension advice from private specialists. In England, the public extension service has evolved over time into a private consulting practice. The positive result is enhanced efficiency of staff, and the negative effect is the deprivation of small farmers from extension services due to their inability or unwillingness to pay. In Holland, about 60% of the extension budget comes from farmers while the government provides the remaining 40%. The benefits include increased efficiency, improved quality, client-orientation, job satisfaction for staff, and expanded marketing opportunities for farmers. The problems faced include loss of government authority, government's inability to keep its financial promises, weaker communication with the stakeholders due to creation of competition among them. In Albania, the private sector entrepreneurial initiatives to create long-term relationship with farmers have proved to be successful. The extension services in Nicaragua are both decentralized and semi-private. Bulgaria privatized a number of state farms to be used as demonstration farms, with the objective of establishing private extension service. Since the experiment was not successful, the government has decided to establish a national extension service with external financial assistance. Estonia has both, a public extension advisory service for poor farmers and a private service for better-off farmers. Uganda is experimenting with the privatization of extension through creation of a pool of private extension specialists out of its existing public extension service, which registered farmers' associations could call upon through bidding for providing services related to selected enterprises, and pay for the services from the funds given to them by the donors through central and decentralized government units. It is indeed a bold experiment, but the sustainability of this arrangement remains to be seen after the donors' funding runs out.

In Israel, the efforts to even semi-privatize national extension service have not met with success. The government is still responsible for providing extension advice, but encourages privatization through: standing practice of growers to contribute a portion of their income for research and development including extension, public and private partnership in financing and operating units within extension service, payment for services by commodity production and marketing boards beyond a basic extension package, the provision of more intensive extension activities at the request of needy growers, special agreements with commodity farmers' organizations, extension staff working on their day off for direct payment from farmers, provision of equipment like mobile phones to extension advisers by growers associations, and direct payment by farmers for participation in training activities.

The advocates of privatization of extension services believe that farmers should pay for the extension advice. However, there is genuine fear that the zeal for cost-recovery would deprive small farmers from benefiting from the services. The small farmers either do not believe that the extension advice is worth paying for, or they simply cannot afford to pay. The common wisdom would dictate that in developing countries, commercial farmers and large cooperatives should pay for extension advice while the government should provide extension services to small producers free of charge.

PLURALISM

The modality of using more than one organization, whether public or non-public, for delivering extension services to farming communities, called *pluralistic extension system*, is gaining popularity. The obvious rationale is the pooling of all available resources in order to reduce unhealthy competition, delete

redundancy of services, and compensate for low budgets of the ministries of agriculture. In certain developing countries like Mali, one finds many NGOs, private companies and semi-autonomous bodies engaged in delivering extension advice to farmers. Bangladesh's national policy on agricultural extension recognizes, for the first time, the need for partnerships with NGOs and private sector, under a decentralized extension system. In Honduras, where extension services are being privatized and small farmers are unable to pay, about 70 NGOs reach about 50,000 farmers living mostly in remote areas. In Zimbabwe, a number of public, semi-government, and private institutions are involved in delivering extension services to farmers.

The main challenge in installing a proper pluralistic agricultural extension mechanism would be the effective coordination among various agencies, the absence of which has led, in some instances, to conflicting technical recommendations creating confusion among the farmers. The governments should take the responsibility for coordination, technical supervision and support and quality control.

DECENTRALIZATION

Decentralization of government and administration has been adopted in many countries and the trend continues. The main rationale for the move is that decentralized administration shifts decision-making authority to lower administrative and political levels. These lower level units, being physically close to people, should be able to plan and implement development programs with active involvement of people. The concept is sound, but its implementation in developing countries has, so far, not been smooth for various reasons. For example, central governments have been reluctant in relinquishing their control over decision-making especially in finance; the decentralized units have been showing very weak capacity in running government affairs; and local politicians have played havoc in exercising their authority.

In many instances, decentralization has placed, agricultural extension responsibility in the hands of the ministry of local government or ministry of home affairs. Although decentralization is good in principle, the initial stage shows quite a bit of setback for extension. In the case of Philippines, for example, the interference of municipality-level politicians has compromised the effectiveness of extension programs to the extent that persons without diploma in agriculture have been recruited against agricultural extension vacancies. Also, the career development opportunities of extension staff have been adversely affected. The latest thinking is that since the municipalities are not a viable economic unit for delivering extension services, the extension responsibilities should be moved back to the provincial level. In Indonesia, the extension services have been marginalized because most district governments have certain priorities, irrespective of national policy, which could generate quick revenues, and agricultural extension, which, unlike estate crops or livestock, generally gives a long-term return, is not considered as a priority. Tanzania's decentralized extension service at field level suffers from lack of operational budget. In Kosovo, where the government comprises UNMIK (United Nations Interim Administration in Kosovo) expatriates, the decentralized government units do not want to do much with the central government. In Uganda, some district authorities have preferred to spend the extension budget on constructing feeder roads, leaving extension staff without salary for several months. One reason for this "institutional chaos", which applies to many countries, is that the central government neither prepared itself nor the local governments in advance for decentralization. Decentralization is truly a double-edged sword, and if not handled properly, could cause more harm than good.

CLIENT PARTICIPATION AND FOCUS

The civil society is advocating, more than ever before why democracy, participatory decision-making, transparency in government affairs, and good governance are necessary for eradication of poverty, uprooting of corruption, relatively equal distribution of benefits among various sections of the society, welfare of disadvantaged and vulnerable groups, optimum utilization of human and physical resources, sustainable livelihoods, and overall human development. Even the economic aid to be given by bilateral donors to poor countries, in many instances, has been tied with the government records on human rights and good governance. A large number of strategies have evolved during recent years, which supposedly ensure participatory decision-making and involvement of all stakeholders in joint planning and implementation. All grassroots level service institutions have been influenced by these conceptual thrusts.

The powerful trend towards involving farmers in decision-making has led to the modalities like *participatory farmer group extension*, *client-oriented extension*, *gender-sensitive extension*, *research-extension-farmers linkages*, and to the development of participatory tools like *PRA* (participatory rural appraisal) and *KAP* (knowledge, attitude and practice) survey. The advocacy for *empowering farmers* has increased tremendously.

Indonesia has successfully established new institutions called Agricultural Technology Assessment Institutes at provincial level, bringing together farmers, researchers, and extension specialists. In Pakistan, groups of highly motivated small farmers established under FAO's Special Program on Food Security, have been taking decisions in matters related to group cash savings, quality seed, fertilizer, water-management, cultural practices, farm machinery, income diversification activities, and marketing of produce. The pilot experiment has proved to be so successful in terms of yield increases that the government has embarked upon replicating the approach in 109 villages. In Argentina, one main factor for success of a federal program for small- and medium-size farms is the involvement of all stakeholders in major decision-making. Similarly, Jordan's extension service has established Close Contact Groups of farmers while Tanzania has formed Participatory Farmer Groups of men and women farmers. In Philippines, under an FAO project, a methodology for participatory, grassroots extension program development has been outlined, and an extension delivery partnership mechanism has been developed, involving stakeholders such as extension staff, farmers, NGOs, private sector, research institutes, and academic institutions.

NATURAL DISASTERS AND WARS

Human miseries are on the rise in this age of civilization and scientific progress, some are man-made and some are natural disasters. There are conflicts, wars, droughts, famines, storms, earthquakes, and epidemics, which take enormous human and physical toll and disrupt the normal course of life. There has been a steep increase in the number of countries afflicted by human-induced disaster, i.e. from an average of 5 in 1980s to 22 in 2000, mainly due to conflicts. Between 30 and 40 countries were engaged in conflict at the end of the 20th century, adversely affecting thousands of millions of people. In the recent years, weather-related disasters have risen from 10 to 18 per year. In 1998 alone, some 32,000 persons were killed and 300 million were displaced from their homes and livelihoods. Farmers of some countries like Afghanistan cannot farm due to land mines in their fields. Basic farming ingredients like seed, water and soil are not readily available. Extension services have dissipated and the farmers have no source of technical advice. Infrastructure has been damaged, making the transportation and delivery of farm inputs impossible. Although food aid agencies and NGOs have been active in disaster hit areas yet food handouts work only to a limit. Agricultural extension services have not yet played any significant role in post-disaster situations. It is understood that the extension services cannot face such colossal challenge by themselves, but they should work in collaboration with relevant institutions and help the rural population in growing food for survival using whatever resources available. A comprehensive response from national agricultural extension systems is still awaited.

INFORMATION TECHNOLOGY REVOLUTION

We are in the middle of information technology revolution, which has virtually shrunk the world and has affected almost every walk of life. Information technology is a tremendous power that could be harnessed by organizations for the benefit of mankind, and extension services cannot keep themselves aloof from its application. They can exploit this potential to strengthen their own capacities and to educate the rural populations who have access to media. The extension organizations in developing countries have two major problems when it comes to having face-to-face contacts with the farmers and researchers: first, physical distances and the second, lack of transportation facilities. The new information technology can bypass these physical barriers to a great extent through the development and application of appropriate, interactive information mechanisms.

Information technology is already making headway in the area of rural and agricultural development. A number of developing countries such as Laos, Vietnam and Mali, are experimenting with *telecentres*, which have already exhibited their benefits in several West European countries. *Virtual linkages* are being established for bringing research and extension together, and one example is VERCON (Virtual extension, research and communication network) tool, which FAO has introduced in Egypt, and countries like Bhutan have requested assistance in installing this innovative tool. Under an FAO project in the Philippines, the internet and interactive e-mail facilities have been established at municipality level for supporting decentralized extension staff. Then, *expert systems* are being developed to compensate, to some extent, for rare visits of subject-matter specialists to farmers' field. The use of cellular phones is by now a routine practice and the equipment is being used for rural development projects in Bangladesh. Over 30% of extension staff in Estonia use the internet. One can find programs like "virtual gardens" and "virtual farms" on the World-Wide-Web. The main issue is how can the powers of advanced information technology be harnessed for the benefit of both extension agents and farmers without compromising the importance of unique local factors such as indigenous communication patterns, and without replacing the extension agents.

RURAL POVERTY, FOOD INSECURITY AND HIV/AIDS EPIDEMIC

There have been internationally renewed calls for eradication of rural poverty and hunger, and for support to vulnerable groups such as rural landless, women and youth. The number of poor has gone up in recent years. Moreover, even though there is enough food produced for everyone in the world, yet 800 million people, almost one in seven persons, do not have enough to eat. Hunger, poverty and vulnerability are inter-linked. While the world celebrated the new millennium, 13 million people were brought to the brink of starvation in the Horn of Africa, and the European farmers and livestock industry were hit by mad-cow and foot-and-mouth diseases. New anti-hunger programs initiatives are underway, especially since the 1996 World Food Summit held in Rome, which will definitely involve all those institutions, which deal with rural population. There is no way that agricultural extension services that are in frequent contact with the rural people will remain isolated from these international efforts against rural poverty, food insecurity and epidemics. They need to develop suitable strategies to effectively participate in the war against these human miseries.

Some 40 million people are affected by HIV/AIDS worldwide of whom 95 per cent live in developing countries, 28.7 million in sub-Saharan Africa and 7.1 million in Asia. According to an estimate, about 32 million people are currently infected with HIV, and the number is spreading fast. In 2001, AIDS killed over two million people, while three million persons died in 2003. Millions more could die in the coming years unless drastic measures are taken to effectively end this invasion of death. India is already under close watch while there has been rather sudden eruption of HIV infections in China, Indonesia and Vietnam. There are indisputable, negative effects on manpower, resulting in the loss of trained, skilled and experienced workers in all disciplines. Farm labor, plentiful in the past, is diminishing fast. The epidemic has also affected agricultural extension organizations in the sense that not only have there been deaths and long absenteeism among the staff but also the old, traditional extension approaches have been rendered unsuitable. This is due to the fact that the current cropping patterns have been changed due to weakening physical condition of farming population, emergence of "new farmers" comprising elderly, widows and young children, unsuitability of current farm tools, and unsuitability of existing rural credit approval criteria. Extension organizations in the countries affected by HIV/AIDS, especially in the sub-Saharan Africa, have to come up with fresh extension strategies, supported by modified farming systems and appropriate farm tools.

INTEGRATED, MULTI-DISCIPLINARY, HOLISTIC AND SUSTAINABLE DEVELOPMENT

The global preference for multidisciplinary, integrated, and holistic approach to development is now an undisputed fact. The rationale is that simultaneous, multi-sector development is more meaningful than individual sector development at a time. More and more organizations are revising their structure in favor of this choice. The reorganization at the Asian Development Bank is a recent example, where several technical departments have been placed in each newly created country department unlike before when the focus of the organization was on having a number of individual technical departments to cover all the member countries. The "integrated rural development approach", which was applied during 1960s in many countries, is returning in a reformed mode, including elements of bottom-up emphasis, participation of stakeholders, emphasis on eradication of rural poverty and gender-sensitivity. Many multilateral donors have adopted program approach, abandoning the old project approach. FAO has been running an integrated program in Namibia, Uganda, Zambia and Zimbabwe, which has as many as six technical components including research and extension. The *sustainable livelihoods* concept also promotes holistic development. The Neuchatel Initiative Group comprising major donors interested in reforming national agricultural extension systems, is currently exploring the role of extension in a wider rural and agricultural development context. FAO and the World Bank are jointly working on AKIS/RD (Agricultural Knowledge and Information Systems for Rural Development), which is aimed at increasing cooperation and joint operations between research, extension, education and farmers. FAO has conducted studies on AKIS/RD in ten countries, in various regions of the world.

The extension services are being unified in a multi-disciplinary manner in the interest of optimum decentralization of resources and an efficient bureaucracy. Indeed, the farmer's time cannot and should not be wasted through individual visits of many extension agents, each representing a different agricultural discipline. The creation or strengthening of multi-disciplinary subject-matter specialists teams during decentralization of extension services in a number of countries is a popular move. FAO has provided technical assistance to Uganda in the integration of agro-forestry and HIV/AIDS education in the agricultural extension programs, thus making the extension approach multi-disciplinary. In Iran, the FAO has recommended the placement of a multi-disciplinary team of subject-matter specialists at the district

level, the composition of the team to be determined by the technical needs and priorities of each district. Thus, the districts in coastal zones will have a fisheries specialist, and those with dominant livestock activities, will have a livestock specialist. In Indonesia, both agriculture and forestry extension have been placed under a single extension service assisted by a World Bank-funded project. The same has been done in Laos. In the Philippines, extension service covers both agriculture and fisheries under the Agriculture and Fisheries Modernization Act. Under a project funded by the Asian Development Bank, Vietnam's extension services are being reformed, and one of the reform measures will be unification of present extension services.

FIFTEEN DIRECTIONS FOR REFORMING EXTENSION IN ASIA

1. Formulate National Policy on Extension to Ensure Political and Financial Commitment

So far, only a few Asian countries, like Bangladesh, Nepal and Philippines, have formulated a national extension policy. The existence of policy ensures political commitment, which ascertains financial allocation. The dismally low salaries and operational budgets, and a lack of career development path have been the fate of extension profession for decades, and it is high time to change this pattern through formulation of extension policies within the framework of broader national agricultural and rural development policies. The formulation of extension policy should be a collaborative effort, involving all stakeholders, and should take into consideration not only technical issues but also professional development concerns with an aim to provide motivation and morale to extension workers. It should also include the operational linkages and partnerships between extension and other relevant service institutions such as related to research, marketing, environment, commodities, farm inputs, rural credit, agricultural education and training, farmer associations, and information technology.

2. Give Extension Profession a Respectable Status

Agricultural extension has played a vital role in bringing about agricultural and rural development in countries like the United States, Australia, Japan, and those in the Western Europe. Unfortunately, even though most extension organizations in Asia were established over half century ago, the profession of extension has never received the proper status it deserves, in comparison to other agricultural professions. Agricultural extension is a tough and demanding profession, both physically and intellectually, yet even today, extension workers get very low salaries, meager benefits, and negligible opportunities for development of their professional career. No surprise that few young men and women venture to select extension as a career after graduating from high school. Suitable candidates will never be attracted to this profession until its service conditions are brought in line with other agricultural disciplines, and the present extension organizations are given adequate operational budget, career development opportunities and mobility means, something essential for proper field work. Without this long overdue reform, agricultural extension in Asia will remain a second class profession, in spite of its demonstrated importance in bringing about rural and agricultural development in highly developed countries.

3. Reform Pre-Service Education in Extension in Line with Ongoing Reforms in Extension

Presently, the pre-service education in agricultural extension is no more than lip service. The curricula are outdated, audio-visual aids are missing, suitable educational methodologies are unknown, and above all, the students of extension are given heavy doses of theory, without any exposure to real-life extension work involving rural life, farms and farmers. It is hardly surprising then if the new graduates have no technical competence and professional confidence while facing farmers, some of them for the very first time in their life. It is true that not many extension agents have an aptitude for living in rural conditions a result of both faulty selections of students for agricultural extension major as well as total disregard for practical training. Appropriate pre-service education will reduce the need and costs of future in-service training. Any serious effort at reforming the national agricultural extension systems should logically start with the reform in extension education at agricultural academic institutions, which currently produce graduates with inadequate preparation for extension service.

4. Decentralize Extension without Politicization but with Early Capacity-Building of the Decentralized Units

While decentralization is a step in the right direction, it has proved, at least so far, to be disastrous for agricultural extension in several Asian countries. The issue of the temptation of each autonomous district or municipality to go in its own direction without any regard for national policy and priorities is serious, but what has damaged extension most is the unwarranted influence and interference of local

politicians and the mentality of local decision-makers and legislators, who cannot appreciate the importance of extension in rural and agricultural development. This has resulted in the diversion of extension budget to other activities, assigning of extension staff to non-extension tasks, use of its few beaten-down equipment and vehicles for personal purposes, and hiring of non-agriculture graduates for agricultural extension positions. Since the local decision-makers mostly depend on central government for their financial needs, their preference is ruled by a strong temptation to earn revenue in the shortest possible time in order to reduce this dependency. Agricultural extension is understandably a slow process as it aims at changing human behavior and generally does not show quick and tangible benefits. The local decision-makers, who are elected for two to three years term, prefer to select activities like livestock and estate crops, which give sizable, tangible and relatively quick returns, or to build roads and shopping centers, which could win voters' appreciation and guarantee votes for the next election. This mentality of local decision-makers, most of whom have limited education, needs to be changed through their orientation to national policy and priorities, proper education, sensitization and orientation to the importance and eventual benefits of extension. Unless this important group is "converted", agricultural extension will remain marginalized, or might altogether disappear, under decentralized administration. Asian countries like Pakistan and Nepal can make the process of decentralization smooth by taking capacity-building measures for decentralized units, and can also draw other lessons from the experiences of countries like Chile, Colombia, Uganda, Philippines, Indonesia, Tanzania and Ghana where decentralization came into effect many years ago.

Decentralized units need capacity building at early stages of decentralization. Extension staff should be trained in the philosophy of decentralization, participatory, grassroots program planning, organization of men and women farmers' groups, and integration of village extension plans into district development plans. The decentralized staff will need new terms of reference, which should also clarify their relationship to the local government t officials.

5. Promote Pluralism in Extension by Involving Public and Private Institutions

Certain Asian countries already have some sort of pluralistic extension pattern as, in addition to public extension service, commercial agricultural companies and NGOs are involved in delivering extension advice. However, there is no well-organized system, which will allow active collaboration of stakeholders in both planning and implementation of extension programs. Such a system is needed more than ever as more and more countries are introducing pluralism. A clearly defined role of government comprising functions of national policy guidance, coordination, quality control, technical support to weak private organizations and NGOs, and settlement of disputes, will be needed for any pluralistic extension pattern to safeguard the interests of farmers.

6. Empower Farmers' Groups to Create a Lobby for Extension

The first step towards empowering farmers is to organize them in groups and associations. Ensuring their legal status through formal registration should follow this. The next action should be to provide them with the training needed to prepare plans and make decisions. Extension staff should be able to organize special-interest groups of men and women farmers in order to empower them so that they could exercise their group influence in requesting credit, farm inputs, and in farming and marketing matters. If these groups are satisfied with the performance of extension services, they could serve as a strong lobby for extension especially under decentralized government. The participation of farmers in extension program development is generally not practiced since most of the countries in the Region have been following top-down models of agricultural extension for years. Necessary training modules and materials should be developed for extension staff and stakeholders. Similarly, situation-specific participatory extension methodologies will need to be developed keeping in view the sensitivity of religious, cultural and social norms.

7. Privatize Extension where it is Socially and Economically Feasible

The challenge is not to privatize entire extension services for all farmers, but to privatize extension where it makes sense. Under the present conditions, hundreds of millions of Asian subsistence farmers are neither able nor willing to pay for extension advice, the quality of which in most cases does not make a convincing case for cash payment. The much-needed accountability of extension agents to farmers should not be used as an excuse for the privatization of the entire extension system. If the extension advice is worth paying for because it enhances farmers' income, then commercial farmers, cooperatives and producer associations will be inclined to pay. In case partial privatization of extension is opted, for proper rules, regulations and procedures will be needed both for private extension advisers and their client farmers

to protect the interests and rights of all parties. In addition, the government will have to take measures for quality control of extension advice to protect farmers from being exploited. It will be prudent for Asian countries to try various methods, which have been tried elsewhere in the world to lessen the burden on public budget and encourage non-public parties interested in delivering extension services. Two methods could be *contracting out*, i.e. when the government gives contract to other parties for provision of specific extension services in a specific area for a specific period, or *contracting in*, i.e. when the public extension service signs a contract for providing specific extension services for a certain amount of fee to specific clientele for a specific period.

Some of the pre-requisites for proper privatization of extension services include: the existence of competent private extension companies and individual extension advisors, strong farmers' associations with legal status which could not only effectively demand extension services but could also evaluate their soundness and be willing and able to pay for the advice, and government mechanism for supervision and quality control of extension services to be provided by the private sector.

8. Prepare Extension Services to play a Constructive Role in Post-War, Post-Disaster and Epidemic Situations

The role of extension in combating major attacks of insect pests and diseases is well known, but so far there has been none for major disasters. Human-induced and natural disasters have not spared Asia, like many other parts of the world. Long wars and earthquakes have devastated Afghanistan. Bangladesh, India, China and Philippines have been experiencing damaging floods, resulting from continued torrential rains. Small islands in the Pacific have their own calamities from time to time. Extension is normally considered as a peacetime activity. However, given the fact that a large number of farming people are affected by these disasters and epidemics, and the surviving ones are anxious to return to their villages and start growing food, the extension services can launch special campaigns for rehabilitation of agriculture. This obviously should be done in close collaboration with other agencies, which are responsible for provision of credit, seed, fertilizer, pesticides, herbicides, and farm equipment. Bringing the affected farming population back to their feet is a challenge, which has not yet been met by any extension service in the world. The Asia Region may take lead in this task.

9. Broaden the Technical Mandate of Extension to Aim at Broader Development of Rural Human Resources

As there are calls for broadening the technical scope of extension, keeping the entire focus on just agricultural technology transfer is a case of short sightedness. There is a pressing need that extension starts educating farmers in the interrelationship between agricultural production, food security, population, environment and any epidemic such as HIV/AIDS. This indirect approach is far more promising than giving blunt messages to farmers on family planning, environment protection and increasing production. The changes in the world also demand that the Asian extension services engage in developing the human capacities of farmers, which go beyond technology. They should educate men and women farmers in the subjects of problem-solving, decision-making, management, accounting, group dynamics, leadership, participation, gender sensitiveness, rural youth development, good governance, citizenship, initiative and self help, nutrition, program planning, monitoring and evaluation, information technology, importance of education for children especially for girls, networking with other village organizations and farmer associations, etc. Rural poverty and food insecurity are concerns that extension should include in its mandate. Out of the total two billion rural Asians, 670 million people still live in poverty. Obviously, a broader mandate of extension involving human and knowledge aspects of rural development will require appropriate in-service training of the extension staff and necessary adjustments in the curricula of formal education in agricultural extension. Changing the title of the discipline from agricultural extension to agricultural and rural extension may also be considered.

10. Develop and Apply Information Technology Tools to Facilitate but not to Replace Extension

The revolution in information technology must benefit extension. Interactive electronic linkages may be established between extension and relevant institutions. Extension data bases may be created, containing information on last few years' prices of various commodities and projections for the near future, records of climate for the last few years and any expected unusual weather pattern in the near future, proven main agricultural technologies, contact mailing and e-mail addresses, and telephone numbers of subject-matter specialists and agricultural produce buyers, demand for grains and vegetables, etc. A variety of extension and training materials may be prepared with the help of computer, using creative techniques. *Telecentres* may be established in the areas, which are not normally covered by extension agents for reasons like less staff and remote location, ensuring that periodic human follow-up is available. Extension

offices should be linked with one another and with other institutions such as research through virtual, interactive links. The efforts to apply information technology should be started at locations, which have necessary infrastructure and pre-requisites. The other areas, obviously, will have to wait. A note of caution: information technology should not be considered as a replacement of human effort in extension, but just as a tool to facilitate the work of extension agents.

11. Develop Original, Location-Specific, Participatory, Gender-Sensitive and Inexpensive Extension Methodologies and Materials Instead of Imitating Imported Models

By and large, the Asian countries have been using top-down extension methodologies for decades, Training and Visit (T & V) system of extension is the main one. Another major, popular methodology has been Farmer Field School (FFS), which was initially used for integrated pest management (IPM) projects in Philippines and Indonesia. Basically, both of these extension methodologies were not developed locally but "imported", and in spite of some good features, suffer from a common weakness of being too costly, hence their questionable sustainability. Unfortunately, there has been little zeal for developing situation-specific methodologies, as the Asian Region does not seem to have gone beyond those two extension methods. One fact established through observations and experience, is that no single extension methodology, no matter how successful in certain situation, is suitable for all situations. The situation comprises people and their characteristics, farming patterns, geographical location, population density, institutions, infrastructure, local customs, and possibly some other factors, which are to be kept in mind while developing an appropriate extension methodology. Therefore, a country like Nepal, which has plains, high mountains, irrigated areas, and rain fed areas, could rightly end up with several extension methodologies to cover each unique set of circumstances. Similarly, the extension strategies will be different for people who farm in the islands, or under desert conditions. The recent extension reform movement has identified some useful principles such as participation, which cut across all situations and may be used to develop specific extension methodologies. What is needed is a normative framework, based on those common principles, which may be used by Asian countries for developing extension methods suiting their individual situations. It is not only extension methodologies, but also extension and training materials, which are in serious dearth. The materials in easy-to-understand illustrations and language on various technical subjects, prepared following adult education principles, are needed which could be used by men and women farmers to learn and comprehend technical key points, followed by practical training.

12. Orient Extension Staff to Major Global Developments that could Eventually Affect Rural Livelihoods

Presently, no one is educating the farmers in the issues related to globalization, liberalization of markets, genetic engineering and biotechnology, which are sooner or later going to affect their communities. For example, China has been admitted to WTO, and this major development is bound to result in significant reconsideration of present national policies and procedures of agricultural production, agro-processing, storage, marketing, and quality control. That is why China's national extension system must be equipped with necessary knowledge and skills to start educating farmers in possible effects and expectations resulting from the country's entry into WTO. The issue of farm subsidies will also surface within the context of liberalization of markets. Special training courses are needed for extension agents to enable them to properly educate the farmers. Similarly, it may seem a bit premature at this moment, but the time is not too far when farmers will be asking extension agents questions about biotechnology and genetic engineering. Extension services should start developing simple training materials and capacity-building programs in these areas.

13. Make Extension Services Demand-Driven for Farmers' Benefit and Extension Workers' Professional Satisfaction

No one can challenge the fact that the public extension services in Asian countries have been supply-driven, and this is a major criticism on the public services. This is time to reverse the approach. Extension is essentially a service to address farmers' needs. As such, it should not impose its messages on farmers without ascertaining that the farmers really need that particular advice. Making extension service demand-driven asks for many relevant activities such as grassroots extension program planning based on farmers' needs, which will demand full involvement of clientele in decision-making process, evaluation of the services provided by extension staff, which will require at least some impact assessment, an accountability mechanism under which the farmers can express their satisfaction or unhappiness with the services delivered by extension workers, and change in the mentality of the extension workers that they are serving the farmers and not doing a favor by giving technical advice. Based on the rating of the performance of extension workers by the clientele, the extension administration should decide on rewards or disciplinary actions for the relevant staff.

14. Separate The Functions of Extension Financing and Service Delivery in the Interest of Efficiency and Cost-Effectiveness

It should not be necessary for the government to deliver extension services only because it provides funding for extension staff and operations. The functions of funding and delivery of services should be separated. The government can provide funds but give contract to NGOs or private sector for delivery of services, making sure that the quality of services is satisfactory and the farmers are not exploited. Such an approach will reduce the need for a large public extension staff. In certain situations such as in remote areas, which are usually ignored by government extension workers, the modality of contracting out makes even more sense. In some cases, the source of funds may not be the government but a national or expatriate donor agency, and the services may be provided by the government extension workers or by some non-public extension company or NGO.

15. Prepare Extension Services to Promote Sustainable Development to Safeguard Resources for Future Generations

The mandate of almost all the national agricultural extension services in Asia and the Pacific remains the transfer of agricultural technology. As long as the new technology can raise yields, the extension agents will fervently promote it, without any thoughts to its environmental friendliness. During 1960s, the Green Revolution was the result of breeding and cultivating high yielding varieties, proper irrigation, and application of high doses of fertilizers and pesticides. That recipe for gaining high yields is currently under criticism due to its unfriendliness towards conservation of environment and natural resources. This is the reason that technologies like IPM have received more favorable attention. The rural population in Asia, which constitutes one third of the world's total population, depends almost entirely on three main activities: agriculture, forestry and fisheries, and that means constant exploitation of these major natural resources. The rapid growth in rural population also takes its toll. Between 1970 and 1995, in spite of the fact that human fertility declined in most parts of the world, Asia's population increased by 60%, i.e. an addition of over one billion people. Agricultural extension services in Asia are faced with the challenge to educate the farmers in environment sustainability, natural resources management, and organic farming, something they are not used to. FAO has successfully demonstrated that environment education; population education and agricultural production can be incorporated into ongoing extension programs, with positive results.

CONCLUSION

Extension is going through major transformation. Both governments and donors want public extension systems to be lean, cost-effective and to play the role of a facilitator. The financing of extension and delivery of extension advice are being treated as separate functions, and actors such as private companies, NGOs, private advisors, civil society institutions, and producers' organizations are being welcomed to the arena of extension. Flow and exchange of information among stakeholders has been facilitated by giant leaps in information technology. Demand-driven extension is drawing favor over supply-driven services. Men and women clientele are being encouraged to have a bigger say in decision-making and hold extension workers accountable if they do not deliver. Extension knowledge is being termed not only as public good but also as private good. The needed new role of government in pluralistic extension system, privatized extension and in encouraging sustainable development is being recognized. Expectations from extension are rising as the issues like food insecurity, rural poverty and post-disaster situations go higher on the agenda of world development and as the influences of globalization, decentralization and market liberalization gradually and eventually descend on the rural households. Asia is the region that made headlines in the world during 1960s owing to its globally appreciated Green Revolution, and again when it pulled itself out of recent economic crisis sooner than expected. The practice of extension in this region of great agricultural and food production success traditions, should not continue to be old fashioned because it is not business as usual any more. The transformation of extension demands political and fiscal commitment from politicians and policy-makers, so that this noble profession could serve the emerging educational needs of rural and farming populations a lot better than in the past. However, it is of great importance that lessons be learned from recent and ongoing extension reforms and applied to the designing of future reform measures in order to avoid repeating the known negative experiences.

REFERENCES

Asian Development Bank (2000): *Rural Asia: Beyond the Green Revolution; 2000*

FAO Anti-hunger programme(2002): *Reducing hunger through agricultural and rural development and wider access to food (First draft of the resource paper discussed in the World Food Summit: five years later*). Rome: May 2002.

FAO (2002): *Mobilizing the political will and resources to banish world hunger. Technical background documents for the World Food Summit: five years later*. Rome: 2002.

FAO/World Bank (2000): *Agricultural knowledge and information systems for rural development (AKIS/RD): Strategic vision and guiding principles*. Rome: 2000.

Farrington, Ian Christoplos, Andrew D. Kidd and Malin Beckman (2002): *Extension, poverty and vulnerability: The scope for policy reforms (Final report of a study for the Neuchatel Initiative); Working paper No. 155. London, UK: Overseas Development Institute*; March 2002.

Kaosa-ard, Mingsarn Santikarn and Benjavan Rerkasem (2000): *The Growth and Sustainability of Agriculture in Asia; Asian Development Bank*; 2000.

Neuchatel Group (1999): *Common framework on agricultural extension*. Paris: 1999.

Qamar, M.K (2000): "*Agricultural extension at the turn of the millennium: trends and challenges", Human Resources in Agricultural and Rural development*. Rome: FAO, 2000; Pp. 158-170.

Qamar, M.K (2001): "The HIV/AIDS epidemic: *An unusual challenge to agricultural extension services in sub-Saharan Africa". The Journal of Agricultural Education and Extension*. 2001; Vol. 8, No. 1; Pp. 1-11.

Qamar, M.K (2002): "*Global trends in agricultural extension: Challenges facing Asia and the Pacific Region"; Keynote paper presented at the FAO Regional Expert Consultation on Agricultural Extension, Research-Extension-Farmer Interface and Technology Transfer, held in Bangkok*; 16-19 July, 2002.

Rivera, William and M. Kalim Qamar. *Agricultural Extension, Rural Development and Food Security Challenge*. Rome: FAO, 2003.

Rivera, William M., M. Kalim Qamar and L. Van Crowder (2002): *Agricultural and rural extension worldwide: Options for institutional reform in the developing countries*. Rome: FAO, 2002.

Smith, Lawrence D (2001): *Reform and decentralization of agricultural services: A policy framework*. Rome: FAO, 2001.

UNAIDS and World Health Organization (2003): *AIDS Epidemic* Update 2003. Geneva: 2003.

Wentling, Tim L., Ronny Adhikarya and Chye-Hean-Teoh (2001): *Participatory environment education and training for sustainable agriculture: Best practices in institutional partnership, peer learning and networking*. Rome: FAO, 2001.

2. STRENGTHENING EDUCATION-RESEARCH-EXTENSION LINKAGES FOR EFFECTIVE AGRICULTURAL EXTENSION SERVICES: EXPERIENCE OF PAKISTAN*

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INTRODUCTION

Pakistan is a federation of four provinces and federally administered tribal areas. It is basically an agricultural country with a total population of over 145 million, out of which about 68 per cent directly or indirectly depends upon agriculture. Agriculture contributes about 25 per cent to the GDP and absorbs 44 per cent of the total labor force. Pakistan follows mutually supportive Rural Development and Agriculture Policies which are highly ambitious and theoretical in nature and lay major emphasis on enhancing per unit productivity ensuring food security, commercial agriculture export orientation, human development, environment sustainability, better quality of life and rural poverty alleviation.

Where as agriculture, rural development and education are concerned, Constitutionally, the Federal Government is responsible for the policy planning, resource mobilization, and inter-provincial coordination. The provincial governments are responsible for implementation of all programs covering these subjects.

Ministries of Food, agriculture, and livestock, rural development, local government and environment, education, science and technology, women, population welfare and social development, and information and broadcasting at the Federal level and their corresponding line departments at the provincial levels are the major agriculture/rural development operators. In addition, agricultural universities/colleges, some NGOs and private/corporate sector organizations directly or indirectly perform roles similar to major agriculture/rural development operators by planning and undertaking activities in agricultural education, research and extension. .

Pakistan Agricultural Research Council (PARC) is an apex national scientific body, which undertakes, aids, promotes, and coordinates agricultural research. It organizes high-level training, acquires, disseminates and promotes adoption of newly evolved agricultural technologies through its network of research and technology transfer institutes located throughout the country.

The PARC's institutional set up performs the mandated roles in collaboration with provincial institutions/organizations to avoid duplication. For example, PARC carries out the basic and strategic research whereas the provincial research institutes deal with applied and adaptive research. However, the universities are autonomous bodies and perform their educational and research roles independently with very little joint programming and linkages with PARC and other private sector agriculture/rural development operators. Apparently all agriculture/rural development operators are aware of their expected roles in the system but there seem to be some gaps in the perception and actual performance of their roles at all levels.

The National Agricultural Research System of Pakistan, (a top-down hierarchy) conceived an inter-ministerial, inter-institutional and inter-provincial coordination mechanism with the participation of representatives of all agriculture/rural development operators. The composition of this mechanism reveals that the small farmers are hardly involved in the coordination mechanism. Moreover, the existing coordination mechanisms face a number of operational problems, which make them ineffective as planning and implementation coordinating bodies.

The national agriculture policies and programs conceived and launched in Pakistan from time to time the aim of establishing and strengthening the linkages between education-research-extension and extension services-input supplying agencies to achieve the goal of food security, poverty alleviation and better quality of life for all in the rural areas. A lot of progress has been made to achieve this goal but the degree of success is far below the potential due to number of complex reasons, one of which happens to be inadequate integrated input of agriculture research, extension, and education into agricultural / rural

* Paper is adapted from a FAO National Case Study entitled Agriculture Knowledge and Information System in Pakistan. The study was prepared and submitted by the author in November 2002

development programs. An attempt is being made in this paper to review the efforts already made by different operators of agricultural education and extension systems and to identify future strategies/actions to further strengthen linkages between education-research-extension which may contribute to the development of effective agricultural extension services in Pakistan.

AGRICULTURAL EDUCATION SYSTEM

It is a unique inter-ministerial program, which is planned and implemented in the light of recommendations of the National Policies of Agriculture and Education under the administrative control of Federal Ministries of Food, Agriculture and Livestock, and Education, and Provincial Departments of Agriculture, and Education. At present the higher agriculture education is delivered through five agricultural universities (one each at Faisalabad, Lahore, Peshawar, Rawalpindi and Tandojam) and six colleges. These institutions of higher learning were established with the aim of producing trained personnel in agricultural research, extension and education so as to meet the need of human resources for agriculture and rural development in the country. Each of the five universities were established on the pattern of American State universities and charged with the roles of teaching, research and extension. According to one estimate, about 11,000 students are enrolled in these institutions pursuing different level of degree programs. All of these universities and colleges offer a degree in agriculture. The five universities also offer second degree in agriculture where as only three out of the five universities offer a doctorate degree in selective disciplines.

The intermediate level education is offered by eight agriculture training institutes which conduct two years diploma courses for field/stock assistants under the supervision of provincial agricultural departments whereas a large number of mono/polytechnic institutes and colleges of technology under the provincial education departments offer two to three year diploma courses and one year certificate courses in agro-tech. In addition, the separate stream of Matric (Tech), F.Sc (Tech) and B.Sc (Tec) programs have been introduced recently in rural schools/colleges of Pakistan. No formal agriculture education is imparted in the primary schools. However, several research, education and extension institutions to help promote adoption of these technologies by the farming communities, are offering short courses covering various agricultural technologies.

The strategies and mechanisms used and problems faced in planning and implementation of higher and intermediate agriculture education programs are explained briefly in the following subtitles:

1. Higher Agricultural Education

1) Administration and Management

The Peshawar, Rawalpindi and Tandojam agricultural universities are linked to the Federal Ministry of Education through the University Grants Commission for funding and coordination purposes. However, Faisalabad University, and Lahore University and some agriculture colleges are administered by the Provincial Agriculture Department but their linkages with agricultural research and extension programs of the provincial agriculture department remain negligible. As a result, the agricultural education programs of the universities and colleges started developing in isolation without proper input from the research and extension systems, which are the end users of the university graduates. Some of the agricultural colleges are constituents of general universities.

The universities are autonomous and have their own decision making bodies, -Syndicates, Academic Councils and administration from Chancellor down to Vice-Chancellors, Deans, Heads of Departments, Treasurer, Controller of Examination, Librarian etc. etc. The syndicate comprises of representatives from the intellectual community such as agricultural researchers, and educationists, judiciary, politicians, farming community and teachers, whereas the academic council consists of representatives of different departments/faculties, professors and other intellectuals. These bodies are assisted by different technical and advisory committees in decision making related to planning of university programs and their implementation. The higher agriculture education is thus being planned, administered and managed by multiple forces through a consultative process with a semi-decentralized mechanism.

2) Roles and Responsibilities

The review of available literature about the expected roles of these institutes of higher agriculture education and the discussions with some of the representatives of concerned stakeholders reveals that the universities and colleges have been performing their teaching (education) role regularly but the others two roles namely research and extension have suffered a sever setback. The reason is lack of funds, inappropriate linkage with the research stations /centers under the provincial department of agriculture and private sector, top-sided manpower development, inadequate library resources, and data collecting facilities,

and negligible (if any) university extension projects providing first hand opportunity to the university specialists to work with the farmers and other members of the rural community.

3) Curriculum Development Modalities and its Relevance

The academic programs covering curricula and teaching-learning material is developed with the help of different technical committees through a well-conceived consultative process. However, the curricula remained theory oriented. Too much emphasis on theoretical information has resulted in deficient practical skills, initiative, original critical thinking and quality of leadership and communication. To help over come these problems, the University of Agriculture, Faisalabad has launched an attachment program under which all students of final year B.Sc (Agri Extension) spend the last semester of their program of studies working with the farmers, researchers and trainers under the joint supervision of the staff of the university and a host of public, private and non-governmental organizations. It is hard to comment on the effectiveness of this attachment program as it has just started and no evaluation has so far been undertaken. However, conceptually, this strategy seems to be a step in the right direction for providing practical orientation training to the students.

The higher agriculture education curricula are developed centrally by the university and followed in all agricultural colleges affiliated with it in the province, knowing well that there are major ecological zones in each province requiring special expertise on the part of the graduates to work with the farmers in those ecological zones. Therefore, the present curricula more or less continue to be irrelevant to the needs and requirements of farmers in different ecological zones.

The curricula for the training of intermediate level technicians place emphasis primarily on crop production and plant protection with only a marginal reference to subjects related to other sub-sectors of agriculture such as livestock, poultry, fisheries, forestry, and social sciences particularly transfer of technology techniques, participatory modalities for program planning, implementation and evaluation. Therefore, the trainees under these institutions are likely to pass out without fully developing appropriate skills and understanding of integrated farming system and their capacity to work with farmers for resolving problems related to rural life under farmers' circumstances remains limited.

Such deficiencies could be made up by adapting the centrally prepared curricula to the needs of the ecological zone and requirements for producing better qualified and well equipped graduates to serve the farmers in those localities. However, periodic review of the curricula and linkages with the research and extension centers in the locality will help to keep the curricula up-to date and make agriculture education relevant to the needs and interest of the rural communities.

4) Human Resources

There is a general scarcity of highly trained and specialized personnel because of ineffective personnel policies of the Ministries in general and agricultural universities and colleges in particular. Many positions remain vacant for want of suitably qualified staff. There is hardly any effective mechanism to ensure supply of highly trained staff on a regular basis and to provide incentives for the up-gradation of professional competence and enhancing and updating of expertise. However, one can come across some universities that are offering PhD degree programs to their employees for upgrading their level of expertise. Similarly, periodic fellowships of a limited number are offered for short and long in-service training of university teachers leading to certificate and degree programs within, as well as outside the country. Government policy encourages such training within the country. But all such provisions fall far below the requirement of trained human resources. It is hard to find any systematic in-service training plan for the staff of agricultural universities and colleges and institutions in the country.

The position of availability of highly trained faculty at the intermediate level training institutes (Field Assistant Training Institutes) and the provision for their in-service training is not different from the personnel position at the higher agricultural education institution. In some case, it was observed that the staff situation in the Field Assistant Training Institutes is even worse as some staff members from the field are sent to the training institute irrespective of their qualification, interest and experience in teaching causing serious damage to the program of studies.

There are ambiguous procedures for recruitment, salary fixation and revision (pay scales), and promotion and absence of an appropriate monitoring and proper evaluation of teachers. All of this is adversely affecting the morale of the teachers on one hand and the quality of instruction on the other hand.

In order to help over come the problem of shortage of highly trained human resources, there is a need to prepare an eight year national master plan for manpower development keeping in view deficiencies in the identified disciplines and specialties and the total need of trained human resources, number available in the country as per discipline, and the number required. The plan may also clearly define the strategies to be used and financial resources to be mobilized for creating the required number of trained staff at all levels

5) Financial Resources

The Federal Ministries of Education, Food, Agriculture and Livestock and Provincial Departments of Education and Agriculture provide funds to agricultural universities, colleges and institutes for their post-graduate research and teaching programs through University Grants Commission and Provincial Agriculture Departments by competing with general universities and the provincial directorates of agricultural research. The universities do not get regular financial support from Pakistan Agriculture Research Council because they are not properly linked with it. The agricultural universities however raise some income through fee etc and selling of agriculture technology to private sector but it is hardly enough to meet the partial administrative cost. There is no mechanism of providing education on major cost sharing basis. The participation of the private sector in financing agricultural education programs except farmer's education at the grass-root level is very marginal. The major agencies having administrative, financial and operational linkages with the Agricultural Universities and Colleges do not provide adequate support for the integrated development of university's education and research system. According to one estimate, the funding for research in universities remained at the mid-sixties level, whereas the cost of equipment, consumables and operation has increased manifold. This has drastically reduced the chances of the agriculture universities to undertake any innovative teaching-learning and research and extension project with even the available human resources to ensure quality of instruction on the campuses, and transfer of agricultural technologies to the farmers for increasing productivity and alleviating rural poverty.

6) Dissemination of Agricultural knowledge and Use of Information and Communication Technology (ICT)

The agriculture universities have libraries and data handling facilities but they are poorly stocked, especially in professional journals, periodicals, reference documents and textual material that focus on Pakistan's background. The equipments for data processing is provided but the trained human resources and software are inadequate. While discussing with different stakeholders, the use of ICT in their education, research and extension programs, it was discovered that most of them were aware of the potential of ICT to help overcome the problem of shortage of trained human resources and establishing linkages between researcher and farmers besides reaching the maximum number within a short period. But they were quite apprehensive about the use of ICT in their programs because of lack of equipment and trained human resources, non-availability of electricity and telephone facilities in the rural areas and inadequate operational funds. They were however willing to try it, provided they were assured of supply of equipment, in-service training of staff and provision of operational funds.

AGRICULTURAL EXTENSION SYSTEM

Agricultural extension serves as a bridge between the agricultural research scientists and the potential users of research findings. It aims at helping research scientists to design and undertake needs and problems based research and at the same time encourages and enables farmers and others to adopt new scientific knowledge and useful research results/agricultural technologies for increasing agricultural production leading to enhanced farm income and better quality of life for all in the rural area. This process of generating new scientific knowledge and information related to agricultural technologies and sharing it with concerned stakeholders through appropriate channels have been presented by FAO and World Bank as a "knowledge triangle" (Figure 1) in their joint publication entitled 'Strategic vision and guiding principles".

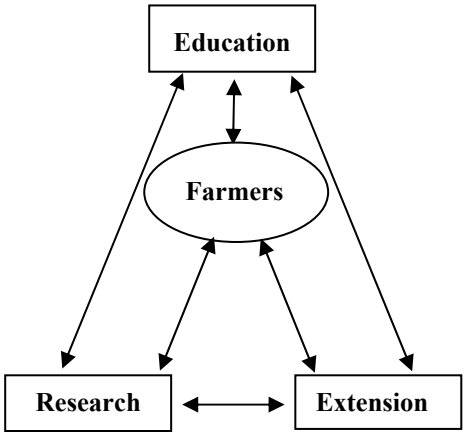

Figure 1. The Knowledge Triangle

From the triangle, it is clear that rural people, especially farmers, are at the heart of the knowledge triangle and education, research and extension are located at the periphery to provide services to the farmers and other members of the rural community. The review of available documentation and discussion with all stakeholders' reveals, that Pakistan has tried almost similar models in its agricultural extension programs with varying degree of success. An attempt is being made in the following pages to examine the nature, scope, and operational strategies tried by Pakistan in achieving its long-term goal of agricultural extension:

1. Organizational Structure

Agricultural extension in Pakistan did not have a separate structure till 1962 when an independent department of agricultural extension was created within the provincial agriculture set up. During the fifties and early sixties, agricultural extension activities were carried out as a component of the integrated agricultural development approach whereby the Professor of Agriculture in the Punjab Agriculture College, Lyallpur (now Faisalabad) also used to act as deputy director agriculture and was responsible for agricultural research, teaching and extension. However, in 1962, the teaching was separated from research and extension with the establishment of West Pakistan Agriculture University (presently known as Agriculture University, Faisalabad). Since then, the agricultural extension work is planned and carried out following a structure headed by Provincial Secretary of Agriculture.

Agricultural extension in Pakistan is a hierarchic top-down system of administration where decisions are taken by the top administration without much involvement of other stakeholders, and implemented by the field staff which does not fit well into the present day requirements of more progressive, intensive and integrated agriculture. The Agriculture Extension Department is headed by a Director General at the provincial level and supported by Director, Deputy Director, Extra Assistant Director, Agriculture officer and field assistant at the regional, district, tehsil, sub-tehsil (Markaz) and Union Council (a group of 5-8 villages) levels respectively. The extension officers at all levels are supported by other professional, technical and non-technical staff keeping in view their expected roles and responsibilities, and are planned to have horizontal and vertical linkages with other operators of agricultural education and research programs.

However, as per Government's devolution plan, program planning and implementation responsibilities with appropriate authority except probably recruitment of personnel and allocation of funds have been decentralized to the district level. In other words, the district has become the focal point for all agricultural extension activities to be planned and carried out with the support of specialists in agricultural research and education.

2. Planning and Implementation Mechanisms

1) Program Planning

The extension programs were planned by the top administration in the light of the priorities determined by the federal and provincial governments. However, the system has now slightly been decentralized in the sense that each district is expected to prepare and submit seasonal (Rabi-Kharif) plans with given targets which are mostly aimed at increasing crop production. While preparing these district plans, agricultural extension personnel consult research scientists and other stakeholders with very little representation of small farmers, through the established inter-agencies, intra-agency linkages which are operationally very weak when it comes to identification of emerging problems and designing actions in response to the technological needs of the farmers.

After reviewing the available documents and having discussions with the farmers and representatives of other stakeholders, the author has reached the conclusion that agricultural extension planning in Pakistan is an example of government controlled program planning where local people and representatives of other stakeholders were seldom involved. Even though the district is made a focal point for planning and implementation, the inter-district linkages have weakened. It may also be fair to say that the district has now become isolated, as it does not have any linkage with other districts even within the same province. It is a supply rather than demand driven program-planning approach. As a result, the feed back to research, and planning is inadequate.

3. Program Implementation

1) Human Resources

Pakistan Extension Service uses a personnel intensive program implementation strategy, largely depending upon face-to-face teaching methodologies with very little use of mass media and information technology. The extension service is expected to cover the entire rural population residing in about 65,000 villages, located in different parts of the country with a poorly qualified/trained and limited number of staff. According to one estimate, in 1993, the ratio between extension worker and number of rural household was 1: 2512. The situation is even worse when it comes to the ratio between male and female extension workers as Pakistan has very few female extension workers.

The review of reports and discussions with representatives of different interest groups further reveals that the curricula for pre and in-service education and training being used by different agricultural

universities and field assistant training institutes were theoretical in nature with very marginal practical exposure. As a result, the graduates from these educational institutes lacked confidence and skills in interacting with the farmers who in general are well experienced and aware of their needs and problems. Lately, University of Agriculture Faisalabad has introduced a one year internship program for final year B.Sc. Agri. Extension students to provide them first hand experience of working in an agricultural organization on one hand and directly interacting with the farmers on the other hand. Looking at the need and the capacities of educational institutions for generating the necessary trained human resources, it is not difficult to conclude that Pakistan will continue to face the problem of shortage of trained personnel for implementing agricultural extension program if steps are not taken to increase the training capacity of agricultural universities, colleges and training institutes. The situation appears to be more depressing when one discovers that students assign lowest priority to a career in extension because of lack of career development and training opportunities, salary, promotion and other financial incentives, transport, housing and health facilities as compared to the privileges and amenities enjoyed/availed by their counterparts who opt for a career in agricultural research and education. As a result, the gap between required and available trained human resources for extension further widens, adversely affecting extension achievements under the traditional personnel intensive implementation strategy.

2) Extension Linkages

Linkages of Extension with agricultural research and education in public, private, NGO's and corporate sectors are well conceived but they are operationally very weak. As a result, the farmers fails to get timely information about available technology packages and other inputs supply requirements such as seeds, fertilizers, pesticides, credit etc., essential for increasing crops and livestock productivity, and the researchers do not get feedback for planning future research activities. The farmers also remain unaware of the modes of effective marketing and processing of their produce in the absence of any agricultural output management system. The introduction of Government's devolution plan has helped to a certain degree to decentralize the decision making power at the district level but the operators of the devolution plan developed some rigidity due to which the inter-district linkages have weakened.

3) Monitoring and Evaluation

Besides, the inadequate planning and weak linkages mechanism, agricultural extension in Pakistan is faced with the problem of absence of a scientifically conceived monitoring, evaluation and impact assessment mechanism that, is one of the elements for establishing communication between researchers and the farmers.

4) Information Dissemination

The provincial agriculture departments have established the bureau of agricultural information manned with qualified staff who manage to produce agricultural information material such as leaflets, booklets, brochures, video tapes and radio programs for effective dissemination of the technology generated by various research stations/institutes. However, the discussions with farmers gave an impression that many a time, there is shortage of printed material, and the radio programs are not properly planned in terms of the relevance of topic as well as the communication capability of the resource persons. These observations were discussed in a meeting with the staff of information bureau and discovered that they are facing the perennial problems of shortage of funds, equipments, transportation facilities and good speakers, which brings negative reflection on their bureau. The National Agriculture Research Council (NARC) is closely associating with the provincial information bureau to help them produce good video and other information material.

The Social Sciences Division of Pakistan Agriculture Research Council (PARC) plans and implements research activities/programs to evolve new modalities for effective dissemination of research results and their adoption by the end users on one hand and provides information about problems/issues faced by the farmers in adopting new technologies and rapidly changing rural life, to the researchers for further investigation on the other hand. This role is being performed by the Social Sciences Division through a network of its six Agricultural Economic Research Units, which have recently been renamed as Technology Transfer Institutes (TTIs) and are located in six agro-ecological zones through out Pakistan. Each of these institutes have a specific mandate which it aims to fulfill in collaboration with the farmers organizations, agricultural universities, colleges, commercial and public research institutes, NGO's and extension organizations/bodies located in the same ecological zone by undertaking the following initiatives: (1) Research in extension methodology; (2) Training of extension agents; (3) Exposure of progressive farmers to sophisticated or special technologies for large scale dissemination; and (4) evolution and testing of innovative approaches to extension. It may however be mentioned that the author while visiting some of

these TTI's, held discussions with the staff and discovered that all of these TTI's need trained staff to handle additional T.T. oriented responsibilities and programs.

The review of available literature and discussions with different stakeholders about transfer of agriculture technologies from researcher to farmers reveals a partial success because of the complex process of establishing linkages and coordination among research, extension, education and farmers organizations and varied human characteristics and behavior of end users of agricultural knowledge, information and technologies. They have, however, succeeded in initiating a process of establishing functional linkages among all stakeholders, undertaken extension methodological research, evaluation/assessment studies, training of extension workers and farmers covering different methodological and substantive areas of agricultural technologies, establishing audio-visual units and documenting, printing and disseminating information on transfer of technologies at all levels.

When it comes to funds, agricultural extension has hardly received sufficient funds to meet its establishment and operational needs. In fact, extension receives the lowest allocation as compared to agricultural research, and education. That is one of the reasons that agricultural extension finds it hard to play an active role to promote dissemination and adoption of innovations in the absence of adequate personnel, institutional and financial support.

5) Agricultural Extension Models/Approaches

Agricultural extension in Pakistan has faced multi-dimensional problems since its inception, and different national and international groups/agencies and experts have suggested a number of models/approaches to help overcome some of these problems to enable agricultural extension to play its role effectively. Some of the major agricultural extension models/ approaches tried with varying degrees of success, with or without foreign assistance are listed below: -

i.	Village Agricultural and Industrial Development (V-AID) program under US AID.	1953-1962
ii.	Basic Democracies Program	1962-1970
iii.	Rural Works Program and Integrated Rural Development Program (IRDP)	1970-1978
iv.	Training and Visit (T and V) Model	1980 onwards
v.	Participatory Model of NGO's (National Rural Support Project)	1990 onwards

All of these models have their strengths and limitations. Along with these models, a number of innovative extension approaches were also tried. Some of the major approaches tried in Pakistan as mentioned in different documents were; (1) Adaptive Research Farms approach, Farming System Research/Extension approach, Private Sector approach, Donor driven extension project (e.g. Barani Agricultural Research and Development), Commodity Specialized approach etc. etc.

An in-depth review of documents on the rationale, planning and implementation of all the above mentioned agricultural extension models/approaches further reveals that most of them were conceived and planned with the help of expatriate experts who prevailed upon the local authorities to conceive ideal extension models which were theoretical in nature and faced problems at the implementation stage because they could not fit into Pakistan environment and the existing system without major structural changes and provision of addition human, institutional and financial resources. As mentioned earlier, Pakistan agricultural extension system was top-down, autocratic and supply driven where as some of the proposed models/approaches required bottom up, democratic, demand driven and participatory situation in order to be successfully implemented. Because of this contrast between the prevailing extension situation in the country and conditions necessary for implementation of new models, Pakistan agricultural extension could not make a significant headway in spite of the fact that most of these models had very good elements, which if implemented, could have helped to reform agricultural extension system in Pakistan.

With the introduction of the government's devolution plan encouraging bottom up, democratic, demand driven and participatory approaches, it is now possible to pick up relevant elements of some of these models/approaches and design a realistic implementable new agriculture extension model within the existing system in the light of the characteristics of the farming communities and rural socio-economic settings, available qualified and trained human resources, institutional facilities, equipments and finances. A beginning in this direction can be made with the in-depth study of some of the models/approaches mentioned above such as Integrated Rural Development Program (IRDP), Training and Visit (T & V) model, Farming System Research/Extension Approach, Adaptive Research Farms approach, National Rural

Support Project (NGO participatory approach), and Idealized Model of Agricultural Knowledge System (presented on next page).

Looking at the untiring efforts made by the national and international community in the public, private and non-governmental/corporate sector to evolve an operational and implementable agricultural extension model for Pakistan, the participants of a national workshop on Reforming Agricultural Extension in Pakistan, jointly organized by FAO, UNDP and PARC, also tried to conceive an idealized model of agricultural knowledge system which has not yet been tried in Pakistan, and is being reproduced below for information, as it presents slightly different components.

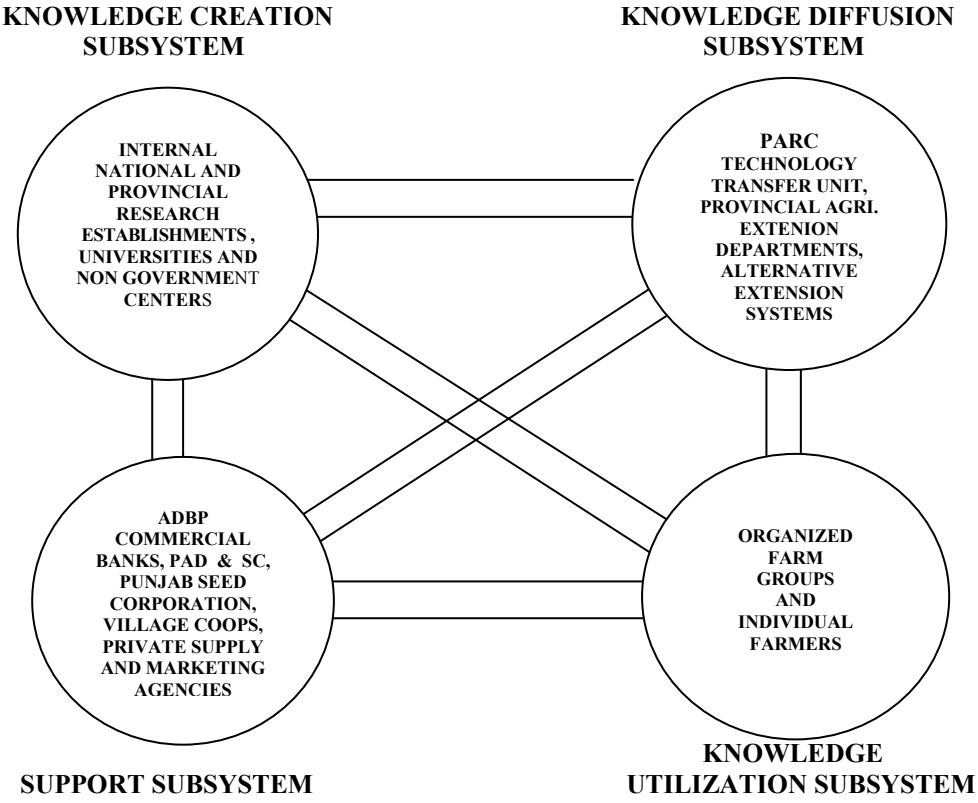

Figure 2. An Idealized Model of Agricultural Knowledge System in Pakistan*

The review of available documentation and discussions with different stakeholders suggests that the agricultural extension in Pakistan is still in its development stages passing through a long transition period. Therefore, concerted efforts are needed to conceive an operational agricultural extension system which is not only relevant to the situation in Pakistan, but also could be implemented with the available human, institutional and financial resources. In the absence of such a system, it would be difficult for the Pakistan Agriculture System to fully achieve its goals.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIONS

Constitutionally, the Federal Government in Pakistan is responsible for policy planning; resource mobilization and inter-provincial coordination for agriculture and education sectors, and the Provincial Governments are responsible for the implementation for all programs. The available policy documents show that Agriculture and Education Policies of Pakistan are highly ambitious and theoretical in nature and lay major emphasis on enhancing per unit productivity, food security, poverty alleviation, human development, and better quality of life for all. Different Federal Ministries and their corresponding line departments at the Provincial levels are main agriculture and education development operators. PARC undertakes, aids, promotes and coordinates agricultural research, organizes high-level training, acquires, disseminates and promotes adoption of newly evolved agricultural technologies. In addition, agriculture universities/colleges/institutes, some NGOs and private/corporate sector organizations participate in the

* SOURCE: Proceedings of National Workshop on Reforming Agricultural Extension in Pakistan; 1993

planning and implementation of agricultural research, extension and education program activities with limited institutional autonomy.

Apparently, all operators of agriculture education, research and extension are aware of their expected roles, but there seems to be some gaps in the perception and actual performance of their roles at all levels. An in-depth review of approaches/strategies applied for policy planning, resource mobilization, program development, financing, implementation, monitoring, and evaluation further reveals that the planning for agriculture, rural development and education is government controlled, supply driven rather than demand driven program planning approach where local people and representatives of other stakeholders are seldom involved, in spite of the recently introduced administrative reforms called "devolution plan" under which the district has been made a focal point for program planning and implementation. The devolution plan is still in its infancy and the people responsible at the district level for implementation of this plan are not yet fully conversant with the philosophy, rational and operational strategies of this system. As a result, the district instead of being a fully functional focal point for program planning has become an isolated entity with no linkage with other districts and organizations even within the same province. Moreover, the feedback to research and planning has further reduced.

Under the present situation of inadequate institutional autonomy, hierarchic top down planning, inadequate coordination among different components of agriculture/rural development system and weak linkages at all levels between research, extension and education, it was observed that the agriculture/rural development system in Pakistan generally faces the problems of insufficient funds, limited number of trained human resources, lack of training opportunities, inappropriate salary scales and promotional prospects, low degree of participation of small farmers and other stakeholders, weak planning, review, monitoring, evaluation, and MIS system, comparatively young program of transfer of technologies and use of ICT, lack of scientific information management skills among senior management and inadequately developed institutional research agenda.

In addition, there are some specific problems related to agricultural extension and education. For example, in agricultural extension, there is a very weak mechanism for micro planning at village, union council, Markaz and tehsil levels to mobilize farmers into different interest groups/organizations for enhancing productivity per hectare and marketing their produce. Similarly, Pakistan is faced with the problem of ideally conceived theoretical models, which do not fit into the local situations with special reference to farmer's organizations, extension infrastructure and available human and financial resources.

Irrelevant curricula, teaching, learning and training material, lack of equipment and physical facilities for practical pre and in service education and training for students/learners in agricultural universities/colleges, field assistants and farmers training institutes are among the top most problems in agricultural education. Moreover, it was observed that agricultural universities at present are performing only a teaching role whereas the other two roles, namely research and extension have suffered a severe setback because of lack of funds and inappropriate linkages with research stations/centers and agriculture extension programs under the administrative control of agriculture departments and corporate sector.

Recognizing the above-mentioned major problems and issues and the need to achieve national policy goals and objectives, the Government of Pakistan has planned and launched diversified integrated agriculture development programs with varying degree of success. As a result, meaningful experiences have been generated which can be used as a basis to learn for planning and implementing future agriculture/rural development programs including agriculture extension services in Pakistan.

Summary of the lessons learnt and suggestions made for future actions are being presented in the following paragraphs:

a) Frame realistic, demand driven policies with achievable targets and firm commitment of resources and prepare corresponding appropriate plans for implementation at the institution, district, agro-ecological zone, provincial and national levels with active participation of all stakeholders including private sector, NGOs and small farmers by organizing them into different interest groups with due representation of women and youth. In countries like Pakistan, where availability of committed funds are uncertain, it would be desirable to prepare long, medium and short term plans envisaging commencement of implementation from short-term plan and gradually proceeding to medium and long term plans dependent on the availability of required human, institutional and financial resources and establishment of anticipated inter-agencies coordination mechanism and inter-disciplinary linkages among agriculture/rural development system operators including the private sector and NGOs.

b) Decentralize existing semi-centralized decision making mechanism by giving administrative and financial autonomy and authority to the lowest administrative level under the devolution plan and at the same time the liberty to use micro-planning strategies for ensuring participation of program

beneficiaries such as small farmers, landless rural poor, youth, women, marginalized groups and other agriculture/rural development operators including representatives of private sector at all levels of planning, implementation, monitoring and evaluation. It would also be highly desirable if the planning process is further decentralized especially in agricultural extension, and independent/flexible plans of action are prepared for each union council, Markaz, tehsil and district. Such a planning approach will easily fit into the government devolution plan and help contribute to its success.

c) Establish a clear line of authority by bringing all the agricultural universities, colleges and institutions under one administrative ministry/department having clearly established horizontal and vertical linkages at all levels with all concerned stakeholders in the public, private and non-governmental sectors and farmers organizations to help overcome some of the major problems/issues confronted by planners and implementers of agricultural research, extension and education including tech/vocational education programs.

d) Link all universities/colleges and districts with each other for planning joint programs of agricultural education, tech/vocational education, extension and research and their implementation on cost sharing basis by establishing inter-district and inter-provincial networking for sharing of institutional, human and financial resources as well as research results and instructional material and information for maximizing the use of available resources.

e) Prepare realistic long and short term human capital development plan anticipating both pre and in service education and training needs, opportunities and facilities and as well as outside the country keeping in view the requirements of agriculture research, agriculture extension and agriculture education areas as foreseen in point 'a' above on one hand and the availability of resources on the other hand. The plan should also provide for recruitment and training of female extension agents and career development, promotion, and incentive to attract and retain qualified scientists/specialists to meet the ever-increasing needs of human resources for agriculture/rural development system in Pakistan.

f) Decentralize to each university/college/institute, the preparation of problems and needs based pre and in-service education and training curricula and teaching/learning and training material with the active participation of all stakeholders in the public and private sectors including small farmers. Moreover, agricultural universities/colleges/training institutes should also be equipped with physical facilities and funds to provide practical training in degree/diploma programs and short courses in selected areas of agri-technologies for farmers in the locality.

g) Mobilize necessary resources to further strengthen existing monitoring, evaluation and MIS for agriculture/rural development system by providing computers and alternate software in addition to training of managers and others in the use of computerized monitoring and evaluation system including MIS.

h) Gradually introduce the use of ICT, keeping in view the available human, institutional and financial resources for transfer of agriculture technologies by developing sound linkages of PARC with agricultural universities/colleges, researchers, farmers organizations and information media in public and private sector to establish a two-way communication between scientists/specialists and the users of research results (farmers).

i) Further strengthen collaboration with the university for organizing more agriculture fairs, adaptive research farms, farmer days, exhibitions, inter-district and inter-provincial visits of students, teachers, researchers, and farmers for mutual learning through sharing of experiences and information related to modern agriculture technologies, and development of participatory and problem solving decision making skills.

j) Establish National Association of Agricultural Scientists on the pattern of Pakistan Medical Association for use as resource agency for preparing relevant curricula and joint sustainable plan to provide practical training facilities to final year B.Sc. (Agric) students on the pattern of medical students who spend the last year of their graduation program as interns in the hospital under the supervision of the practicing doctor.

REFERENCES

Ministry of Food, Agriculture and Cooperative (1980). National Agriculture Policy, Government of Pakistan, Islamabad.

Ministry of Food and Agriculture (1985). National Agricultural Research Plan (1985-86), Pakistan Agricultural Research Council, Islamabad.

Ministry of Food and Agriculture, (1988). Report of the National Commission on Agriculture, National Commission on Agriculture, Government of Pakistan, Islamabad.

Ministry of Food and Agriculture (1989). Research Master Plan 1988-2000, Vol.1, Pakistan Agricultural Research Council (PARC): National Agricultural Research Centre, (NARC), Islamabad.

Ministry of Food, Agriculture, and Cooperative (1991). National Agricultural Policy. Government of Pakistan, Islamabad.

Ministry of Food, Agriculture and Rural Development, (1993). Report of the International Seminar on Integrated Rural Development, Government of Pakistan, FAO and UNDP, Lahore.

Ministry of Food and Agriculture. National Master Agricultural Research Plan (1996-2005), Pakistan Agricultural Research Council, Islamabad.

Ministry of Food, Agriculture and Livestock (2002). PARC Annual Reports 2000 and 2001, Pakistan Agricultural Research Council, Islamabad.

Pakistan Agricultural Research Council, (1993). Proceedings of National Workshops on Reforming Agricultural Extension in Pakistan, FAO, UNDP and PARC, Islamabad.

Pakistan Agricultural Research Council (2002); PARC Human Resources (2002- 2003); Islamabad

Pakistan Agricultural Research Council, (2002). Report of a short-term study on Organizational and Management Study for Institutional Reforms of the National Agriculture Research System with particular reference to PARC, Islamabad.

Government of Pakistan, (1972). The Education Policy (1972-1980) Ministry of Education, Islamabad.

Government of Pakistan, (1979). The Education Policy, Ministry of Education, Islamabad.

Government of Pakistan, (1998). National Education Policy (1998-2010), Ministry of Education, Islamabad.

Ministry of Education, (1999). Pakistan Education Statistics (1997-98), Academy of Educational Planning and Management, Islamabad.

FAO and World Bank, (2000). Strategic Vision and Guiding Principles, FAO, Rome.

Rivera, M.W, and Qamar, M.K, (2002). Agricultural and Rural Extension Worldwide: Options for Institutional Reforms in the Developing Countries, FAO, Rome.

3. INTEGRATED, MULTIDISCIPLINARY AND HOLISTIC RURAL DEVELOPMENT APPROACH FOR EFFECTIVE AGRICULTURAL EXTENSION SERVICES

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INTRODUCTION

> "Max Planck, the originator of the quantum theory of physics, once said that science makes progress funeral by funeral – the old are never converted by a new doctrine; simply replaced by a new generation. In the social sciences it often takes several generations to dislodge obsolescence. In the meantime, serious mistakes can and are made, hurting the lives of millions of hapless people. In poor countries, like India and Pakistan, the mistakes can be costly. And the funerals premature and unnecessary – funerals, not of social scientists, who usually operate from a safe haven, but of the designated beneficiaries of development policies formulated on the basis of faulty premises and paradigms". (Kusum Nair 1979)

Agricultural extension is in crisis throughout the world. The trend towards privatization and downsizing of the public sector, including its agricultural extension services, raises many questions about whether or not agricultural extension – in any form – is in fact obsolete. Even the epistemo-logical foundation of extension, the diffusion of innovations, has been called into question as it fails to adequately illuminate just 'what happens out there' (see, for example, Wejnert 2002). The concern driving the debate is increasingly one of what can be done to help farmers learn how to responsibly and profitably deal with the complex world around them. Nevertheless, the debate is obfuscated by the fact that social change is about prevailing interests and thus it is difficult to disentangle The multiple hierarchies of power (e.g., class, caste, gender, age, etc) that are embedded in specific and frequently contradicting contexts and ideologies. For example, what balance is struck between the need to generate profit and the technical issues of the sustainability of many farming practices such as the inappropriate use of pesticides and irrigation? What is the relation between agricultural and rural well-being? And what are the needs of women, who are important economic actors in their own right, and children, in the generation of the future? Thus, it is important to consider how agricultural extension is conceptualized and then operationalized (including modes of information dissemination) with respect to the various stakeholders of farmers and their families, the wider rural population, the agricultural input industry, government bureaucracies, and non-governmental organizations.

Rural development is a complex process. It is a multi-faceted and multi-vocal site of contestation that requires a measured conceptual approach that modulates variant interests and perspectives. Many approaches to 'get agriculture moving' have been adopted and discarded over the past several decades. Recently, development practitioners have turned to what is termed an integrated, multidisciplinary and holistic approach to rural development (IMDH-RD), stressing the need to address both agricultural and rural issues to create effective and environmentally sustainable development. Explicitly acknowledging what occurs within the broader rural sector is fundamental to the success of agriculture. It implicitly gives primacy to rural populations and what they strive for on the basis of their own understandings. To this end, this paper discursively explores what comprises IMDH-RD in an effort to deconstruct and provide a more reasoned assessment of agricultural extension services. It does so through a reflection on development paradigms, non-formal education, individual empowerment, and institutional pluralism. By calling into question the underlying dimensions of IMDH-RD, it is possible to develop an alternative paradigm and thereby generate new insights into agricultural extension. In short, the *raison d'être* of agricultural extension today must be on making it more inclusive and thus responsive to the needs of farmers and other rural inhabitants, integrating individual expectations with the wider socio-economic, political and geographical environment.

DEVELOPMENT AND AGRICULTURAL EXTENSION: A PHILOSOPHICAL PERSPECTIVE

Social scientists have long been exploring the historical and comparative structure of agriculture and extension delivery in contemporary capitalism (Rivera and Zijp 2002; Swanson et al. 1997). One important theme underlying this debate, albeit often overlooked, concerns the demise of civil society; in this case, what constitutes a public good. John Saul (1992) argues that civil society is being destroyed by the implementation of a specific set of policies arising from the neo-liberal revolution; namely, the emergence of 'economic rationalism' and partisan ideology. Writing more from the perspective of the market, others such as Milton Friedman (1980) evoke the image of the state as an inefficient intruder into individual choice, an impediment to human liberation.[1] However, it is important to note that debates about the demise of civil society are not simply about the mechanics or rhetoric of contemporary transformations in capitalist social formations (see, for example, Marsden and Murdoch 1998; Davidson 2001). At the forefront of this debate are contested images of what constitutes the 'good society', and the types of social relations and associations upon which it should be based (Hyden 1997; Blim 2000).

What does this portend for the analysis and understanding of agricultural extension/rural development and the role of the state? Can we readily abandon the notion of the social or civil society since it constitutes an important cornerstone of philosophical discourse, especially as it relates to the 'public' role of the state (i.e. the welfare state)? The debate, however, is not as clear-cut as it may seem except at the extremes of governance (*laissez-faire* and communism). Whatever the various perspectives lane in common, what is of concern is the outcomes accompanying contemporary patterns of social change (Dean 2002). This takes on new meaning when viewed from Beck's (1992) notion of "risk society" where people must now learn to deal less with the distribution of welfare (*public goods*) and increasingly with the distribution of risks (*public bads*). In other words, it is about questions of responsibility for the effects of problems and about the question of decision-making competency on risks for humans and the natural environment.

What is required is more informed understanding based on solid empirical evidence, moving beyond rhetoric[2] to a new conceptual understanding. In modern times, we are faced with a phenomenon that is evidenced by the pronounced shift from citizen rights to privileges and from citizen inclusion to exclusion.[3] What can we expect with the dismantling of the welfare state across the globe and what future do we envisage for the next generation? In this respect, information is a case in point (see, for example, Wolf 1998). In increasing the commercialization of information, what is the nature of public good? At which point does information cease to be a public good and become private property, a commodity to be bought and sold like any other? And at what point are the costs of obtaining information advice off-set by social (and individual) needs, including environmental well-being? For example, what rights do smaller-scale or resource-poor farmers have in obtaining information or have they become so redundant that the present scope of privatized extension will facilitate their move to other sectors of the economy?[4] Or do we simply take refuge in related education theories that assume students have equal and ready access to all information (Brabazon 2001). Notwithstanding the merits of new educational theories, participatory inquiry and citizen empowerment are laudatory aims but simply invoking those ideals does not necessarily resolve problems associated with distortions of power (Habermas 1984). Intentions must be realistically assessed.

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1 In general, economists only consider "that there is a function for regulation only in the case of market failure … when the market process does not lead to an efficient allocation… In substantial terms, market failure arises when the market does not lead to an efficient allocation" (Traxler and Unger 1994: 1). A second form, social – unjust income distribution – receives little consideration from economists.

2 It is assumed that deregulation and privatization will usher in competition and efficiency while laying the groundwork for increased incomes and prosperity. While not denying that this may be a possibility, there is nothing that ensures that economic liberalization will maximize a country's comparative advantage in primary goods or enhance rural incomes (for an example of this, see Gow 1994). According to Ravenswood (1998), "Privatization really amounts to asset stripping by stealth. This push for privatization has come from the corporate sector, not from the public'. Furthermore, 'apart from the economic benefit of gaining access to [public] invested capital, the corporate sector also stands to increase its political power through privatization."

3 One of the more evident aspects of the new liberal philosophy is the stress on 'user-pay' and 'cost recovery'. If nothing else this provides strong indication of the future of the welfare state; namely, none. Medical care is a case on point. Few would argue that is not an essential element of a modern society, yet many individuals must do without proper care – and this in Western democracies such as the United States.

4 This is problematical in many industrializing countries as it is doubtful whether or not 'surplus' rural population can be absorbed into the urban economy through job creation.

AN ETHICS OF EXTENSION/DEVELOPMENT: TOWARDS A MULTIDISCIPLINARY AND HOLISTIC APPROACH

The establishment of agricultural extension in the modern era has its origins in the need to promote agricultural production and productivity.[5] One of the criteria of a successful extension strategy is its ability to produce intended results. From the government's perspective, extension was considered to be a central policy tool for promoting economically and environmentally sustainable farming practices (Davidson and Ahmad 2003). (It is unclear, however, how government perceives sustainability, particularly in relation to the economic profitability of business enterprises.) Unquestionably, the need for agricultural information and advisory services – however envisioned – will intensify in the foreseeable future. In most regions of the world, agriculture faces the difficult task in keeping pace with rapidly increasing populations with few reserves of potentially arable land (Garforth 1997). Whatever form these services take has far reaching implications for "the role of government, the question of information as private property, and the purpose and audience to be served …" (Rivera 1993: 2). In other words, how will (and if) issues of equity be addressed, accountability and transparency assured, and environmental sustainability ensured?[6]

While over viewing the development literature (including extension) one is left with a strong sense of *déjà vu*. Much of what is currently being written about development and its practices strikes a chord which resonates back to earlier times. In 1962, for example, Kusum Nair's path breaking book *Blossoms in the Dust* illustrated the effects of local culture on economic development in India. Ten years later Owen and Shaw in *Development Reconsidered* arrived at similar conclusions, while, as the title suggests, Schumacher's *Small is Beautiful: a study of economics as if people mattered* left no doubt as to the quintessence of development. Then too there were meaningful descriptions and strategies to promote development, evident in a host of adjectives and modifiers such as appropriate technology, women in development, sustainable development, integrated rural development, participatory development, and so on. So why has life become more difficult and onerous for a great number of people across the world?

Nearly fifty years of efforts to stimulate and foster development have met with mixed success. In short, the overwhelming belief that free and unfettered markets will ultimately reduce poverty, reduce inequality, and address urgent problems of environmental degradation continues to shroud development. Little seems to have changed from Lewis' (1955) dictum of the 1950s that the subject matter was about "growth, and not distribution". If nothing else, the extreme excesses of corporate avarice over the past two decades[7], the growing gap between rich and poor, and the threat (or reality) of global warming are testimony to the magnitude of the problems we face. Somewhere, the ethics of development keep getting lost, resurface and are lost again. Difficult questions must be asked and hard decisions made that will have far reaching consequences in shaping the economic, political, social, cultural, and natural environments in which we live. We believe this is possible and necessary. As Raiser 1997: 54) so eloquently states, "The human ability to reason and criticize is the driving force behind human progress."[8]

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5 For an insightful overview of the history of agricultural extension see Garforth (1997).

6 Notwithstanding, or because of these concerns, the delivery of agricultural extension across the globe has been moving towards privatization, particularly since the early 1980s. In the discourse of public policy, these reorganizational initiatives are prefaced in terms of "competitiveness, productivity, efficiency, and quality" (McDonald 2001: 247). The literature on the privatization of agricultural extension in industrialized countries is voluminous and extensive (see, for example, Wolf and Zilberman 2001; Carney 1998; Rivera and Cary 1997; Rivera 1993). With the exception of macro-oriented studies, however, insufficient attention has been accorded to the impact of these policies in postcolonial countries, particularly studies that systematically document issues of effectiveness, access, and organization of services with an emphasis on the end users, the farmers. What may work and be appropriate in the U.S. or U.K. does not necessarily (and probably will not) work in poorer countries such as Pakistan or the Sudan (see, for example, Qamar 2000; Anderson et al. 2000). There is cause for concern since the impact of privatization will probably be felt hardest is poor countries given the existing gap between rich and poor farmers, the fact that small and medium-scale farmers make up the bulk of farming populations, and the seemingly intractable problem of low productivity.

7 The recent corporate collapses (e.g. Enron, WorldCom, HIH Insurance, and One Tel), for example, in two different Western economics, the United States and Australia, fuelled by 'cooking the books' are ample evidence of corporate avarice and wholesale mismanagement. And if it is difficult to 'get it right' in those countries, why should we expect anything different in, say, Pakistan, Columbia, Samoa or Kenya?

8 More importantly, "because the normative goals shaping the process of human progress – are socially contingent [social constructions], a development ethic cannot be derived a priori from first principles ... [it] necessitates a continuous process of normative re-examination and transformation" (Raiser 1997: 54).

Before exploring extension alternatives, outlining recommendations, and stating conclusions, it is best to draw back and locate agricultural extension in the wider theoretical framework of development. Though not couched in terms of extension, Amartya Sen's (1999) understanding of development is worth considering as it clearly articulates the means and goals of (planned) social change and thus is an important contribution to this literature. Originally prepared as a series of discussion papers for the World Bank, *Development as Freedom* directly challenges the shibboleths of development economics. Sen quickly departs from longstanding economic thought (that also guides extension activities), taking issue with development fetishism and its rigid focus on economic growth to the exclusion of the economic well-being and political freedom, or more aptly phrased, *unfreedoms* that leave people little choice and opportunity to exercise "their reasoned agency" as "citizens and participants in the social, political and economic life of the community." To this end, Sen presents a wide-ranging account of development that integrates ethics, values and economic theory, drawing inspiration from what the anthropologist Claude Levi-Strauss termed *bricolage*, or bringing together diverse ideas in a way that exceeds the boundaries imposed by conventional wisdom.

The debate over development, as Sen so lucidly shows, is not simply about the mechanics or rhetoric of transformations within capitalism. At the forefront are contested images of what constitutes *the good life* and how development should be "expanding the real freedoms that people enjoy." Sen is particularly concerned with the types of social relations, institutions, and human values upon which freedom is conceived, both as the means to and as the goal of development. It has been commonly assumed that checking social and political rights is a luxury that society can ill afford until some critical level of economic prosperity is first achieved. According to Sen this is clearly wrong. To the contrary, Sen argues that both social and political freedoms are in fact conducive to economic growth (also see Raiser 1997). Located within this perspective, *Freedom as Development* can provide an expansive reflection on the relationship between development and extension.

Development and its supportive norms comprise some of the more puzzling ontological *scapes* in social theory, especially the enigmatic division of economy, society, culture and polity, as well as between structure and agency (see, for example, Grillo and Stirrat 1997). Discourses on development have been framed from both within a modernist framework of grand narratives and total structures, and from within postmodernism, which argues for the primacy of location and diversity through an actor/agency approach. It appears that in Sen's view, development is both but with an emphasis on individual freedoms characterized by people having the "freedom to lead the kind of lives they value, and have reason to value." Sen makes clear that market freedoms by themselves are insufficient to the task at hand – individuals are not free if they suffer hunger, illiteracy, homelessness or illness. Nor does he naïvely accept what he calls the new superstition of absolute faith in market solutions. Sen argues strongly for the role of the state, especially in addressing issues of education, health, social assistance, and unemployment. In short, the 'welfare state', although this is never clarified nor are policy prescriptions adequately fleshed out.

The dominant theme running throughout Sen's book is quite simple; people's social and economic circumstances or freedom determines what goes on their plate, clothes their bodies, fills their minds, listens to their complaints, heals their illnesses, and heeds their concerns. But therein lays the rub. To achieve development requires the removal of poverty, tyranny, the paucity of economic opportunities, social deprivation, neglect of public facilities, and the mechanisms of repression. Successful development captures the complex inter-relatedness of economic, social, political and cultural variables and requires that all are addressed in some type of simultaneous fashion. These freedoms are interconnected and together provide a synergy to generate and sustain development. It is a much needed, albeit daunting endeavor.

While this may be news to those bunkered within the World Bank,[9] for most social scientists and development practitioners, he is 'preaching to the converted'. But that is probably the merit of *Freedom as Development*. Sen may be repeating well known homilies but as a respected economist and Nobel recipient he is a much needed credibility agent when, alas, most social scientists are not. Themes of empowerment, equity and choice have been around for many years; sadly few seemed to listen. Nearly 30 years ago Geoffrey Currey (1973) proved all too prescient when he wrote:

> But *development* is basically about people, and it ought to be defined as such. In this sense, *development* could be defined … as the expansion of opportunities for the realization of human creative potential, the giving to all its members of society the greatest possible latitude for the exercise and expansion of their faculties. It is a liberating process of change.

9 For a penetrating criticism of the World Bank, see Susan George and Fabrizo Sabelli (1994), *Faith and Credit: The World Bank's Secular Empire* (Penguin Books).

What has this to do with agricultural extension? Everything. If extension services across the globe have proved ineffective in reaching the broad mass of farmers it is time we seriously questioned the paradigms upon which such programs are based and ask the difficult questions. How exactly do we translate development theory into extension practice? In the end, a multi-pronged strategy for effective extension (and rural development) is a daunting endeavor but worth the effort.

Outside of a rather narrow range of activities, a cursory review of extension programs reveals cause for concern with the present operation of both public and private agencies. (Davidson and Ahmad 2002; 2003). As summarized by Kidd et al.'s (2002: 95) general assessment of extension:

> Agricultural extension is widely regarded as playing an important role in improving agricultural systems worldwide and its provision has been seen for many years as a principle responsibility of the state. Large public administrations, hierarchically structured and staffed with permanent employees fulfilling various roles and functions were thought to maintain a broad impact and equity in treatment of clients, while also providing a firm regulatory system. However, the general feeling is now that for offering services to farmers and adequately addressing their needs, these administrations are too inflexible and unresponsive, with the high cost brining insufficient benefit.

The privatization or commercialization of extension may be useful but this will require tested strategies that are location specific, multi-dimensional, integrated, holistic, and, most importantly, flexible if resource-poorer farmers are to benefit from these changes. They will also be gradual and take a long-term perspective of social change.

EMPOWERMENT AT THE MARGINS: PARTICIPATION AND ACCOUNTABILITY

Despite decades of extension efforts, the majority of farmers continue to struggle at the margins, removed from economic, political, and cultural centers. Their livelihoods are complex and have to adapt quickly to unpredictable economic and environmental changes (Petty and Scoones 1995: 157). If there is to be any appreciable difference in their lives, the debate over the efficacy of agricultural extension should be prefaced with what can be done to empower farmers and their families to effectively develop livelihood strategies to manage the complexities they encounter in their daily lives. Who provides that help is secondary at best. But what is important is how that assistance is organized, including the processes used to implement it. In other words, what type of help do farmers need, linking the process to a desired and observable outcome? This brings us back to the need to clearly articulate a development ethic. Ethical deliberation is, after all, an important part of human choice (Raiser 1997).

Whether privatization or any other strategy to boost food production will further stimulate agriculture and alleviate rural poverty depends on the economic, political, and cultural rules that people make, as well as their long-term relation to the physical environment. These rules determine who benefits as a supplier of production inputs, whose land and crops prosper, who gets the food and at what price, and how productive the land remains. Unquestionably, great strides are being made providing services and information to people previously 'included out' of government and commercial extension programs (this workshop is testimony to that). Most remarkable have been efforts of NGOs that broadly promote development in the following framework:

> The NGO Forum is founded on the belief that broad based, nation-wide, citizen participation is necessary for sustainable national development, and its mission is predicated on structured citizen action through civil society organizations. Further, it is the belief of the members of the NGO Forum that civil society organizations have an equal, and as important, role as the government and private sector in national development; and that civil society, along with government and private sector, should work towards a tripartite approach to national policy making.[10]

What most NGOs seem to also have in common is a commitment to working with the economically impoverished living in small towns and villages, particularly those that are marginalized, and those whom history has forgotten.[11]

10This statement is taken from the Malawi SDNP, a UNDP funded Malawi Government Programme (http://www.sdnp.org.gy/ngo/about.html).

11 Similarly, Global Volunteers (2002) argues that "A community awakened to the possibility of achieving their collective hopes and reams is a powerful force, a force which holds promise of new life and self-reliance."

In recent years, participatory approaches to development have become widely embraced within the development aid industry. These approaches are intended "to enable those individuals and groups previously excluded by more top-down planning processes, and who are often marginalized by their separation and isolation from the production of knowledge and the formulation of policies and practices, to be included in decisions that affect their lives" (Kothari 2001: 139). Two key words in the World Bank's strategy of participation are "stakeholder" and "transformative" (Nelson and Wright 1995: 6). Both relate to development as means and as end goals,[12] and as such are both a process and a normative statement of what ought to be. Social change is thus not only structural but behavioral. Two key measures of participatory approaches, according to the African Development Foundation (2002), are power of ownership and willingness to be accountable.[13]

STUDENT-CENTERED, PROBLEM-BASED, AND AUTHENTIC: TOWARDS A PEOPLE-CENTERED APPROACH

There are numerous recommendations and 'how-to guides' detailing with the intricacies of initiating and sustaining participatory development (Chambers 1997; Nelson and Wright 1995). Most involve some form of (adult) learning theory as a way of enabling people to take control of their lives through consideration of how adults learn and, more importantly, how adults teach other adults (Riehl 1996; Rivera and Walker 1984; McKenna 1984). Carter and Curtis (1994) reason that adults are active learners who construct knowledge through interaction with things, ideas, and other people (also see Sillitoe 1998). It is in this respect that we briefly look at elements of learning theory for their relevance to extension as education and as a technique to facilitate participation, inclusion and empowerment (Mgumia and Ruheza 2001; United Nations University 1999; Eldis 1998).

The mere acquisition of information in itself does not bring about the changes advocated by adherents of participatory development. What does, is the way people access and acquire information (Biggs 1999). According to Rogers (1995: 5), the diffusion of innovations is "the process by which an innovation is communicated through certain channels over time among the members of a social system." In the 'old school', diffusion was accomplished through the passive absorption of information; in the 'new school' this is achieved through the active participation of farmers (as students) in the learning process. Although derived from 'formal academic' education, three elements of learning theory – student-centered learning, problem-based learning and authentic assessment – have a significant bearing on extension as a mode of education. It should also be noted that elements of these theories are already in use by a number of NGOs.

Student-centered learning involves the interaction of a group of students who experience creative learning to be used in the 'real world' (Thornburg, 1995). In terms of extension, farmers experience creative learning based on their situations and needs. Students (farmers) are thus the focus, and the teacher (extension agent) assumes the role of facilitator or guide (Alley, 1996). Learning environments that allows for social interactions, respects diversity, and encourages flexible reasoning and social competence provide an opportunity for perspective taking and reflective thinking (APA 1997; Biggs 1999). Problem-based learning is "characterized by the use of clear, measurable goals and student outcomes, and the direct involvement of learners in activities that produce deeper understanding of the content through the development of skills that are readily transferable to life and work."[14] Problem-based learning, like student-centerd learning, is an instructional strategy that promotes active learning. Problems form the organizing focus and stimulus for learning and provide a vehicle for the development of problem-solving skills. New information is acquired through self-directed learning. Lastly, authentic assessment presents students with 'real-world' challenges that require them to apply their relevant skills and knowledge. Most notably, authentic assessment is relevant to extension as it:[15]

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12 Another example is USAID which defines participation as: "the active engagement of partners and customers in sharing ideas, committing time and resources, making decisions, and taking action to bring about a desired development objective. Participation describes both the end and the means; both the kind of results we seek, and the way that we, as providers of development and humanitarian assistance, must nurture those results. It underlies two ... core values: customer focus and engagement of partners and stakeholders through teamwork." (http://www.usaid.gov/about/part_devel/)

13 http://www.adf.gov/bpCES.html

14 http://www.west.asu.edu/vision/learner.htm.

15 http://www.funderstanding.com/authentic_assessment.cfm

- Requires students (farmers) to develop responses rather than select from predetermined options;
- Elicits higher order thinking in addition to basic skills;
- Synthesizes with classroom (field) instruction;
- Uses samples of work collected over an extended time period;
- Stems from clear criteria made known to students (farmers);
- Allows for the possibility of multiple human judgments; and,
- Teaches students (farmers) to evaluate their own work.

Together, these attributes can engender participation, inclusion and empowerment. What such an approach enables is a better alignment of the rhetoric and practice of extension or the diffusion of information. Ironically, although extension agents (as in fact many development practitioners) are engaged in 'teaching', they have little or no background or experience in this area. While certainly not a panacea in itself, more innovative teaching methods can provide a better foundation for extension activities. If nothing else, we can begin to appreciate better why extension is currently not always up to the task at hand.

PLURALISM: TOWARDS AN INTEGRATED APPROACH

The impetus to facilitate and ensure farmers' (and other rural inhabitants) active engagement[16] in rural development is driven by an understanding that the socio-economic, cultural, and agro-environmental conditions of farmers is complex, diverse and prone to risk, and that conventional paradigms, based on research stations trials followed by unidirectional technology transfer, have failed (Farrington 1998; Davidson et al. 2001). Agricultural development takes place in a very heterogeneous farming community marked by a wide diversity in farmer types and farming styles. For this reason, extension services are currently conceptualized and delivered in a number of different forms and by a variety of agencies. This will continue in the foreseeable future. The question then is how to prevent wasteful duplication and unnecessary expenditures of scarce resources while meeting the needs of the broader farming community (Davidson and Ahmad 2003)?

Pluralism recognizes both the heterogeneity of the farming community and the need for diversity in extension service delivery systems. Several factors are responsible for the involvement of so many actors into agricultural extension, including scarce government funds, removal of agricultural subsidies, structural adjustment reforms, withdrawal of public extension in the provision of inputs, inadequate extension coverage, expansion of markets, and recurrence of disease (e.g., malaria and dysentery). A primary problem and challenge in instituting a pluralistic agricultural extension mechanism is its coordination among various agencies (Qamar 2000).[17] Failure can have devastating results, not only for farmers and their families but for the credibility of the agencies as well.[18] Therefore, the challenge for government is how best to coordinate the activities undertaken by public, commercial and NGO agencies in order to meet the needs of farmers with varying resource requirements and social arrangements, and who live in diverse locations. According to Christoplos and Nitsch (1996), pluralism focuses on the interface of farmers, extensionists, input suppliers, and a host of other actors in rural development. There are two choices in how best to manage this mix of public, commercial and NGO interests; encouraging federations and networks, or by implementing strategic changes from the center (i.e. central government) (Petty and Scoones 1995). Optimally, at least for now, a middle path seems more appropriate (Barandun 2001).

16 In other words, including farmers **in** rather than including them **out**.

17 According to a study conducted on extension delivery systems in Lebanon (Kharrat and Fleifel 2001):

> The example of commercial company introduced in this survey, showed that they are doing good extension and research activities, ***but they all directed to promote the sales of their products only***. As a result they are ***monopolizing*** their products and ***exploiting*** the farmers to their interests, and in particular because they are the only ones who are providing credits to the farmers. And what is aggravating the situation is the absence of the public extension service, absence of public credit institutions, and weak supervision and control of the government (MOA).

18 In the Nuba Mountains region of the Sudan, for example, the government's Western Sudan Agricultural Research Station was undertaking field experiments in household gardens in several villages in the mid 1980s. During that time two NGOs came through the area distributing seeds which the villages planted in these gardens rendering the tests worthless. The government could ill afford to run the tests a second time.

RECONSIDERING PARTICIPATION, POWER, AND PLURALISM

Although the emphasis on participatory approaches to development is a worth while effort, there is nothing automatic about it that will ensure the desired or intended outcomes. As Francis (2001: 86) cautions in *Participation: the new tyranny*, "The rise of social development has been accompanied by a subtle, but fatal slide from the structural to the cumulative and from substance to process." It is far from clear how increased attention to participatory approaches is reflected in actual operations in the long term (see Cooke and Kothari 2001 for an insightful assessment of participation). In the short term it appears that participation is increasingly about process. In terms of extension, learning is construed as adaptive management, and thus is reactive rather than active. Simply linking participatory approaches to theories of learning cycles is insufficient in generating long-term change. Furthermore, some farmers do not want to become experimenters, triallers of innovations that may or may not work. Their time is stretched and their safety nets are thin. Others continue to prefer the extension agent to tell them what the best practice is. Still others have different normative values of what participation is and 'whose reality counts' (Chambers 1997).[19] The point is participatory approaches will take time, effort and financial support if they are to succeed in the long haul of development. There is also no universal process or practice to ensure its success. Participatory approaches must therefore recognize the consequences of participation and that it will mean different things to different people.

Of greater concern in exploring the modalities of participatory approaches is with the conceptualization of power. As Kothari (2001: 152) reminds us "an understanding of theories of power, social control and performance borrowed from disciplinary traditions ... may offer some insights into the ways in which power, embodied in knowledge and the forms of its accumulation, affects the processes and findings of participatory research and planning." Too often power is conceptualized as a zero-sum game between the powerful (e.g. center, government, extension agent) and the powerless (i.e. periphery, ruled, farmer).[20] To the contrary, the distribution and exercise of power is never so clear-cut or arbitrary. Taking the lead from Foucault's (1980: 98) decentered notion of power, we see that power is everywhere at once, "employed and exercised through a net-like organization." In this account, power must be continuously reproduced as wherever there is power there is resistance (Foucault 1979).[21] And by delineating the workings of power, it becomes possible to locate and theorize oppositions, resistance, and negotiation. In other words, detailing the social relations linking the various stakeholders and thus areas for maneuver.

What such an understanding of power portends is its "everyday nature as expressed in people's daily lives than a focus on institutions and structures of power can reveal" (Kothari 2001: 144). This requires an informed assessment of the locational and positional aspects of power at various levels. Through a 'vertical slice' approach, for example, it is possible to connect the local to the regional to the state and beyond. Individuals and groups exhibit different capabilities and resources at the various levels which has import for an informed understanding of participation. The challenge here is to enable people to gain access and treatment as 'equal partners' at different levels of decision making (Nelson and Wright 1995).

Despite the best intentions and commitment to participation and broad based development, rural development programs are not always successful and for a number of reasons. Landcare in Australia has been held out by many as a success case of participatory and sustainable environmental development by such notable extensionists as Neils Röling. Landcare is a community-based, participatory, sustainable development policy implemented to deal with issues of land degradation (Ewing 1996).[22] The philosophy of Landcare is ostensibly one of facilitation where Landcare coordinators assist in setting up Landcare groups with a goal of getting landholders actively involved in repairing degraded land. Extension-type activities have been a major component of this program.

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19 As Cooke and Kothari (2001: 14) make clear, "This confirms, for us, that we were right to discuss participation in terms of its tyrannical potential, remembering that tyranny is precisely about the illegitimate and/or unjust use of power. The question is ... whether this potential can be overcome."

20 As Nelson and Wright (1995: 9) point out, "early studies treated *power over* as a *thing* of which there was a finite amount in a closed system ... this was phrased as A has power over B."

21 Despite the theoretical sophistication of many studies, there is a tendency to romanticize resistance (Abu-Lughod 1990). Farmers are conceived of as either passive victims or as overthrowing the system (e.g., peasant rebellions).

22 According to Lockie (1997: 2), one on the more interesting aspects of Landcare is the difficulty in stating exactly what Landcare is! As such, "confusion and conflict over the meaning of Landcare is one of the more interesting sociological features."

Close inspection of Landcare in practice reveals problems that may be of relevance in reconceptualizing and reconfiguring extension. Landcare has been in existence for over a decade and has brought about significant changes in the attitudes of landholders (farmers) with regards to the need for conservation farming, sustainable land management, and sustainable agriculture. Despite an estimated 2200 Landcare groups across Australia, however, only about 40 per cent of farmers are actually involved in Landcare.[23] Landholders opting out of Landcare include those not wanting the government to dictate how private land is managed, those uninterested in what they consider as token programs that are unable to fix land degradation problems, and others who traditionally are not included in such groups (e.g. smallholders, women and non Anglo-Celtic ethnic groups) (Lockie 1997). According to Ewing (1996), the concepts of community, ownership, and empowerment are, in practice, ambiguous and thus difficult to operationalize. Landcare is no different. Taking a more critical perspective, Vanclay (1997: 1) contends that "Landcare, far from being the bottom-up, community driven, self-facilitated and empowering process that the rhetoric would have us believe, is a classic example of hegemony at work."

Some of the difficulties experienced by Landcare inhere in its inception and transformation over the last several years. Landcare was essentially established as a means to transfer responsibility for land degradation from government to landholders (farmers) as part of a general philosophy of smaller public service and cost sharing with beneficiaries.[24] At the same time, more groups espousing environmental concerns have been included under the umbrella of Landcare such as OfficeCare and Urban Landcare. This has tended to dilute and factionalize the Landcare mission while intensifying the struggle for project funding. As a result, Landcare has been deeply politicized, particularly by powerful lobby groups and corporate sponsors who exert a disproportionate influence on the conceptualization of environmental problems and means undertaken to resolve those problems (Vanclay 1997). Lastly, many of Landcare's projects are dollar induced so that, for example, when money is not forthcoming, farmers cease to implement reclamation measures. Australian farmers after all, like most other business people, are pressured by short-term economic necessities. While their intentions maybe founded on environmental concerns, their livelihood strategies are directed by immediate economic necessity. In short, the participatory bottom-up approach advocated by Landcare is problematic. And if this is the case in Australia, why should we expect anything different in other countries? Nevertheless, it does have value for a clearer understanding of rural development in a pluralistic society, as well as pointing out the need for accepting different models and methods of practice.

CONCLUSION AND RECOMMENDATIONS

A revitalization of 'traditional extension' such as the T and V system is unlikely and ill- advised, though we should not favor the emergence of an elitist pluralism whereby only resource rich farmers are assured of access to information and innovative practices. There is a middle approach in line with what Sabel (1989: 17-70) terms "flexible specialization" with an emphasis on segmentation, equity, and integration. This approach entails vertical decentralization using flexible resources, including adaptable and appropriate technologies and education. Nevertheless, as Hirst and Zeitland (1991: 45) make clear, the core of flexible specialization policy (or approaches to development and extension), must create and sustain those institutional patterns that lead people "to cooperate one with another as well as to compete." To this end, extension stakeholders must be concerned with stimulating broad-based support for policy initiatives and encourage active engagement.

So too with the reality and rhetoric of IMDH-RD. Within this or any extension paradigm it is difficult to envision substantive change and regardless of what extension system or model is deployed unless these are tied to what Dudley Seers, Geoffrey Curry and Amartya Sen respectively term "potential of human personality", "human liberation" or "human freedoms". How can we expect farmers, for example, to place concerns for the physical environment over the harsh realities of the economic environment? In other words, the livelihood strategies of many farmers and their families (including women), particularly those that are more resource-disadvantaged, are predisposed towards short-term economic realities than towards long-term sustainability, and for obvious and necessary reasons. In this case, what do we really expect development practitioners such as extension agents to do? An approach such as IMDH-RD will require farmers, extension agents, input supply dealers, researchers, policy makers, and so on to focus their efforts, activities, and programs on encouraging a sustainable agriculture that is inclusive rather than

23 I appreciate the forthright discussions I have had over the past several years with Dr Bert Jenkins, then with Greening Australia, on various rural development topics including Landcare and agricultural extension practices.

24 In Australia this is associated with liberal governance or what is termed economic rationalism (Davidson and Grant 2000).

exclusive. Unquestionably, an integrated multi-disciplinary holistic approach to effective agricultural extension is laudable but without linkages to substantive issues of who benefits and who does not, the state of the physical environment, as well as what ought to be (normative values), the cycle of despair will continue. While certainly food for thought for extension practitioners, research scientists, and policy makers, bold new innovations in extension services are required that are linked with rural concerns that not only facilitate agricultural production and productivity but foster rural well-being as well, including that of women and children.

What will an IMH-RD for Effective Agricultural Extension Services entail?

- Sufficient levels of technical and institutional capacity to be put in place;
- Strong support from all the actors involved; as well as ongoing coordination and negotiation in order to find common ground among multiple (and often competing) stakeholder interests;
- Extensive research, analysis and monitoring to create the necessary links between diverse project components and to track a project's progress and impact over time;
- Recognizing the need to attack the root causes of poverty instead of merely treating its symptoms;
- Emphasizing that poverty reduction needs to promote long-term sustainability and avoid dependency; and
- Adopting a comprehensive approach to poverty reduction that emphasizes the importance of enhancing people's overall well-being, and empowerment.

REFERENCES

Abu-Lughod, L. (1990): 'The Romance of Resistance: Tracing Transformations of Power through Bedouin Women', *American Ethnologist*, vol.17, no.1, pp.41-55.

Alley, L. (1996): 'Technology precipitates reflective teaching: An instructional epiphany', *Change*, vol.28, no.2, pp.49-55.

Anderson, J., Cook J. and Bontatitus, E. (1996): 'A Tool for Trouble-Shooting Forestry Extension' in *Developing Countries and Countries in Transition: The Development of an Easy-to-use Document and Electronic Guide*, Food and Agricultural Organization, Rome, Italy.

American Psychological Association, (1997): 'Learner-Centered Psychological Principles: A Framework for School Redesign and Reform', *American Psychological Association Education Directorate*, [online], Available:http://www.apa.org/ed/lcp.html [2002, March 4].

Barandun, A. (2001): 'Developing a Mix of Public and Private Rural Extension Services', *BeraterInnen News*, vol.1, pp.16-20.

Beck, U. (1992):*Risk Society; towards a new modernity*, Sage Publications, London.

Biggs, J. (1999): 'What the Student Does: Teaching for Enhanced Learning', *Higher Education Research and Development*, vol.18, no.1, pp.57-75.

Blim , M. (2000): 'Capitalism in Late Modernity', *Annual Review of Anthropology*, pp.25-38.

Brabazon, T. (2001): 'Internet Teaching and the Administration of Knowledge', *First Monday*, vol.6, no.6, pp.1-13, [online], Available: http://www.firstmonday.dk/issues/issue6_6/ brabazon/index.html [2002, July]

Carney, D. (1998): 'Changing Public and Private Roles' in *Agricultural Service Provision: A Literature Survey*, Overseas Development Institute, London, England.

Chambers, R. (1983): *Rural Development: Putting the Last First*, Longman, London, England.

Chambers, R. (1997): *Whose Reality Counts: Putting the First Last*, Intermediate Technology Publications, London, England.

Christoplos, I. and Nitsch, U. (1996): Pluralism and the Extension Agent: Changing Concepts and Approaches in Rural Extension, SIDA, Stockholm.

Cooke, B. and U. Kothari. (2001): 'The case for participation as tyranny' in *Participation: The New Tyranny?*, eds B. Cooke and U. Kothari, Zed, London, pp.1-15.

Currey, G. (1973): 'The definition of development' in *Showcase State: The Illusion of Indonesia's 'Accelerated' Modernisation*, ed R. Mortimer, Angus and Robertson, Sydney, pp.1-26.

Davidson, A. and M. Ahmad (2003): *Privatization and the Crisis of Agricultural Extension: The Case of Pakistan*, Aldershot: Ashgate.

Davidson, A. and M. Ahmad, (2002):'Effectiveness of Public and Private Sector Agricultural Extension: Implications for Privatisation in Pakistan', *Journal of Agricultural Education and Extension*, 8(3).

Davidson, A.P., Ahmad, M. and Ali, T. (2001): *Dilemmas of Agricultural Extension in Pakistan: food for thought*, Network Paper No. 116, Agricultural Research and Extension, ODI, London, England.

Davidson, A. and B. Grant. (2000): 'Rural Australia: neo-liberalism or a new feudalism?', *Journal of Contemporary Asia*, vol.31, no.3, pp.289-305.

Dean, M. (2001): 'Liberal government and authoritarianism', *Economy and Society*, vol.31, no.1, pp.37-61.

Eldis, (1999): Four Worlds Centre of Development Learning, Facilitation and Training Methodologies: Distance Learning Materials, Sivuliuqtit Management Development Programme.

Ewing, S. (1996): 'Whose Landcare? Observations on the role of "community" in the Australian Landcare programme", *Local Environment*, vol.1, no.3, pp.259-276.

Farrington, J. (1994): *Public Sector Agricultural Extension: Is there Life after Structural Adjustment*, Natural Resource Perspectives no.2, ODI, London, England.

Foucault, M. (1979): 'An introduction' in *The History of Sexuality,* Vol.1, Allen Lane, London, England.

Foucault, M. (1980): *Power / Knowledge: Selected Interviews and Other Writings*, Harvester Wheatsheaf, Brighton, England.

Francis, P. (2001): 'Participatory development at the World Bank: The primacy of process' in *Participation: The New Tyranny?*, eds B. Cooke and U. Kothari, Zed, London, pp.72-87.

Friedman, M. (1980):*Free to Choose*, Harcourt, Brace and Javanovich, New York.

Garforth, C. (1982): 'Reaching the rural poor: A review of extension strategies and methods' in *Progress in Rural Extension and Community Development*, eds G. E. Jones and M. J. Rolls, John Wiley and Sons, New York.

Gow, J. (1994): 'Farm Structural Adjustment an Everyday Imperative', *Rural Society*, vol.4, no.3/4.

Grillo, R. and R. Stirray. (1997): *Discourses of Development: anthropological perspectives*, Oxford: Berg.

Habermas, J. (1984): The Theory of Communicative Action, Vol.1: Reason and the rationalization of society, Heinemann Education, London, England.

Hirst, P. and Zeitland, J. (1991): Flexible Specialization versus Post-Fordism: theory, evidence, and policy implications, *Economy and Society*, vol.10, pp.1-56.

Hyden, G. (1997): 'Civil Society, Social Capital, and Development: Dissection of a Complex Discourse', *Studies in Comparative International Development*, vol.32, no.1, pp.3-30.

Kharrat, A. and Fleifel, F. (2001): *Report on NGOs Operating in Lebanon*, Unpublished report.

Kidd, A., Lamers, J., Ficarelli, P. and Hoffmann, V. (2000): 'Privatising Agricultural Extension: Caveat Empto', *Journal of Rural Studies*, vol.16, pp.95-102.

Lele, U. (1975): *The Design of Rural Development: Lessons from Africa*, Johns Hopkins University Press, Baltimore.

Lewis, W.A. (1955): *The Theory of Economic Growth*, Allen and Unwin, London, England.

Lockie, S. (1997): 'Beyond a "Good Thing": Political Interests and the Meaning of Landcare', *Rural Society*, vol.5, no.2/3.

Marsden, T. and Murdoch, J. (1998): 'Editorial: The Shifting Nature of Rural Governance and Community Participation', *Journal of Rural Studies*, vol.14, no.1.

McDonald, J. (2001): 'Reconfiguring the Countryside: Power, Control, and the (Re)Organization of Farmers in West Mexico', *Human Organization*, vol.60, no.3, pp.247-258.

Mgumia, A. and Ruheza, S. 2001, 'Developing communication material to promote local knowledge and practices on natural crop protection', *SD Dimensions*, Sustainable Development Department, FAO, Italy.

Nair, K. 1979, In Defense of the Irrational Peasant: Indian Agriculture after the Green Revolution, University of Chicago Press, Chicago.

Nelson, N. and Wright, S. (1995): 'Participation and power' in *Power and Participatory Development: Theory and Practice*, eds N. Neslon and S. Wright, Intermediate Technology Publications, London, pp.1-18.

Qamar, M. (2000): *Agricultural Extension at the Turn of the Millennium: Trends*, Food and Agricultural Organization, Rome, Italy.

Petty, J. and Scoones, I. (1995): 'Institutionalizing adaptive planning and local-level concerns: Looking to the future' in *Power and Participatory Development*, eds N. Nelson and S. Wright, Intermediate Technology Publications, London, pp.157-169.

Raiser, M. (1997): 'Destruction, diversity, dialogue: Notes on the ethics of development', *Journal of International Development*, vol.9, no.1, pp.39-57.

Ravenswood, R. (1998): *Privatisation ~ Asset Stripping by Stealth*, [online], available: http://www.hermes.net.au/ravens/privitis.html [2002, July]

Riehl, P. (1996): 'Training teachers: A harvest of theory and practice', *Journal of Extension*, vol.34, no.1.

Rivera, W. (1992): 'Global Trends in Extension Privatization', *Journal of Extension*, [online], Available: http://www.joe.org/joe/1992fall/intl1.html

Rivera, W. M. and Cary, J. W. (1997): 'Privatising agricultural extension' in *Improving Agricultural Extension: A Reference Manual*, eds B. E. Swanson, R. P. Bentz and A. J. Sofranko, Food and Agricultural Organisation, Rome, Italy, pp.203-212.

Rivera, W. and Walker, S. (eds) (1984): *Lifelong Learning Research Conference Proceedings*, Department of Agricultural Extension Education, College Park. Maryland.

Rivera, W.M. and W. Zijp (2002): *Contracting for agricultural extension: international case studies and emerging practices*. CABI Publishing

Rogers, E. M. (1995): *Diffusion of Innovations*, 4th edition, The Free Press, Macmillan Publishing, New York.

Sabel, C. (1989): 'Flexible specialization and the re-emergence of regional economies' in *Reversing Industrial Decline?*, eds P. Hirst and J. Zeitland, St.Martin's, New York, pp.17-70.

Saul, J. (1992): *Voltaire's Bastard*, Free Press, New York.

Sen, A. (1999) *Development as Freedom*, Oxford University Press, Oxford.

Stilltoe, P. (2002): The Development of Indigenous Knowledge: a new applied anthropology, *Current Anthropology* vol. 39. no. 2, pp. 223-253.

Swanson, B. E., Bentz, R. P. and Sofranko, A. J. (eds) (1997): Improving Agricultural Extension: A Reference Manual, Food and Agriculture Organization, Rome, Italy.

Thornburg, D. (1995): 'Welcome to the Communications Age', *Internet Research: Electronic Networking, Applications and Policy*, vol.5, no.1, pp.64-70.

Traxler, F. & Unger B. (1994): 'Governance, Economic Restructuring, and International Competitiveness', *Journal of Economic*, vol.28, no.1, pp.1-23.

United Nations University, (1999): *Participatory Development: Learning from South Asia*, The United Nations University, New York.

Vanclay, F. (1997): 'Hegemonic Landcare: Further Reflections from the National Landcare Conference, *Rural Society*, vol.4, no.3/4.

Wejnert, B. (2002): 'Integrating Models of Diffusion of Innovations', *Annual Review of Sociology*, vol.28, pp.297-326.

Wolf, S. (1998): Privatization of Information and Agricultural Industrialization, CRC Press, Boca Raton, NY.

Wolf, S. and Zilberman, D. (eds) (2001): Knowledge Generation and Technical Change: Institutional Innovation in Agriculture, University of California Press, Berkeley.

4. CYBER EXTENSION: INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) APPLICATIONS FOR EFFECTIVE AGRICULTURAL EXTENSION SERVICES – CHALLENGES, OPPORTUNITIES, ISSUES AND STRATEGIES

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INTRODUCTION

Access to information and improved communication is a crucial requirement for sustainable agricultural development. Modern communication technologies when applied to rural areas can help improve communication, increase participation, disseminate information and help share knowledge and skills. "Cyber Extension" is set to be the major form of Agricultural Extension in the near future. However it has been observed that the majority of rural population in Asian countries still has difficulty in accessing crucial information in order to make timely decisions. It is essential that information availability is demand driven rather than supply driven. The challenge is not only to improve the accessibility of communication technology to the rural population but also to improve its relevance to local development.

ICTs have started to make their presence felt in rural Asia. Farmers and farm-families are browsing the to get general, technical and marketing information from Information kiosks in over 5000 villages across the country in India. If the rural areas can be connected and the "masses" are empowered with "information", the rural economy will take a leap forward into the digital millennium with a great speed. The process has already started. The focus on "e-Governance" and "IT for masses" is also emerging as front-runner in the vision documents of many Asian countries. Technologies specially suitable for rural areas are being developed and deployed. Portals on rural markets and agricultural services are being hosted. District level web sites are being hosted, information kiosks are being established at sub-district and village levels and the technical and other need-based information is being collected, digitized and hosted on the Internet. The "Pakkisan.com" and "Villages Online" portals of Pakistan, The "Grameen Bank's Village Communication Programme" in Bangladesh, Radio-Browsing Programme in Bhutan, "Penang E-learning Community" in Malaysia and "Interactive Radio" and the " Kothamale Community Radio" in Srilanka are all trend-setter projects in South Asia .The pilot projects of " Warna Wired Villages" in Kolhapur, Sangli districts of Maharastra, "Gyandoot" intranet project in Dhar District in M.P. (Details at Annexure I) and "Info villages" in Pondicherry, Infothela Mobile Telecentre of IIT Kanpur, community radio in Andhra Pradesh, Drishti.com in Haryana, U.P. and Bihar and many other such rural initiatives in India have successfully demonstrated the acceptability and usage of high-end information and communication connectivity at the village level.

ASIA AND AGRICULTURE

Agriculture continues to be the main occupation and way of life for more than half of Asian population even today. 63% of Asia's total population derives its livelihood from agriculture (Table 1). According to Food and Agricultural Organization (FAO) Asia has 73% of the world's farming households and 80% of world's small farmers (Riggs Micheal, 2003). 79 % agricultural labor of the world resides in Asia. Most of the Asian countries have majority of their population living in rural areas, some of them have 80% or above as rural population (e.g. Nepal, Bangladesh), whose prime source of livelihood remains agriculture. Sustainable prosperity of this class - the farmers, the land-less agricultural laborers holds the key for improving the overall development scenario in the Asian region. Asian Agriculture had been on traditional lines till the first waves of Green Revolution in late 60s particularly in India, Pakistan and Nepal. The Green Revolution gave a sudden boost to the production and productivity of major cereals in the assured irrigated areas.

The production and productivity of Agriculture have shown very good trends over the last 50 years. In India, the compounded annual rate of growth in agriculture has been over 2.5% per annum since 1951, as compared to less than 0.5% per annum in the preceding 40 years (CMIE, 1997). This growth has, however, not been equal over time (the years and decades) or space (the length and breadth of the country, irrigated and dryland geography) , or across crops. The growth has been very good in the decades of 60s and 70s, not so good in 50s and 80s. It has been excellent in some areas – primarily assured irrigated geography, but not very good in rainfed areas. Similarly, some crops like wheat and paddy have recorded excellent growth rates, but similar trends are missing in case of pulses and oilseeds. The trends in other Asian countries are also quite close to the Indian experiences. The net impact of these trends on the livelihoods of rural areas is that the benefits of research and development in agriculture have been limited to irrigated areas, large and medium farmers and to major cereal crops. Now, the challenge for the extension systems in these countries is to reach the multitude of small and marginal farmers and also to reach more diversified geography of rainfed areas. There has been a good progress in terms of creating agricultural research and education infrastructure in almost all Asian countries. The councils of agriculture research have contributed very significantly in terms of developing new varieties of crops, thereby improving the productivity and protection of major crops. This, however, has been primarily in the public sector and hence private participation in agriculture research and education has been very limited. In the input post-harvest and processing sectors, the private sector has played a very important role in the last few decades.

Table 1*. Population Dependent on Agriculture in Asia

	Total Population (Million)	Rural Population (Million, %)	Agricultural Population (Million, %)	Agricultural Labor (Million, %)
World	6057	3210 (53%)	2567 (42%)	1319 (22%)
Asia	3072	2325 (76%)	1943 (63%)	1040 (34%)
Asia in the world	(50.71%)	(72.00%)	(75.69%)	(78.84%)
India	1009	722 (72%)	541 (54%)	264 (26%)
Pakistan	141	89 (63%)	72 (51%)	25 (17.73%)
Bangladesh	129	102 (79%)	72 (56%)	38 (29.45%)
Nepal	23	20 (87%)	21 (91%)	10 (43.48%)
Sri Lanka	19	14 (74%)	9 (47%)	4 (21%)
China	1282	866 (68%)	85.4 (67%)	511 (40%)
Japan	127	27 (21%)	5 (39.3%)	3 (23.6%)

Table 2*. Geographical Area and Agricultural Land in Asia

	Total Population (Million)	Total Geographical Area(M. Hectares)	Area under Agriculture (Million Hectares)
World	6057	13098	1380
Asia	3072	3085	497
Asia (%)	(50.71%)	(23.55%)	(36.0%)
India	1009	297 (2.27%)	161 (11.66%)
Pakistan	141	77 (0.59%)	21.43 (1.55%)
Bangladesh	129	13	8
Nepal	23	14.3	2.9
Sri Lanka	19	6.46	0.87
China	1282	933 (7.15%)	124 (8.98%)
Japan	127	38	4.54

* Source for base data: Human Development Report 2003. Web Edition

CONNECTIVITY IN ASIA

We are living in the information age. The revolution in Information and Communication Technology (ICT) has impacted all walks of life. Telephones, mobile phones, computers and most importantly, the Internet has changed the whole concept of communication. Internet today is not just

another means of communication. Those who use Internet regularly know that Internet is POWER. It not only gives a user all kinds of information, but also enables him to do things one could not even dream of till recently. The power of the Internet may be gauged by the following examples: In most companies in India and Japan, Information Technology (IT) has been used for data processing for over a decade. It has brought in significant efficiency. Yet the IT department rarely amounted to more than 1 to 2 percent of total expenditure of an organization.

However, with the advent of internet, the IT departments have extended themselves from data processing to sales and marketing; and sales and marketing amounts to 30 to 35% of the expenditure of a commercial organization. Fifty percent of the cost of goods in stores is due to several layers of distribution costs. Internet is likely to make a major impact on this, bringing the manufacturers and the consumers in direct contact, through e – commerce. Internet gives its users a competitive advantage, and those without access, are facing significant disadvantages. In other words, access to the Internet can enable people in many of ways, including providing access to education, removing barriers of distance and remoteness, and enabling one to get all kinds of information and to close business deals. But at the same time, lack of internet access would put a person or organization or even the "Sector" (Agriculture for example) at a tremendous disadvantage. Therefore, unless steps are taken to provide Telecom and Internet access widely in rural areas, one would face accentuation of differences between countries who have provided widespread access and those who have not differences between Haves and Have-nots within a country, where only a few have internet access will be accentuated.

The most critical element for communications is connectivity. On this front, a lot needs to be done in Asia. Access to telephones and Internet is very poor in major Asian countries. Barring Japan, Singapore and China, telephone access in Asian region is less than 10% (Table 3). The connectivity in rural areas is poorer. In Asian countries like Bangladesh and Nepal there is on an average 1 to 1.5 telephone connections for 100 persons, whereas in the developed countries like Sweden, Denmark and Japan, the average number of telephones for 100 persons is 153, 146 and 117 respectively (Human Development Report, 2003). Internet connectivity also shows similar trends. Hence, the telecom infrastructure is very important, and requires priority in providing information and connectivity to rural areas.

The new ICTs (Information and Communication Technologies) are changing the way the world works, including the way agriculture and natural management are practiced (Odumbe Helen Hembly et al, ISNAR 2002). ICT changes the management of knowledge. It has become instrumental for networking and rapid problem solving, and it conveys new information for decision-making and entrepreneurial activity (Mansell and When 1998). ICTs can enable rural communities to address the concomitants of poverty; lack of access to education and health services, lack of productive opportunities, and isolation and lack of information. The term ICT here captures a multitude of equipment and services. These range from the satellite communication system, telephone system, the Internet, the electronic databases to e-commerce services via the World Wide Web.

Table 3. Access to Telephones and Internet in Asia

	Total Population (Million)	Population Living below US$2 per Day	Telephone Density (per Hundred)	Internet Density (per Hundred)	Personal Computer Density (per Hundred)
World	6057	--	--	---	---
India	1009	80%	4.4%	0.7%	0.6%
Pakistan	141	66%	3.7%	0.34%	0.4%
Bangladesh	129	83%	0.8%	0.1%	0.2%
Nepal	23	82%	1.4%	0.3%	0.4%
Sri Lanka	19	45%	8.0%	0.8%	0.9%
China	1282	47%	24.8%	2.6%	1.9%
Japan	127	--	117.4%	38.4%	35.8%

Source for base data: Human Development Report 2003.Web Edition

CHALLENGES FOR AGRICULTURAL EXTENSION

Quick dissemination of technological information from the agricultural research system to the farmers in the field, and reporting of farmers' feedback to the research system is one of the critical inputs in transfer of agricultural technology. The information and communication support during last half century has mainly been conventional. It has primarily been public sector service to the farming community. The extension personnel of the Department of Agriculture disseminated technological messages to the farmers

manually. This approach has not been able to reach a majority of farmers, spread across the whole country. This gap remains a challenge for the extension systems even today. It is more so in developing countries, where the number of farmers is very large and the geography is more varied. In Asia, it is a big challenge today. To reach over 400 million farmers, spread over a vast and varied geography is an up hill task. The diversity of agro-ecological situations, adds to this challenge further. The success of the Green Revolution was mainly achieved due to the concerted and homogeneous extension approach for the assured irrigated area. Now as we move to address the needs of rainfed eco-systems, the extension strategy becomes more complex. Farmers' needs are much more diversified and the knowledge required to address them is beyond the capacity of the grass root level extension functionaries.

CONCEPT OF CYBER EXTENSION

Today, it is possible to find a solution to this situation by using the potential of Information and Communication technologies to meet the location specific information needs of the farmers. The information and communication networks are expanding very fast. The number of internet connections in India has crossed the two million mark and the number of telephone connections is over 35 million. Internet connectivity has touched almost all the districts in the country, and is moving down to the sub-district and village levels. Pilot projects to connect rural community to the cyber-space are underway at various locations. The initial response of the rural people, particularly women, has been very encouraging.

Cyber:

According to Oxford Dictionary the word Cyber means, "relating to Information Technology, the Internet, and virtual reality, the *Cyber Space*".

The Cyber Space:

Cyber Space is the imaginary or virtual space of computers connected with each other on networks, across the globe. These computers can access information in the form of text, graphics, audio, video and animation files. Software tools on networks provide facilities to interactively access the information from connected servers. The cyber space thus, can be defined as the imaginary space behind the interconnected telecommunications and computer networks, and the virtual world.

Extension:

Extension stands for "the action or process of enlarging or extending something". It could be extension of area, time or space.

Agricultural Extension:

Agricultural Extension, according to Dr. D. Benor, " relates to the process of carrying the technology of scientific agriculture to the farmer in order to enable him to utilize the knowledge and better the economy. Agriculture extension service seeks to impart the necessary skills to the farmers for undertaking improved agricultural operations, to make available to them timely information 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" (Benor et. al 1984). Extension is an on-going process of getting useful information to people (the communication dimension) and then in assisting those people to acquire the necessary knowledge, skills and attitudes to utilize this information, or technology (the educational dimension) effectively. Thus, Extension is a central mechanism in the agricultural development process, both in terms of technology transfer and human resources development (Samanta, 1993).

Cyber Extension:

Cyber Extension can be defined as the "Extension over Cyber Space". As the word extension is subject-neutral, so is cyber extension. But in the applied context of agriculture, cyber extension means "*using the power of online networks, computer communications and digital interactive multimedia to facilitate dissemination of agricultural technology*". Cyber Extension includes effective use of Information and Communication Technology, national and international information networks, internet, expert systems, multimedia learning systems and computer based training systems to improve information access to the farmers, extension workers, research scientists and extension managers.

Cyber Extension: ICT Enabled Approach for Research Extension Communication:

The cyber extension is not a replacement for the existing systems of communication. ICTs will augment, the reach and two-way interaction among the key stakeholders in a big way. The new technology offers new opportunities. It will add more interactivity. It will add speed. It will add two-way communication. It will add to wider age and also more in-depth messaging. It will widen the scope of extension; it will also improve quality. It will subtract costs and reduce time. It will reduce dependency on

so many factors in the chain of extension system, and it will change the whole method of extension in the coming decade. “The continuing rapid development of telecommunications and computer-based information technology (IT) is probably the biggest factor for change in extension, one, which will facilitate and reinforce other changes. There are many possibilities for the potential applications of the technology in agricultural extension (FAO, 1993; Zipp, 1994). IT will bring new information services to rural areas, and farmers, as users, will have a much greater control over IT than over current information channels. Even if every farmer does not have a computer terminal, these could become readily available at local information resource centers, with computers carrying expert systems to help farmers to make decisions. However, it will not make the extension worker redundant. Rather, they will be able to concentrate on tasks and services where human interaction is essential – in helping farmers individually and in small groups to diagnose problems, to interpret data, and to apply their meaning (Leeuwis, 1993). The researchers at the university should now involve the Krishi Vigyan Kendras, extension functionaries and even the farmers right from the beginning of the project. They can share their objectives, their methodology of research, methodology of analysis and also the observations and intermediate results with the concerned fellow scientists and the interested farmers. In this open system, the other stakeholders can give their feedback and their suggestions to the researchers at every stage of experiment. In some cases, even the farmers can participate in adoptive research. The validation of research can definitely be done at an appropriate number of locations within the concerned agro-eco-zone, with the results of the same being shared among all stakeholders online, at various stages of research.

The packaging of research recommendations has to be done in a more participative way with the help of Information & Communication technology. The extension functionaries at district level could be taken into confidence before final packaging of the "practices" or “technologies” for each crop. The experiences and results of various trials could also be indicated in the proposed package of practices. The extension functionaries may then keep the concerned researchers informed on the field feedback electronically. This way, the ICTs will help both- the researchers and the farming community to talk to each other on a regular basis.

AGRICULTURAL EXTENSION SYSTEM IN INDIA

The Ministry of Agriculture (MoA) is responsible for program planning and implementation for Agriculture at the national level. The Department of Agriculture and Cooperation (DAC), headed by the Secretary to the Govt. of India, is responsible for development programs and policy, and the Dept. of Agricultural Research and Education (DARE), headed by the Director General, Indian Council of Agricultural Research (ICAR) is responsible for agricultural education and research. The National Institute of Agricultural Extension Management (MANAGE) is the apex National institution of Extension Division, Department of Agriculture and Cooperation, Ministry of Agriculture to provide policy and capacity building support to the Indian extension system.

Public sector extension is a state responsibility that has undergone several transformations since independence. Initially, the focus of extension was on human and community development. However, there has been a steady progression toward technology transfer, within the policy framework of food security. The most significant recent development was the introduction of the Training and Visit (T&V) extension management system, starting in the mid-seventies, under the World Bank funded National Agriculture Extension Project (NAEP). T&V extension was well suited to the rapid dissemination of broad-based crop management practices for the high yielding wheat and rice varieties released since the mid-sixties. Given this focus on disseminating Green Revolution technology for major cereal crops, extension activities have been largely carried out by state Departments of Agriculture (DOA). Other line departments like Animal Husbandry (DAH), Horticulture (DOH) and Fisheries (DOF), have primarily focused on the provision of subsidized inputs and services to farmers, with little attention and few resources being allocated to extension.

By the early 1990’s, with the completion of the third National Agricultural Extension Project (NAEP), the important contributions that the T&V extension approach had made to agricultural development were duly recognized. But it was also realized that it needed to be overhauled in meeting the needs of farmers in the 21st century. It was recognized that extension should begin to broad base its programs by utilizing a farming systems approach. For example, attention should be paid to the needs of farmers in rain fed areas and to diversify extension programs into livestock, horticulture and other high value commodities that are capable of increasing farm income. A realization has also dawned that issues like financial sustainability, lack of farmer participation in program planning and weak links with research are serious constraints facing the current extension system.

During the same period, the National Agricultural Research System, under the institutional leadership of the ICAR, has been strengthened through parallel National Agricultural Research Projects (NARP), running concurrently with NAEP. National Agriculture Technology Project is the latest program, which has both Research and Extension as its components. The extension component is termed as "Innovations in Technology Dissemination (ITD) Component" with around 18% of the NATP project funds committed to the ITD component. The purpose of this NATP project was to consolidate the earlier investments and address specific system constraints, weaknesses and gaps that remained un-addressed by the previous research and extension (R-E) projects. This component, in particular, was expected to test new innovations in technology dissemination that would begin to delineate the future direction of the extension system and at the same time, bridge serious research-extension farmer (R-E-F) 1inkage problems that currently constrain the flow of appropriate technology to farmers.

Innovations in Technology Dissemination component of NATP envisaged the establishment of Agricultural Technology Management Agency (ATMA) in 28 pilot districts (4 in each of the seven participating States). The ATMA at district level is becoming increasingly responsible for all the technology dissemination activities at the district level. It has linkage with all the line departments, research organizations, non-governmental organizations and agencies associated with agricultural development in the district. Research and extension units within the project districts such as ZRS or substations, KVKs and the key line Departments of Agriculture, animal husbandry, horticulture and fisheries etc. would become constituent members of ATMA.

1. Improving Communication Capacity of Agricultural Extension System

The weak linkages among extension, research, marketing network and farmers limits the effectiveness of research and extension in contributions to agricultural development. The Government of India has identified this problem, and is addressing it through several national programs. The erstwhile emphasis on usage of vernacular press, radio and television for reaching to the farmers is being augmented with use of state-of-the-art communication technologies such as internet and satellite communication. Under the new initiative of NATP, adequate attention is being paid to provide ICT connectivity down to the block level. This connectivity will facilitate two-way communication among all the stakeholders in the research-extension-marketing-farmers loop. Apart from core Information and Communication Technology (ICT) connectivity, other forms of audio and visual communication like satellite communication (SATCOM) are also being promoted on a project basis.

2. Research-Extension Communication in India: the Present Scenario

The major medium of communication among the research and extension agencies in India is still "face-to-face communication". The DAC (Department of Agriculture and Co-operation)-ICAR (Indian Council of Agricultural Research) interface at the highest level provides the interaction platform for the policy makers in Department of Agriculture and Cooperation and the Senior Scientists of ICAR. Thus, the information and communication support during the last 50 years has mainly been conventional. The extension personnel of the Department of Agriculture disseminated the technological messages to farmers manually. This approach has not been able to reach majority of the farmers who are spread across the whole country. This gap remains a challenge for the extension system even today.

State Level: At the state level a similar mechanism exists in almost all the states, where the State Departments of Agriculture interact with the concerned State Agriculture Universities, Research and extension scientists prepare plans for extension activities at field level. In some of the states, the SAUs have established extension centers at each district (Andhra Pradesh - DAATTC (District Agriculture Advisory and Transfer of Technology Centre of ANGRAU- please see Annexure IV for details). There are few other mechanisms in between these systems. These include the interactions among research scientists and extension managers at Zonal Research Station Level and at Krishi Vigyan Kendra (KVK) Level. Thus, the research extension communication is mainly interpersonal, which is generally followed by technical literature from the university side and field feedback (in written form) from extension side. This mechanism prevails in most of the states in India. Under NATP and UPDASP (Uttar Pradesh Diversified Agricultural Support Project), Internet based connectivity has been provided to the major stakeholders in research and extension systems in 46 pilot districts.

The basic communication flow consists of periodical reports to the project agencies and in some cases, email communication between researchers and extension managers. The Project districts that have hosted their websites provide basic information about district, the agricultural pattern of the district, the strategic research and extension plan (SREP) and major initiatives under the concerned projects. The universities have also hosted their websites and in some cases, the ZRSs and KVKs have also done so. These websites primarily serve as a ready reference for contacting the concerned agencies. They provide

contact address, email address and telephone number of important scientists. The technical material on the university websites is of very general nature. The material is however very useful for the university scientists placed at ZRS and KVK levels, and extension personnel at the district level. This can be considered as the phase-1 of using information communication technology for agricultural extension. The second phase of this initiative will include e-enabling the research extension communication process in a dynamic sense. This will involve re-engineering of existing communication mechanism at various levels.

3. Reaching the Last Mile: Connecting the Farmers

The concept of "Village Information Shops" is being discussed, debated and experimented in India at various places. Experiments of Dr. M.S. Swaminathan Research Foundation (MSSRF), Chennai (Annexure II), 'Information-Villages' of MANAGE in Ranga Reddy District in A.P., Gyandoot.net initiative of District Administration, Dhar, M.P., EID-Parry's Wireless in Local Loop based Village Kiosks in Cuddalore District of Tamilnadu and 'Warna Wired Villages' of National Informatics Centre (NIC) in Kolhapur-Sangli Districts of Maharashtra (details enclosed at Annexure III) are some of the cases which provide good insight into the information needs of farmers and farm-families and their paying capacity. Preliminary results indicate that, 'Agricultural Extension' alone is not sufficient to sustain the 'Information Shop' at the village or even at the block level. The information supply domain has to be much larger and dynamic so as to offer value-added information like market prices, local topical information like bus and railway timetables, weather forecasts etc. The experiences of Gyandoot (Dhar) indicate that the 'Village Information Kiosk' can be a self-sustainable enterprise (with a potential to provide job for two young rural people at each kiosk), if 'e-governance' services are integrated with the information network. The rural people are willing to pay for the information services, provided the services are a little more exhaustive and improve their livelihoods. The 'Extension' information is a very important component of the information needed at the village level. The quality and content have to be changed quite drastically to make the extension information none farmer friendly.

The packaging of extension information for the 'Information Kiosk' has to be more visual, more complete (it must provide full knowledge and information about the topic and various scenarios and options to the farmers) and should also indicate the source of information and further reference for crosschecking and clarifications. This will bring in more direct communication between the farmers and researchers and will also improve the quality and language of research-extension packaging and feedback. The lessons from Pondicherry indicate that farmers seek the information on seeds and fertilizers and also on pests and diseases in groups and then they discuss the information at the 'Information Kiosks'. This implies that the information dissemination in the connected villages is likely to happen through the farmers' organizations, farmer interest groups and other informal groups. Another such experiment that has been running over 3 years now is the "Warna Wired Villages - connected by National Informatics Centre. The backbone for the group access in this experiment was the co-operative society, which has been a very successful phenomenon in Maharashtra since late 60s. In Tamilnadu Nellikuppam Project of n-Logue and EID Parry, the basic framework of farmers groups is provided by a sugar factory catchment area. Another technology that is gaining the confidence of farmers' is Satellite enabled Mobile Video Conferencing.

'MANAGE' EXPERIENCES IN CYBER EXTENSION

National Institute of Agricultural Extension Management (MANAGE), Hyderabad, is an apex National level institution of Ministry of Agriculture, Government of India. MANAGE has the mandate to continuously work on understanding, analyzing, documenting, planning, implementing and monitoring the processes involved in Agricultural Extension Management systems in India. MANAGE has been involved in conceptualizing and pilot testing the "Innovations in Technology Dissemination", a World Bank supported Project, in 7 states and 28 districts across the country. The appropriate usage of information communication technology to improve the efficacy and efficiency of the extension systems has been one of the important agenda items of MANAGE since its very inception. We had developed 95 hours equivalent of classroom lessons on "Watershed Management for Rain fed Areas " on a multi media CD, as early as 1993 and the CDs were shared with all the district Collectors and Project Directors of DRDAs during 1993-97. Considering the availability of increasing telephone connectivity at the Sub-District and village level, and to test the possibility of huge advantages of rural ICT connectivity, MANAGE has taken up a number of innovative projects to provide information and communication connectivity to the farmers and farm families in rural areas, under the banner of "Cyber Extension". These projects include- i) Connecting over 25 Districts, 400 Blocks on internet; ii) Implementing Wireless in Local Loop Technology in Agriculture to provide Telephone and Internet connectivity to rural population; iii) Connecting over 40 national level institutions in two-way Video Conferencing: and iv) Providing video conferencing access to farmers'

groups and farm-families in rural areas through its mobile V-SAT Van. The details of these projects are detailed here:

1. ICT Connectivity at District and Block Level under NATP

MANAGE is involved in implementing National Agriculture Technology Project (NATP) in 7 states and 28 participating pilot districts. Decentralizing decision-making, bottom up planning, multi agency extension delivery and appropriate use of media and ICTs were the major objectives of the project. Roughly 25% of the project funding (to the tune of Rs.30 crores) was earmarked to provide ICT connectivity and content development at 42 project implementing agencies, which include 28 districts (Agriculture Technology Management Agency), Krishi Vignana Kendras, concerned State Agricultural Universities, concerned State Agricultural Management and Extension Training Institutes (SAMETIs) and the State Headquarters. The ICT connectivity (computer, printer, modem, UPS, internet connectivity) has been provided at all the PIAs and also at all the blocks (over 400) in the 28 participating districts, Farmers Information Advisory Center (FIACs) have been established at each of the blocks and information services on agriculture, animal husbandry, horticulture, sericulture and other development departments along with marketing information is being made available at these FIACs. In some states like Maharashtra, Punjab and Bihar, the ATMAs have tie ups with private service providers for information package and delivery. Information Kiosks have been opened by the private sector for technical information delivery in the districts of Ahmednagar, Aurangabad, Amaravathi, Faridkot and Madhubani. The ICT connectivity provided at block level has thus catalysed the public private participation in the extension information delivery at the grass root level.

A number of Agricultural Universities, government departments and also some private entrepreneurs have hosted agricultural web sites. The agricultural information base on the net, is building up slowly but surely. MANAGE has taken the initiative to provide linkages to the technical and other farmer friendly information thru its Web Site. MANAGE is also supporting a number of Agricultural Universities and other research and training organizations, both in public, and voluntary sector, in building their capacity to digitize the agricultural information and their technical information and host the same on the Web. The web-sites of 4 Regional Extension Education Institutes (EEIs), 6 State level Management and Extension Training Institutes (SAMETIs), 24 Districts, and many others organizations have been designed, developed and hosted by MANAGE. The web-sites of 24 Districts (Agricultural Technology Management Agency, ATMAs), contain very important information on district profile, land use pattern, District Agriculture scenario, Strategic Research and Extension Plans (SREPs), replicable success stories, and information on important contact persons with their telephone numbers and e-mail-ids. These web sites have improved the information dissemination of these institutions significantly.

2. Use of Wireless in Local Loop (WiLL) Technology to Provide Rural Connectivity

MANAGE has implemented the WiLL Technology (CorDECT based WiLL Technology developed by IIT, Chennai) at Achalpur Taluk in Amaravathi District of Maharashtra state, under NATP. A hub with an antenna of 30 meters height has been established at Taluk (block or a sub-district) Headquarters, which provides internet and telephone connectivity to a radius of 10 to 25 Kms. Recently, at Achalpur, a major awareness campaign was organized jointly by MANAGE, ATMA, Amaravathi and M/s N-logue, Chennai with full cooperation of District Collector, Amaravathi to sensitize the rural community in and around Achalpur Taluk to use this technology optimally. Around 15 information kiosks have already become operational by the end of November 2003 and the number is expected to reach 30 by December 2003. A development team jointly constituted by MANAGE and M/s N-logue at Achalpur, is packaging information on Agricultural Services along with other rural development programs. The full content is being packaged in Marathi and all the development personnel have been hired from the local area, to use the appropriate language for communication. This is the first Wire Less in Local Loop (WiLL) project exclusively in the agriculture sector implemented in India.

3. Establishing Video Connectivity at Centres of Excellence in Agriculture and Rural Development

MANAGE had established a video conferencing studio in August 2000 and used it very effectively and economically to get high quality technical input on agriculture research, education, training and management from national and international organizations. We had technical input from Food and Agriculture Organization of the United Nations (FAO), Rome in a National Workshop on Cyber Extension in January 2002. Realizing the limitation of institutional connectivity in India, MANAGE provided Video Conference connectivity to 35 centers of excellence involved in agriculture research, management, marketing and training. These centers included NIAM, Jaipur, and State Agriculture Universities at Jammu & Kashmir, Punjab, Haryana, Rajasthan, Gujarat, Maharashtra, Assam, Uttar Pradesh, Bihar, Jharkhand,

West Bengal, Orissa, Tamil Nadu, Karnataka, Kerala, Andhra Pradesh and Uttaranchal. This provides us with a strong technical communication backbone among the most important institutions involved in agriculture, research, education and training. The video connectivity among these institutions has triggered a huge increase in inter university communication among the university administrators and scientists. MANAGE has used this backbone to access the best of the resource persons available in these institutions to enrich its training and consultancy programs. We have also provided video conferencing consultancy to The National Institute of Rural Development (NIRD). We have connected 6 of their sister institutions namely NIRD-Guwahati, SIRDs at Jaipur, Bhuwaneswar, Mysore and Kottarkara (Kerala) along with NIRD headquarters' at Hyderabad. The video conferencing connectivity among these institutions has been found to be an effective communication tool for scientific interactions and also for policy discussions. The video conferencing facilities at these institutions have been appreciated and used by the Hon'ble Chief Ministers of Assam, Jharkhand, Madhya Pradesh and so also by the Hon'ble President of India Mr. A.P.J. Abdul Kalam in the recent past. Thus the video conferencing corridor in over 35 institutions of national importance in agricultural and rural development is providing face to face communication to over 50% of technical experts in these areas. We are continuously getting requests from other institutions in agriculture and rural sector to provide this connectivity at their locations. MANAGE is consciously and continuously working on identifying and using most effective and most suitable (economically as well as technically) technological options to provide connectivity to various stake holders in the Agricultural Extension system.

4. Mobile VSAT Van based Video Conferencing

The VSAT based satellite communication on video was available in India since the last 10 years. The ISDN networking is now making it available up to state Headquarters and at the most up to the district level (not yet covered fully). The rural areas and the farming families continue to remain outside the on-line communications for all practical purposes. To explore the possibility to reach the last mile, MANAGE has acquired Mobile VSAT Van based video conferencing which can be established at any place in the country (wherever a four wheeler can go). A Toyota Qualis van has been fitted with a 1.8 meter diameter satellite antenna and with full complement of video conferencing connectivity including a high quality TV, VC camera, a laptop computer, Uninterrupted Power Supply (UPS) and a generator. The Mobile VSAT (Very Small Aperture Terminal) Van goes to the villages and the videoconference connectivity is established with in 1 hour using Global Positioning System (GPS) technology and VSAT connectivity. MANAGE has send this van to over 100 rural locations in the last 3 months (predominantly in Andhra Pradesh). The farmers and farm families from remote locations have had interactions with scientists from Agricultural University, researchers from ICAR system, trainers from MANAGE & NIRD and policy makers from Government of Andhra Pradesh. The video conferencing sessions have been attended by ordinary farmers, landless laborers, DWCRA group members, project staff of DRDAs, project staff of Andhra Pradesh Rural Livelihood Project (APRLP), District Collectors of concerned districts, Commissioners of Agriculture and rural empowerment and has also been attended by the Hon'ble Chief Minister of Andhra Pradesh on more than one occasion. All the interactions have been in local languages i.e. Telugu and hence there has been virtually no barrier in communications. Each of the session was attended by around 200 farmers (on average) from the rural side and by 3 to 4 experts from MANGE side. The impact of this connectivity has surpassed our expectations. We have been able to reach and communicate with over 20000 farmers in just 3 months and extremely valuable technical discussions have been taken place in this short time. We have now started the process of working out the economics of this project and would like to share our findings with the academic and policy-making community at the earliest.

5. Establishing Information Kiosks at 11 Villages in Ranga Reddy District of A.P.

To test the information needs, information supply and the efficacy of setting up "Village Information Kiosks", we have taken up a project on "Reaching The Last Mile: Information Technology For Farmers And Farm Families At Their Door Step" in Rangareddy District of Andhra Pradesh, as it is the home district of MANAGE. Computers were installed in 11 villages in Rangareddy district in the last week of September 2000. One System with one printer, one modem and a 1 KVA UPS was provided to each village. The systems were placed in the premises of Mutually Aided Thrift and Credit Society (MACTCS) in nine locations and at Gram Panchayat Office at two locations. The expenditure for this *Project* was borne by MANAGE. The connectivity at these 11 villages was set up at a total cost of Rs. 11 lakhs (Rupees 1.1 Million). In the RR district project, the eleven village-booths cater not only to the eleven villages but each of these villages caters to the surrounding 25-30 villages, from where these MACTCS have group members. *The Village Information-Kiosks* have been established in the buildings of MACTCS, which are located in the vicinity of mandal headquarters (a sub-district administrative structure in A.P., A district has on an average 45-50 mandals, and each mandal has around 25-30 villages). These places are

well connected with major roads, which are important points for catching the bus etc. Thus, the total outreach of the RR District project is around 250-300 villages.

1) Village Information-Kiosks

Village Information-Kiosks are 11 village sites working as rural cybercafe-cum-cyber-offices. Each *Village Information-Kiosk* provides services to about 25-30 villages, i.e. around 20000 to 30,000 population. The *Village Information-Kiosks* are located on the roadside and are central villages where people normally travel. *Village Information-Kiosks* have telephone line connectivity to begin with. The hardware is procured and given to the Women Groups or farmers' groups under agreement with the president of the respective MACTCS. The MACTCS have an accountant (basically to maintain MACTCS finances), and a Manager and 10-12 organizers at the Mandal Head quarters, who manage the *Village Information-Kiosks*. Two of the MACTCS have constructed their own buildings and have provided adequate space for "computer room". They have also provided the telephone and electric connection as well as the furniture. These functionaries have been provided "Basic IT Training" by MANAGE IT facilitator at the *Village Information-Kiosks* sites. MANAGE has provided the service of one IT facilitator at each of the 11 *Village Information-Kiosks* for a period of 6 months to ensure proper training to all the farmers and farm families (the women, boys and girls), and also to assess the information needs at the village level.

The IT facilitators at these *Village Information-Kiosks* have already trained over 20 persons at each site on " MS Office", internet and e-mail, browsing and search engines. At some of the villages, the younger generation has already learnt Ms-FrontPage and other web-designing software tools. These high-school level students have shown very keen interest in learning new technology. The language has not been a barrier at all. We have also taken care to provide the IT facilitator from the local area, so that he/she can interact with them in the local language.

2) Village Information Kiosk Services

In all the *Village Information-Kiosks* sites, the maintenance and operation of MACTCS finances is one of the major services. Earlier, two accountants (appointed and paid by the MACTCS groups) were maintaining the accounts, but now only one of them is able to share the whole responsibility. The other person is now free to collect information needed by village members to host on the website of the *Village Information-Kiosks*. The accounting system software was developed and provided by MANAGE. Most of the farmers in these villages are involved in vegetable cultivation and they supply their produce to the city market (as Ranga Reddy District is a periphery to Hyderabad - Secunderabad twin cities). The Government of Andhra Pradesh has opened 8 Rythu Bazars (Farmers' Market), where the farmers (or their family members) can bring their produce and sell the same to the consumers directly. MANAGE has arranged to host the Rythu Bazar prices on its website and all the farmers can have access to these prices very early in the morning everyday. Besides the Rythu Bazar prices, the general market prices of agricultural produce across the whole country is also accessible to these Village *Information-Kiosks*, through agriwatch.com. Agriwatch.com has given free access to their website to these 11 villages (although the access to the pricing information on their website is otherwise charged).

The farmers are also accessing the websites of MANAGE to know about the training programs of MANAGE and other agricultural training institutions in and around Hyderabad. They access Rangareddydistrict.com to know about the development schemes of the district. The District Rural Development Agency (DRDA) has put up all its schemes and their operational guidelines on their website. The RR District website covers subjects such as:

- District Rural Development Agency (DRDA)
- Watershed Programs
- Program for Scheduled Casts
- Cooperatives
- Backward Classes Welfare Schemes
- Department of Agriculture Schemes
- Yuva Shakti (Youth Programs)
- Housing
- Programs for Handicapped persons
- Bal Karmik (Program to eradicate child labor)
- Panchayati Raj (Program on local self government)
- Apathbandu (Program for sudden death victims)
- Games & Sports
- Programs for Minorities
- Programs for Animal Husbandry

- Programs for Scheduled Tribes
- Nehru Yuvak Kendras (Nehru Youth Centres)

Farmers have evinced a keen interest in their programs, for their utility and participation of the village community. Recently, when the Home Minister of the State inaugurated the second MACTCS building at Keesara Mandal, the women of the village asked a number of questions on implementation of various welfare schemes, particularly those for ladies. They also expressed their unhappiness about paucity of drinking water in their area. They also suggested schemes under which development works could be undertaken. Thus the information access at the village level has improved the information about the state programs meant to support the village community and they are able to articulate their needs and demands much more clearly to the concerned officers.

The information access at the village level is putting pressure on the middle and senior level state officers for delivering the programs and schemes in time and to the needy. They are also under constant pressure as the transparency throughout the system has improved. The villagers know their eligibility for housing loans, crop loans and other schemes and they are able to inform the concerned officers about their demands with full supporting documents, and in time, due to information availability through the websites. Besides normal websites, the rural community in these villages is using multimedia CD learning packages for making pickles, learning about maternity and child health, importance of child education, issues regarding child labor, nutritional aspects and also expert systems on crops. A number of families have taken up pickle preparation and are taking their produce to the Rythu Bazars regularly. The CD on pickle preparation (which is in local language) is a big hit in all the 11 villages. The telugu websites are very popular at all these kiosks. The newspaper websites of Vaartha.com, eenadu.net and even Deccan.com (an English daily), are being accessed very regularly. Evaram.com, an international telugu website is very informative and gives information on virtually every issue right from the subjects like child health and nutrition to DVDs, films, matrimonials and medical services. These websites are creating tremendous awareness among the rural masses and are also creating more hunger for education for the younger generation.

6. Kisan Call Centre

The latest entry in the Cyber Extension initiatives basket of MANAGE is the toll free call center for the farmers of state of the Andhra Pradesh. MANAGE is in an advance stage to start a call center to answer the queries of farmers from any part of Andhra Pradesh on technological, pricing, marketing and input availability issues. This project is being undertaken under the aegis of the Ministry of Agriculture, Govt. of India. 15 such call centers are being proposed in various important institutions in the country.

7. MANAGE Recommendations to Government of India on Cyber Extension

The process of Cyber Extension in India needs to have a clear vision at the national level, state level and more importantly at the state agricultural university level. Learning from the experiences within the country and in other countries, we need to focus on the following key aspects:

1) Develop State-of-the-Art ICT Infrastructure to Connect Key Stakeholders

- Providing Telephone, ICT (Internet) and SATCOM (Satellite Communication linkage), video conferencing connectivity to all States, SAMETIs, Districts, Blocks, State Agricultural Universities, Zonal Research Stations and Krishi Vigyan Kendras
- Provide the required hardware and software to all the above institutions
- Create ICT Training and Consultancy infrastructure at National, State and District level

2) Create ICT Awareness in all Development Departments

- Capacity building of all the extension functionaries and scientists at SAUs, ZRSs, KVKs, Districts and Blocks in ICTs
- Create ICT training material at national and state level training institutions

3) Create Information Packaging Mechanism at Key Participating Agencies

- Capacity building of all the extension scientists at SAUs, ZRSs and KVKs in Information Packaging
- One time digitization of all extension literature of the concerned SAU / ZRS / KVKs in English and one local language
- Integration of Agricultural Marketing Data (including Market Prices, Marketing intelligence and state/District specific Forecasts) with extension information delivery
- Integration of information on allied subjects like Animal Husbandry/ Horticulture/ Sericulture etc. with the extension information (making it holistic for the farmers)

4) ***Network with e-Governance Initiatives of Concerned State/ District***
   - Providing access/ links to "e-governance" sites in the district/ zone/ state
   - Providing links to all general purpose sites to provide area-specific information to the farmers

5) ***Create a Nodal Cell in Each State to Monitor the Progress of Cyber Extension on a Regular Basis***
   - A Nodal Cell with full connectivity with all district and national agencies to ensure appropriate policy input at State Level
   - Providing technical ICT support to all these agencies for a critical period of one year

6) ***Identify a National Coordinating Agency for "Cyber Extension" in India***
   - To provide critical policy support to Govt. of India and technical back-stopping to all Implementation agencies across the country
   - It should be responsible for developing a national perspective; a plan of action, getting it approved from concerned agencies and then be responsible for its implementation
   - Workout a mechanism for 'Face-to-face' or telephonic follow-up of 'knowledge-transactions' on monthly/ quarterly basis among key Research-Extension agencies within a District/ Zone/ State
   - Monitoring of all 'information transactions' among these institutions and also with extension functionaries / farmers for at least one year

MANAGE is thus very consciously involved in consolidating the learnings from all the ICT initiatives in India and abroad and grounding pilot projects to test the economics and the logistics involved in this Projects. This process has to be complemented by extensive 'on-line' networking of "Farmer Service Providing Agencies" up to at least block-level. The experiences of NATP have been very positive in terms of providing connectivity at district level, KVKs and block level. Now we need to make this network operational and also expand the same to other states and districts.

Thus, in India, we have over 20 such initiatives where the information services on agriculture and more importantly on agricultural prices and extension have been successfully tried and tested on project basis. All these projects have, however, been isolated attempts and the time is now ripe to consolidate the lessons learnt from these initiatives to launch a nation-wide or at least a state-wide connectivity or information access project.

ISSUES IN E-ENABLING AGRICULTURE IN ASIA

Rural communities in general and Agricultural Extension in particular require a huge information support to improve the livelihoods in the Asian region. But, unfortunately these sectors are most disconnected. The major issues in taking up rural information networking include:

a) Low paying capacity of the Clientele (making the telecom systems unviable in short run);
b) Large number of small and marginal farmers and diminishing number of Extension functionaries to support information supply;
c) Limited technical knowledge of the grass-root level extension functionaries;
d) Very little or no exposure of the Extension functionaries to use ICTs;
e) Lack of basic infrastructure – electricity and telephone in the rural areas;
f) Irregular supply of Power in Rural Areas;
g) Very little availability of content (locally relevant);
h) Very little or no availability of content in local language; and
i) No co-coordinated attempt at National/ Provincial level to design strategies to take up this task on priority basis.

OPPORTUNITIES

It is not that the situation is so bleak and there is no hope for improving the rural connectivity scenario in rural Asia. In fact, there have been some very significant efforts to correct this imbalance and only in the recent past, the top scientific and space research institutions/ organizations of some Asian countries have done a lot of work to address this situation. For example, in India, the premier technological institutions namely the Indian Institutes of Technology have taken a number of technology generation projects developing innovative technological options to provide rural connectivity at very low cost. The Wireless in Local Loop (WiLL) Technology developed by IIT Chennai is one such technology, which has the potential to provide rural connectivity in Asia and other developing countries. Similarly, Infothela project (Computer and Internet with printer on a Cycle-Richshaw), of IIT Kanpur, the Simputer of Indian Institute of Science, Bangalore and Nice-Top of Pune are products that have been exclusively designed and

developed to cater to the emerging demands of low-cost rural connectivity. These products have now reached beyond the lab testing and field-testing stages and are ready for large scale deployment. Now it is up to development planners – the administrators, and policy makers in Agriculture Ministries to take cognizance of these technologies and make full use of the same, to provide low cost telephone and internet connectivity to the rural population on a large scale. The Development Education and Communication Unit (DECU) of Indian Space Research Organization (ISRO), has also field-tested the utility of one-way video, two-way audio to provide distance-learning support to the rural areas in the country. Now they are in an advanced stage of deploying the state-of-the-art Digital Video Broadcasting Return Channel via Satellite (DVB-RCS) technology to provide seamless two-way video connectivity across the whole country.

Simultaneously, the Ministries of Agriculture and State Agriculture Universities have also taken up a number of steps to improve direct (face-to-face), telephonic, radio and television communication with the farmers in various parts of Asian countries. The starting of call centers in 15 Institutions of excellence is one such innovation. The training of Agriculture Graduates to set up Agri-Clinic and Agri-Business Centers in various parts of the country is another scheme which has caught up the imagination of unemployed agriculture graduates. These trained graduates have already set up over 700 Agri-Clinic and Agri-Business Centres enterprises in the rural areas.

Thus the opportunities are enormous and there is a strong need to take a holistic look at strategic planning to use the resources - the huge infrastructure of agriculture research and education institutions, availability of high quality agriculture graduates, availability of appropriate communication technology, highly trained ICT manpower and of course highly receptive and information hungry rural sector. All we need to do is, to put all the parts of this jigsaw puzzle in the framework and provide the much-valued information and connectivity network in the rural areas.

STRATEGY AND OPTIONS

The experiences and feedback of farmers in all parts of Asia has provided enough evidence that Cyber Extension holds strong potential to improve the efficacy and efficiency of the Agricultural Extension systems. The ICT enabled extension or Cyber Extension is not the replacement of existing face-to-face extension mechanism, it is only a supplement to make the existing mechanisms more effective and economic. The ICTs can help Agriculture Extension, become a more dynamic instrument of a continuous 2-way dialogue with the farmers, on various issues, including agricultural marketing and other forward linkages. A lot has been done to test and validate this hypothesis in the Asian continent and the indications are extremely positive that ICTs can support extension in a big way. Now there is a need to consolidate these experiences and launch countrywide projects to capture and digitize the huge agricultural research knowledge and make it available to the farmers at their door-step in the best possible way. A holistic approach has to be considered for this task. The strategy and options for making the most optimal use of the ICTs in extension must include:

a) The governments (national and provincial both) should play the role of enabler by harnessing the experiences and expertise gained by the existing initiatives across the country (may be from neighboring countries as well) (Khairnar S., 2002);
b) Information kiosks must be promoted at village and taluk levels with private participation. The successful experience of Cable T.V. should be used as a model to promote local level entrepreneurs who invest and run the kiosks from where all the information services can be disseminated;
c) E-government related initiatives/ services must be integrated with the village / taluk level kiosks, to make these sustainable over long-term. The administrative machinery at District level could play a key-role by prioritizing the on-line conversion of as many services as possible and facilitating the usage of ICT enabled delivery modes;
d) The Cyber Extension should be included as a compulsory subject at under-graduate level in the agriculture University curriculum and as a major subject in Post Graduate programs in Agricultural Extension Education;
e) The Agriculture Universities must digitize their research data-base (preferably in local language and English) for faster and wider availability of the same to farmers and other research and extension functionaries;
f) Governments should facilitate the usage of alternative media like television, radio, community radio (e.g. farmers' radio- a one hour dedicated program on local agricultural issues, initiated by MANAGE with support from All India Radio at Hyderabad and Kothamle Radio Project in Srilanka) in rural areas;

g) Human Resources Training and Development for Agricultural Extension functionaries to ensure their continuous updating on latest technologies;
h) There are a lot of technological options for both connectivity and content packaging. Appropriate technology may be selected to implement rural ICT programs. The WILL (Wireless in Local Loop), Info-thela, Simputer and Nicetop are all promising technologies, which have the potential to provide rural connectivity at a very low cost; and
i) There must be a policy level group at each country to plan, implement, monitor and continuously upgrade the Cyber Extension system in each country.

CONCLUSION

Information and Communication Technology (ICTs) offers a very good mix of tools to make Agricultural Extension more effective, more relevant and more credible with minimum investment. The numerous initiatives undertaken in Asia have provided a good testing field to launch major Cyber Extension projects in the primarily agricultural economies. Cyber Extension will enable the hitherto slow-motion rural economies into intelligent, futuristic and vibrant economies, which will contribute more positively to the national development goals. Cyber Extension, thus will help Agricultural Extension to rediscover itself.

REFERENCES

Benor et al. (1984). *Training and Visit Extension*, A World Bank Publication 1984. P-138

FAO (1993). The Potentials of Microcomputers in support of Agricultural extension, education and training. Rome: FAO.

Leeuwis, C. (1993). *Of Computers, Myths And Modeling*: The social construction of diversity, knowledge, information and communication technologies in Dutch horticulture and agricultural extension. Wageningan Studies in Sociology, 36. Wageningen: Agricultural University.

Khairnar, S. (2002). *Status Report on Information and Communication Technology: Eecutive Summary*: Report Presented at Seminar on "ICTs in Agricultural Extension, organised by Directorate of Extension, Ministry of Agriculture, Govt. Of India, at Vigyan Bhawan, New Delhi September 12-13, 2002.

Samanta R.K. (1993). *Extension Strategy for Agricultural Development in 21st Century*. Mittal Publications Delhi.

Riggs, M (2003), *WAICENT for augmenting IT Application in Agriculture*, Paper Presented at the Regional Workshop, Operationalizing Reforms in Agricultural Extension in South Asia, held at New Delhi, India (May 6-8, 2003).

Odumbe H.H., Hafkin Nancy, Wesseler Gesa, Boto Isolina (2003), *Gender and Agriculture in The Information Society,* ISNAR Briefing Paper 55, September 2002, International Service for National Agricultural Research (ISNAR), The Hague, The Netherlands.

Zipp, W. (1994). *Improving the Transfer and use of agricultural information: A guide to Information Technology*. World Bank Discussion Paper 247. Washington DC: The World Bank.

Annexure I

GYANDOOT.NET
CYBERCAFE-CUM-CYBEROFFICES FOR THE MASSES
SOCIAL ENGINEERING THROUGH INFORMATION TECHNOLOGY
DHAR DISTRICT

Introduction:

On January 1, 2000, Dhar district began the new millennium with a mass-based information revolution. Computers in 21 major centers in five Blocks of the district were connected through an intranet network. These computers have been established in Gram Panchayats. They have been called *Soochanalayas*. From the *Soochanalaya,* user-charge based services are given to the masses and at the same time the information technology related developmental needs of government departments and Panchayats are met free of cost. This intranet has been named *Gyandoot*. People outside the district may avail of some of these facilities as well as other important information regarding the district through the corresponding Internet website of *WWW.GYANDOOT.NET*.

The entire expenditure for the *Gyandoot* network has been borne by Panchayats. The network has been set up at a total cost of Rs. 25 lacs. The system is very cost-effective. The 45 wired villages of Warana in Kolhapur district of Maharashtra set up last year involved a total investment of 2.5 crores. The computer benefits go principally only to the members of sugarcane and dairy co-operatives in these 45 villages. In the *Gyandoot* scheme of things, the twenty-one centers where *Soochanalayas* have been established cater not only to the twenty-one villages proper but also to surrounding 25-30 villages. *Soochanalayas* have been established in the buildings of such Gram Panchayats which are located either at block headquarters or at prominent *haat bazaar* places or are prominent villages on major roads which are important from the point of the catching bus etc. Thus, each *Soochanalaya* caters to approximately15 Gram Panchayats and about 25 to 30 villages. The benefits cover wide-ranging information needs of all villagers, not merely those belonging to co-operatives. Thus, the *Gyandoot* network benfits over half a million villagers living in 311 Gram Panchayats and over 600 villages.

Soochanalayas:

Soochanalayas are 21 client sites / nodes working as rural cybercafe-cum-cyberoffices. Server / hub is a Remote Access Server (RAS) housed in the computer room in Zila Panchayat to be called *Soochana Kosh.* Each *Soochanalaya* provides services to about 15 Gram Panchayats, 25 to 30 villages, 20,000 to 30,000 population. The intranet will cover 5 out of 13 Blocks in the district and 3 out of 7 Tahsils in the district. The *Soochanalaya*s are located on the roadside and are central villages where people normally travel. These *Soochanalayas* cater to over half a million villagers in 311 Gram Panchayats and about 600 revenue villages**.**

Soochanalayas have telephone line connectivity to begin with. The hardware is procured and given to the Gram Panchayat under agreement with the Zila Panchayat. The Gram Panchayat in turn gives it for operation to the *Soochak* under agreement. The Gram Panchayat provides, readies and maintains the building where the *Soochanalaya* is housed. It also provides the telephone and electric connection as well as the furniture.

Soochak:

The person operating the *Soochanalaya* is a local matriculate operator and is called *Soochak.* ***Soochak is not an employee but an entrepreneur.*** *Soochak* only needs maintenance and numeric data entry skills. He needs very limited typing skills since most of the intranet software is menu-driven. He is similar to an STD booth operator.

The *Soochaks* were selected interactively by Gram Panchayat along with representatives from the Zila Panchayat. Three member panels were selected who received training at their own cost at the Zila Panchayat. At the end of the training, the best trainees were selected as *Soochaks.*

He / she will run the *Soochanalaya* at his own cost. He will be working according to an initial one year agreement with the Gram Panchayat. He will not receive any salary. He will bear the cost of stationery, maintenance and electric and telephone bills. He will pay 10% of income as commission to the Zila Panchayat for maintaining the net.

Each Soochak is expected to earn a net income of at least Rs. 30,000 per annum at conservative projections.

Finance & Future Expansion:

The funds for the *Gyandoot* network have come from existing untied funds available with the Panchayats. The sources of the funding are as follows:

- The revenues of Gram Panchayats deposited in *Zila Panchayat Raj Nidhi*
- Annual State Finance Commission share of revenues of Gram Panchayats
- NSAP administrative allotment of Zila & Janpada Panchayats
- Advertisements on pre-printed stationery and website (Rs. 78,000)

Services:

In all the *Soochanalaya* villages, three meetings each were organised with the villagers where in-depth participatory appraisal was done. The design of the services provided was a result of this interactive exercise and was based upon the advice and the felt needs of the villagers. In these meetings, it was learned that due to lack of information regarding the proper *mandi* rates not only in the local *mandis* but in the benchmark *mandis* (where the local *mandi* trader sells his own purchases), the farmers are unable to get the best price for their agricultural produce. Villagers also informed that copies of land records are difficult to obtain since the *patwari* is often on tour and one *patwari* is responsible for several villages. The villager needing a copy of the land records has to go out in search of the *patwari* who may or may not be available on that particular day at his headquarters. For small complaints or for giving applications, people had to go to Block, *tahsil* or district headquarters which resulted in waste of time, money and potential livelihood earnings.

Social Engineering Through Information Technology:

A result of the monopoly of a few people over information and records needed by the common man is exploitation of the common man. In the *Gyandoot* effort, complaints and applications will directly reach the office in a computerized form in organized databases. This ensures that paper would not be lost through negligence or through the connivance of corrupt individuals. Supervisory officers of any level any at any time access the records and this would make instances of files not being put up to officers rare. Further, complaints being in the form of digitized formats, the computers will itself analyze the complaint and send it to the concerned officer without human intervention. Again, upon repetition of any complaint the computer will itself recognize the fact and without being asked it would bring the complaint to the notice of the concerned officer complete with the previous history. As a result, information technology would connect the common citizen and the government / administration in a new bond. In the *Gyandoot* effort, there is a spirit of partnership between the citizen and the government to better manage aspects relating to the citizen's life. Timely information regarding handpumps out of order, fair price shops out of stock or malfunctioning etc. would enable the officers to take corrective action well in time. Again, receipt of replies by the citizen would better unable the citizen to take steps in an empowered fashion to have his grievance addressed.

The monopoly over information and records of irresponsible clerks, inspecting / controlling / supervisory officers or wayward *sarpanchas* would be eliminated and the common man / woman would gain an effective partnership and control in issues of governance which have a bearing on his life. As a result, the *Gyandoot* scheme will result in information technology being used social engineer the citizen-government relationship.

Initial Experiences:

During the trial run of the network since January 1, 2000, several examples of public benefit have come up --

- Farmers in Bagadi village were getting rate of Rs. 300 per quintal from local traders for their potato crop. On taking the rate slip from the *Soochanalaya*, the farmers could not believe that the current rate in Indore *mandi* was Rs. 400 per quintal. They decided that they would take their produce to Indore *mandi*.
- The release of State Finance Commission grants to Gram Panchayats was intimated to them on the same day through e-mail. Ordinarily, the money transferred by the Zila Panchayat into the accounts of the Gram Panchayats was intimated either through post or in the monthly meeting of Gram Panchayat secretaries at the Block level weeks after the transfer of funds actually took place. In the meantime, the Gram Panchayat did not even know that the money had reached its account. Besides resulting in delay of works, non-utilization of funds in time, it also resulted in the Sarpanch and the Gram Panchayat secretary unnecessarily doing rounds of offices of Zila Panchayat or the Block in the earlier system.

- In the interior remote hamlets of Anandkhedi and Umrela, the local guruji / teacher of Education Guarantee Scheme centers had not received their honorarium for the period between March 1999 to July 1999. Upon receipt of this complaint through the *Soochanalaya,* it was learned that the problem had occurred due to a mistake in preparation of pay data. The problem was promptly solved.
- Shankarlal son of Ambaram Malviya resident of Deharisarai village gave an application for scheduled caste certificate. The enclosures submitted by him along with the certificate at the *Soochanalaya* were sufficient in themselves. As a result, immediately upon receipt of his e-mail his caste certificate could be prepared and intimation of preparation of caste certificate could be sent back promptly through e-mail.

Annexure II

"The Information Villages Project : Pondicherry"

The Information Village Project, implemented by MS Swaminathan Research Foundation in collaboration with International Development Research Centre (IDRC), is aimed at bringing the benefits of modern information and communication technologies (ICTs) to the rural population.

Objectives:

The project objective is to assess the impact of ICT in fostering transition to sustainable agriculture and rural development and document their role in promoting the process of knowledge empowerment of rural families.

The specific objectives of the project are:

- To set up six Village Information Shops that enable rural families to access modern information and communication technologies;
- To train educated youth especially women, in rural areas in operating Information Shops;
- To train rural youth in the organization and maintenance of a system that generates locally relevant information from generic information;
- To maintain, update and disseminate information on entitlements to rural families using a blend of modern and existing channels of communication;
- To measure the impact of information shops and ICT through surveys, participatory rural appraisal and other methods and;
- To build models of information dissemination and exchange in rural areas that use advanced information and communication technologies.

The Project is located in the Pondicherry region in South India. A Value Addition Centre (VAC) has been established at Villianur and is functional since February 1998. It acts as the hub of the communication network in the project. Four Village Information Shops have been set up at Kizhur, Mangalam and Embalam, and Veerampatinam.

Value Addition Centre:

The premise is that value addition by professionals to networked information is an important step in enabling rural families have access to it. A small office in Villianur serves as a Value Addition Centre. Villianur is a market center for many hamlets that surround it and is also an administrative node and a road junction. Villianur has been selected based on the access of rural families to infrastructure and markets. Project staff at VAC scans the WWW for useful contacts and technology. Data gathering and value addition to data are carried out here and information is transformed to suit local queries or needs. This is also an exchange point for a variety of locale specific information on health, transport, public events, subsidies, prices etc. Information on developmental programs (entitlements, credit, inputs etc.) and markets is maintained here.

The Centre has two PCs, a scanner and a printer; a telephone line for long distance calling facility. This telephone has dial up access to Internet provided by VSNL. A LAN based on VHF radio has been established with Villianur office serving as a hub handling voice and data. The strategy is to create a wireless network (VHF) in the local area, which connects to a fixed telephone line through which access to Internet is available. From here e-mail can be sent on-line while e-mail to other villages can be received at Villianur and forwarded. There is a reading room with a small collection of books and documents in Tamil on various aspects of agricultural production. A collection of government notifications is also maintained in the centre.

Databases. A number of locally relevant databases in Tamil have been created to meet the felt needs of the rural families on Families below poverty line; Public welfare schemes or entitlements to the rural population.

Village Information Shops:

Four Information Shops have been established at Kizhur, Embalam, Mangalam and Veerampatinam and are linked to VAC. Meetings were held with various groups within the community in each village to identify volunteers who would operate the Information shop and to identify the shop's location. This helped in identifying community's information needs. The shops provide information related to health, credit, input price and availability, transport, market information, meteorological information, information for pest surveillance and agronomic practices, data on entitlements to rural families.

Each shop has a Pentium PC with multimedia, VHF transceiver with a workstation-cum-storage box designed by the project staff, and a desk jet printer. The PC can be connected to the wireless network through a modem and a specially designed interface. Each shop also has a board to display bulletins received on e-mail from the Value Addition Centre. The shop also enables a visitor to make voice call within the region. A circulating library of educational CD-ROMs is maintained by VAC for use in the shops.

In *Kizhur* volunteers were chosen by the general body of the council, which also nominated a 23-member group of 14 men and 9 women to guide the shop's operations. The volunteers, one woman and one man, belong to the elected family which has set aside a portion of their house for the shop. They have been trained on basic operations of PC, handling e-mail and use of HTML.

In *Embalam* all volunteers are women. Each of them spends half-a-day at the shop and takes turns to attend work. The shop is located in the premises of the village temple owned by the community. In addition to bulletins by e-mail this shop also receives Real Audio files containing the same information to facilitate its use by illiterate women.

In *Veerampatinam,* where majority is fisher families, the village has its own panchayat, which has allotted space in its own office for the centre to function from. Three volunteers, 2 women and 1 man have been identified and trained in handling PCs and data communication. This centre receives data on fish aggregation off the coasts of TN and Pondicherry from NRSA. The shops are open on all working days from 9 am to 6 p.m.

Impact :

There has been visible impact of the project in the project and nearby villages:

- A farmer with a plot of 2 acres in Embalam has started cultivating a hybrid variety of paddy, first time in six years, as he was able to obtain information on price of seeds and its availability from the shop at the right time.
- A woman laborer in Embalam could negotiate better for wages, which was partly paid in kind in grain. Knowledge of grain prices enabled her to make sure she got the right quantity of grain as wage.
- Fourteen farmers in Kizhur had their sugarcane crops ravaged in previous 2 years due to red rot disease resulting in losses. This year before planting they established contact with an entomologist through the shop who prescribed preventive measures.

(*Case Study by Dr. V.P. Sharma and Mrs. Lakshmi Murthy, MANAGE, with Thanks to Dr. V. Balaji, the then Project Co-ordinator "Info Village Project" M.S. Swaminathan Research Foundation, Chennai. The authors acknowledge sincere thanks to Shri Mohan , Ms Vijaya Poorni , Ms B. Bhagaylakshmi at VAC Villianur, Ms Usha Rani and Ms B. Sundari at Embalam and Mr. G. Jayakrishna, Ms G. Ezhilarani at Kizhur Information village*)

Annexure III

"**Warna Wired Village Project"**

(Districts : Sangli and Kolhapur, Maharashtra, India)

Warna Nagar, a cluster of 70 villages in Maharashtra is an eye of the "Wired Villages" project. In 1960, a visionary Shri Tahasaheb Kore propagated the idea of co-operatives in Warna Nagar, as a method of achieving socio-economic development. He showed how this could bring all the farmers together, to

share information, increase productivity, and profits. Thus was born the "***Warna Nagar Co-Operative Society***". The society has a Chairman and a Board of Members and is free from political influence and society members are free to elect the board members. There are about eight sub co-operative bodies, working under this main society viz.; Warna Dairy Development Society, Warna Co-operative Bank, Warna Foods, Warna Women's Co-operative society etc. Sugarcane is major crop of this area and most of the sugar production of the two districts Kolhapur and Sangli is processed at this Society. From each village 200 - 300 farmers are registered as society members.

The "Wired Village" project was initiated by Mr. Vinay Kore, son of Shri Tahasaheb Kore and the present Chairman of the Warna Co-operative Society two years ago, actual implementation began in April 1998. The Project has been jointly implemented by GOI through National Informatics Centre (NIC), Government of Maharashtra and Warna Co-operative Society with the share of financial support being in the ratio of 50:40:10. The manpower and maintenance cost is borne by the Warna Co-operative Society itself. The project area is a cluster of 70 villages consisting of 46 villages from Kolhapur and 24 villages from Sangli districts of Maharashtra.

This project has been initiated to serve the information needs on different crop cultivation practices of major crops, sugarcane cultivation practices, pest and disease control, marketing informa-tion, dairy and sugarcane processing information etc. to the farmers, right up to their village level.

NIC, Pune was involved in setting-up the hardware and software and NIC, Delhi established connectivity of WAN links such as VSAT and dial-up connections. The software required for the system such as web page designing, database designing and client based applications used by the farmers such as dairy, sugarcane information systems had been developed by the NIC, Pune.

Network Connectivity

Central Hub:

The Central Hub, which is the main server station of "Wired Villages" is situated in Tahasaheb Kore Institute of Engineering Technology at Warna Nagar. This is equipped with servers based on Pentium II with 64 MB RAM, 4.1 GB hard disk and 32x CD-ROM drive. The 64 kbps bandwidth VSAT connection has been established as a gateway WAN link to NIC, Pune for connecting into their network and into global network. This enables the main computer center to down load information from NIC, Pune or the global network for latest information. The router is used to establish a WAN link to remote computer booths from the main computer center. Presently the router supports 10 simultaneous connections i.e. 10 users can access information at a time.

Computer Booths:

The Computer Booths are serving as information centers for the farmers in their villages. The computer booth is operator by the booth operator and he is the main linkage between the farmers and information gateway center. The information sought relates to crops cultivation practices, land development, pesticides, diseases control details, marketing details, bills payments positions of sugarcane and dairy etc. Currently forty-six computer booths are functioning in Kolhapur and meeting the information needs of the farmers. In remaining 24 villages of Sangli district, computer booths and hardware was setup, and are waiting to link to Central Server Station. Apart from information retrieval, there are two client-based applications, to serve the farmers needs. They are (1) Dairy Information System (2) Sugarcane Information System.

In Dairy Information System, the information on all the farmers, who are part of the dairy system, is maintained. Other details available to members of the dairy cooperatives include the quantity of milk supplied by each farmer, fat content, their billing information and credit details etc. This information is maintained and updated at the central database on daily basis.

In Sugarcane Information System, information on shareholders is maintained. About 200-350 shareholders are there in each village for sugar cane crop. This system maintains the details of the cultivation schedule; quantity harvested and supplied to the society, deductions effected by the Society towards credit, net income due to the farmers is available with respect to each shareholder.

Every village is also linked with the Directorate of Marketing in Pune, which facilitates farmers in getting information on rates of vegetables, fruits and other crops.

The computer booths are provided with a Pentium II computer having 64 MB ram, 2 GB hard disk, printer and an UPS power backup system. A dial-up connectivity with a modem and telephone line has been used to connect the main computer center to retrieve the information, send the queries, grievances to the central server station. The speed of dial-up connection is around 19200 BPS to 28000 BPS and average

connectivity time is about 10 seconds. Telephone charge of around Rs. 350/-, is paid by village level society.

Information Technology Center:

Six Information technology Centers have been established to give training to staff, students and farmers of the village. These centers also function as computer booths and are maintained by a booth operator. The Centers have been provided with six Pentium II computers with configuration of Pentium II, 64-Mb RAM, 2GB hard disk and a dot-matrix printer. A dial-up connectivity with modem and telephone line has been used to connect the central server station to retrieve information, send the queries, grievances to the main center.

NIC, Pune has developed a Computer Based Question Bank, in the local language "Marathi" which will be used to test the Computer knowledge awareness of the students of 5^{th} to 10^{th} standard. These students are being trained to get acquainted with the computer systems. Testing will be in subjects covered in the school like mathematics, science etc. and a certain percentage of marks will be awarded from this test to the final marks of the students. A batch consisting of 5 students will be examined for 1 hour. This center also serves as a computer booth. NIIT is engaged in helping create CDs on different topics which when available will be used at these centers for interactive coaching.

The field officer Mr. Kulkarni V.V., Agriculture Officer, of Panhala village, Kolhapur district expressed that ***Cyber-Extension*** would be the major form of technology dissemination in the near future and added that the advantages of the WAN systems were on spot data availability for different purposes, Avoidance of unnecessary movement of farmers from their home village to data center for different purposes, and access to all the information at village level.

An interaction with a few farmers in villages of Paragoam, Kuralap, Bhariwadi etc. indicated that farmers like the concept. They believe that the information from Wired Computers (WAN) is major source of getting information on crop technology. The ranking given by the farmers for source of information on crop technology, ranks wired computers as the best source followed by field officers and staff, radio &TV, print media and company sales persons. They agree that WAN provides all necessary information on cultivation technology and market situation etc., information is timely, the language is understandable as it is in the local Marathi language, information is reliable and it's not costly. They also agree that it is beneficial not only for big farmers but also for marginal and small farmers. The farmers are expecting some more features to be added like processing of all loan, legal documents etc. from their village wired computers. The farmers are also ready to learn operating computers, if any training is given and are ready to contribute any marginal amount necessary for the maintenance and up-keep of the system.

Booth operators of Paragoam, Bhairwadi, Kuralap and Panhala informed that an average of 20-25 farmers visit the computer booths every day for information on crop cultivation practices and disease control, marketing, dairy and sugarcane billing details etc.

(*Case Study by Bhaskar, G. and Venkateshwar Rao, K., Programmers, MANAGE, Hyderabad, India*).

Annexure IV

District Agricultural Advisory and Transfer of Technology Centres (DAATTCs) (Acharya N.G. Ranga Agricultural University, Hyderabad, India)

Believing in the concept that every research scientist should also be an extension worker in serving farmers, the Acharya N.G. Ranga Agricultural University, Hyderabad works in active association and close co-operation with farmers through frequent farmer-scientist interactions, Joint and diagnostic field visits enabled University scientists to earn good will confidence and credibility of farmers. In order to reinforce and strengthen this mode of approach to solve many problems and complicated issued of farmers with ease, the University reorganized its extension activities by establishing the "District Agricultural Advisory and Transfer of Technology Centers" at all the 22 district head quarters in the state, barring Hyderabad urban district during 1998. Presently each DAATT Centre has 3 scientists having specialized in crop production, Crop protection, transfer of technology and Veterinary. It is ultimately proposed to station eight scientists at each center.

The Objectives of the DAATT Centres:

- To assess the potentials of the district by developing database in order to exploit district resources and developed action plans in cooperation with line departments.
- To assess and refine the technologies generated by the research scientists and their suitability to different farming situations.

- To conduct field diagnostic visit, identify the field problems and provide scientific solutions.
- To organize Kisan Melas in coordination with line departments.
- To extend scientific expertise to the line departments in the conduct of training programs to officials, farmers and input agencies.
- To organize T & V workshops.
- To establish linkages with research institutes and other district units.
- To assist and implement the RAWE program, internship program and RHWE program for Agriculture, Veterinary and Home Science students, respectively.
- To maintain Information Center at each district head quarter in cooperation with the line departments of the district.
- To supply need based scientific/popular information to the line departments on enterprises for their printing/multiplication and distribution to the farmers.
- To coordinate with All India Radio, Television and print media for transmission of needed agricultural information in the district.
- To implement any other extension program that may be taken by the University, from time to time, in coordination with the line departments.

DAATT Centre is an independent unit with senior member as Coordinator. The center is under the overall technical and administrative control of Associate Director of Research of the zone concerned who is in turn responsible to Director of Extension on extension activities of each district center in his jurisdiction.

Major Areas of Functioning of DAATTC:

The District Agricultural Advisory and Transfer of Technology Centre (DAATTC) works mainly on ***Farmer-Extension-Research*** interaction model.

The DAATTC though independent works in coordination and cooperation with the line departments to avoid any duplication of functions.

Areas of functioning of the center shall be decided by the District Coordination Committee which decides joint seasonal action plans of the center well in advance of the *kharif* and *rabi* seasons.

Diagnostic field visit by DAATTC Scientists

The DAATTC will concentrate on the following areas/ activities with the cooperation of line departments in the district.

a) Agriculture/Horticulture/Sericulture

- Assessment and refinement of crop production technologies
- Soil and plant problem diagnosis and remedy
- On farm research
- Vermicompost , bio-fertilizers
- Popularization of biological control of pests on crops
- Developing the database of the district in relation to Agriculture/Horticulture/Sericulture
- Surveillance and forecasting of pests and diseases on continuing basis
- Dissemination of watershed technology
- Production of quality seed/plant material
- Popularization of improved agricultural implements
- Identification and popularization of post harvest and storage technology
- Maintaining farm information and guidance centers

- Practicing sustainable agriculture and environment pollution control
- Acting as consultants in training programs to be organized by the departments
- Implementation of the RAWE progams of the University
- Any other activity suggested by ANGRAU from time to time

b) Veterinary

- Development of district database
- Disease diagnosis and remedy
- Conduct fertility/sterility/specialized animal health camps with the cooperation of line departments
- Poultry management
- Aquaculture/pisciculture
- Fodder development programs
- Acting as consultant to the line departments in training of officials and farmers
- Internship of veterinary students
- Any other activity suggested by ANGRAU from time to time

c) Home Science

- Development of district database
- Women literacy
- Nutrition of rural women and children
- Educating the women in health ,hygiene and sanitation.
- Consumer education
- Identification of food adulteration
- Conservation of energy resources
- Popularization of economically viable and environment friendly agriculture
- RHWE program of Home Science students
- Skill oriented training of women in agriculture
- Any other activity as suggested by ANGRAU from time to time

Common Activities

- Development of district database
- Development of training manuals
- Distance Education
- Village Adoption
- Training of trainers
- Information Centres
- Joint Publication of information materials
- Agri-Business and marketing education
- Coordinate line departments in other programs which help in increasing production and income to farm men and women
- Organization of farmers clubs, *Charcha* Mandals
- Any other activity as suggested by ANGRAU from time to time

In brief, the idea is to entrust DAATTC's with the responsibility of all extension activities of the University namely, on the spot diagnosis and treatment of soil-related and pests and disease problems of crops, training of officials of the departments, organizing *Kisan Melas*, exhibitions, bringing out publication, demonstration, maintained unified information center liaisoning between University and its clientele, implementing, operating and coordinating the RAWE, RHWE, NSS, and such other programs/activities and such other programs/activities of the University.

This new system came into operation commencing with *rabi* 1998-99 and the results are highly fruitful, rewarding and upto the expectations. Already, it has received accolades from many people in the farming community.

On farm training program

Thus researchers will get an opportunity to work in the field, identify location specific problems and to maintain good linkage with farming community of the district. Thus an effective collaboration and coordination of scientists, with extension personnel of state development departments and farmers, DAATTCs of the University effectively test, assess, refine, introduce and disseminate the latest technologies developed by the research wing of the University by demonstrating practical application of latest technologies in farmer's fields.

Demonstrations of practical applications are through ad adaptive trials, on farm trials, first line demonstrations and assessing and refining technologies by conducting on farm research in farmers' fields.

1. BANGLADESH

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INTRODUCTION

Agriculture is the main occupation of the people employing about 70% of the labor force and contributing 32% of the gross domestic product. In the past, Department of Agricultural Extension (DAE) has tried a number of approaches, but they were not always properly organized and hence often not so effective. Systematic development was absent until the introduction of Training and Visit (T&V) system in 1978. The T&V system was a success story to start with, but failed to develop fully as an ideal communication linkage desirable to its farming community.

The stated Mission of the DAE of Bangladesh is "to provide efficient and effective need-based extension services to all categories of farmers to enable them to optimize the use of resources in order to promote sustainable agricultural and socio-economic development."

PRESENT STATUS OF THE AGRICULTURAL EXTENSION SYSTEMS AND TRENDS

The DAE is the largest extension services provider in Bangladesh, and has considerable human and financial resources to offer the best opportunities for facilitating agricultural growth and development.

The government is committed to the continued development of agriculture in order to maintain food supplies for the growing population, provide income and employment for the rural people and protect the environment.

To strengthen the agricultural extension Government of Bangladesh adopted a New Agricultural Extension Policy (NAEP) in the year 1996 with following objectives:

- attain self-sufficiency in food grains
- ensure sustainable agricultural growth
- increase foreign exchanges through agricultural exports
- increase per hectare rice output
- introduce high value cash crops
- improve the quality and availability of seeds
- reduce environmental degradation
- increase fish livestock forestry production
- increase and develop forest resource

1. National Agricultural Extension System

There are a number of agencies in the Public Sector, NGO Sector and Private Sector, which provide extension services to the farmer of Bangladesh. These are DAE, Bangladesh Rural Development Board (BRDB), Bangladesh Water Development Board (BWDB), Bangladesh Agriculture Development Corporation (BADC), Forest Department & Livestock Services and Department of Fisheries. There are also many non-government organizations, commercial traders and input suppliers operating in rural areas of the country. Together all these partners can be seen as comprising the National Agricultural Extension System.

To meet the challenges of the new decade, the DAE reformed its service delivery approach to provide effective and efficient extension service with a view to reduce poverty and increase agricultural productivity. The NAEP came into implementation in 1996.

The major objective of the NAEP is to encourage various partners and agencies within the National Agricultural Extension System to provide efficient and effective services which complement and reinforce each other, in an effort to increase the efficiency and productivity of agriculture in Bangladesh (DAE, 1999).

2. Components of NAEP

There are 11 components of NAEP. These are:

a) extension support to all categories of farmer,
b) efficient extension services,
c) decentralization,
d) demand lead extension,
e) working with groups of all kinds,
f) strengthen extension research linkage,
g) training of extension personnel,
h) appropriate extension methodology,
i) integrated extension support to farmers,
j) co-ordinate extension activities, and
k) integrated environmental support.

3. The Implementation Strategy for NAEP

The DAE has designed the strategic plan to support the entire policy framework of the Government of Bangladesh (GoB) including the New National Agricultural Policy. The DAE strategic plan for 1999-2002 sought to achieve 68 major objectives under six themes; these are: (i) extension approach development, (ii) partnership development, (iii) main streaming gender, (iv) main streaming environment, and (v) information system development. .

Despite many constraints, a considerable achievement has been made in the implementation of strategic plan.

The DAE remains committed to the Revised Extension Approach (REA) as the foundation for service delivery on the basis of five specific objectives to be achieved by 2006.

4. Objectives of REA

- To increase agricultural productivity
- To provide pro-poor services
- To strengthen partnership and links with local govt.
- To develop DAE as an effective institution to provide quality and quantity services
- To develop performance measurement

1) To Increase Agricultural Productivity

The DAE has set the following priorities under this component:

a) *Food Security*: The DAE will work closely with the poor, to assist them in crop and non-crop activities (livestock and fish, agro-forestry, etc.) and develop mechanism for addressing food security by 2006.
b) *Input and Credit Support*: The DAE will continue to serve as a liaison agency between farmers and other organizations both public and private suppliers for proper distribution of credits and quality inputs timely at a fair price.
c) *Crop Diversification*: The DAE will develop crop diversification mechanism and encourage farmers to grow diverse crops instead of a single (mono) crop.
d) *Appropriate Land Use*: The DAE will identify and promote appropriate land use patterns to ensure optimum land use.
e) *Soil Health*: The DAE will motivate farmers to improve soil health through different programs using various extension methods.
f) *Sustainable Agriculture and Environment*: The DAE will promote environment management through participatory community based environmental resource management for sustainable agriculture development.
g) *Commercialization*: The DAE will develop its role in promoting commercial agriculture among rural/farming communities.
h) *Opportunities for the Non-Farms Economy in Agricultural Development*: The DAE will encourage in strengthening backward and forward linkages in rural non-farms activities for creating opportunities in non-land based agricultural development through NGO's and private sector.

2) To Provide Pro-poor Services

Poverty reduction is an important priority of Government of Bangladesh. The DAE will develop a people-centered development approach where people themselves will be the primary actors for eradicating hunger, poverty and other entities by 2006. The following are two important interventions to achieve this.

a) *Targeting*: The DAE will emphasize non-land based activities for landless farmers and at the same time focus on-farm activities for small, marginal, landless women and unemployed youth.
b) *Gender Awareness*: The DAE will encourage participation of women in decision-making process for agricultural development, especially income generating activities.

3) To Strengthen Partnership and Links with Local Government

A number of institutional mechanisms to encourage partnership between different types of agencies have been developed. These mechanisms include Union Agricultural Committee (UAC), Upazila Agriculture Extension Co-ordination Committee (UAECC), District Agriculture Extension Programming Committee (DAEPC), and Agriculture Technical Committee (ATC) at union, upazila, district and regional level, respectively including bilateral MoU with Government Organizations (GOs) and NGOs and private organizations.

At the national level, NATCC (National Agricultural Technical Co-ordination Committee) and EPICC (Extension Policy Implementation Co-ordination Committee) are vital for partnership development.

4) To Develop DAE as an Effective Institution for Providing Quality and Quantity Services

The DAE has nine wings under the control of Director General (Figure 2). The wings are Field Service Wing, Cash Crops Wing, Food Crops Wing, Plant Protection, Training Wing, Administration & Personnel Wing, Planning & Evaluation Wing, Project Implementation Wing and Water Management and Agricultural Engineering Wing. Efforts will be made to effectively coordinate the work of all the wings to achieve the goals of NAEP**.**

5) To Develop Performance Measurement

The DAE will review the existing system and develop unified Monitoring and Evaluation systems with simple and few indicators that will reflect the performance of extension service.

Beside the DAE, other GOs and NGOs are providing extension services to the farmer for food self-sufficiency and income generation.

5. Extension Services in Livestock Sector

Extension system in livestock sector has been poorly developed since the beginning of agricultural development activities in Bangladesh. The main reason is the dependency of people on rice as major food. The Department of Livestock (DLS) is the key Government extension agency for providing services and supplies to the farmer. The DLS is headed by a Director General with five Directors, heading five divisions. The extension work is carried out by Upzila veterinary persons as a routine work. The upazila veterinary personnel visit the villages and veterinary aid centers. Bangladesh Livestock Research Institute (BLRI) has its own limited extension activities to disseminate innovations and techniques in Livestock Research.

6. Extension Services in Fisheries Sector

The Department of Fisheries (DoF) is a government organization providing extension services to the farming community to increase the production of sweet water fish in the ponds, homestead ponds and other water bodies. It is headed by a Director General and is supported by five Directors/Principal Officers. They are (a) Director of Inland Fisheries, (b) Director of Marine Fisheries, (c) Principal Scientific Officer (Fisheries Resource Survey System), (d) Principal Scientific Officer (Fisheries Inspection and Quality Control) and (e) Director Training.

7. NGOs in Agricultural Extension

NGOs have introduced many interventions covering various fields of development activities such as credit and savings, agriculture, livestock, fisheries, forestry, education, family planning, housing, nutrition and health. In carrying out the activities they have their own extension approaches in reaching the target population.

8. Agricultural Research System in Extension Services

Apart from the formal extension system, the Research Institutes under the National Agricultural Research System (NARS) also disseminate technology and information through their extension network of adaptive research, on-farm research and other collaborative extension activities.

9. Agricultural Education in Extension Services

Different Agricultural Universities and Technology University of Bangladesh also have their own extension, research and training activities throughout the country.

Strategic Facts and Trends

Bangladesh has made significant gains in agricultural development, doubling food grains production and obtaining food self-sufficiency (Table 1) in recent years (1999-2001). This has been largely due to improved agricultural productivity as a result of better seed and fertilizer management, expansion of irrigated area and also due to effective agricultural extension services. Total food grain production rose from just under 15 million tons in 1981 to around 25 million tons in 2001 with an associated decline in real wholesale rice price.

The contribution of agriculture to the Gross Domestic Product (GDP) is declining in line with economic diversification, falling to 25.2 percent in 2000. Likewise, the crop share of agricultural GDP is also declining as agricultural itself diversified. As of 2000-2001 crops contributed 56 percent of agricultural GDP, livestock 12 percent and fisheries 25 percent and forestry 8 percent..

Although agriculture sector has become more productive and diverse, farm size is becoming smaller, and number of marginal and small farmers has increased by 2.8 percent per year resulting in a decline in medium and large farmers.

METHODOLOGICAL TOOLS CURRENTLY EMPLOYED FOR AGRICULTURAL EXTENSION IN BANGLADESH

During 1977-78 the DAE used Training & Visit System (T&V) as a means of technology transfer, initially this system was introduced in the northern part of the country and it was gradually applied to the whole of Bangladesh.

The system was implemented successfully at the field-level. The T&V however had the following limitations:

- Lack of participation of farmers and field-level extension worker in the planning process.
- Extension programs rarely took care of the small and marginal farm families.
- The massage did not "trickle down" from the contact to the non-contact farmers as was expected in the concept of the T&V system.
- Linkage between research and extension education was inadequate to provide the farmers with appropriate impact points.
- Farmers' technology and indigenous knowledge was not taken care in the system. Information needs of the farmers were not emphasized and the impact points were mostly developed without considering the felt needs of the locality.

To overcome the above-mentioned weaknesses Agricultural Support Services Project was introduced in the DAE with the following revised extension approaches, i.e. group approach, during 1990. The revised extension approach is mainly based on following key principles:

- Decentralization
- Responsiveness to farmers needs
- Working with groups
- Using a range of extension methods
- Targeting

The methodology used to disseminate the extension messages to the farming community is:

- Program planning: The DAE field staff involves local farmers groups in the seasonal problems census or other meetings through which local problems and priorities for extension programs were identified.
- Demonstration and field day: Although most demonstrations take place on a single farmers' holding, they are only effective as an extension tool if they are seen by other farmers. Field staff invites groups of local farmers to field days at demonstration sites at key stages in the growth of the demonstration crop or practices (believing by seeing).
- Farmers' training: Training in a new skill and practice is an important part of extension work. Much of this training goes in short, informal sessions on farmer's holding.
- Farm walks: Inviting a group of farmers to visit a farm where an innovation has been adopted or a problem solved, gives them an opportunity to learn from the farmer's experience and to discuss among themselves whether they could adopt the technology.
- Motivational tour and visit: Extension workers select members from farmers group to participate in tours and visits. This maximizes the impact of such events on farmer in the area.
- Meeting: When a specific problem or issue arises in the area, field staff invites farmers to a meeting or arranges meeting of an existing group, to discuss the problem and agree on a course of action.
- Field extension workers invite farmers to attend Upazila and Dist. fair.

A case study of this approach is highlighted (Table 3) for clear understanding of its present status.

- Farmers field school (FFS): is another tools to disseminate extension activities among the farmers.

A field course named as Farmer Field School (FFS) has been introduced through IPM. The concept behind an FFS is to bring together a group of farmers regularly in a field to do practical structured learning exercises that allow them to combine local knowledge with specific ecological approaches. All courses are hands on practical and field based using the field itself as a teacher. The FFS participants (usually about 25 people) meet regularly throughout the season of a particular crop, to learn about agro-ecology and to decide how to manage the studied crop. The extension worker works as a facilitator for the participants.

Some weaknesses of the methodology are:

* Low level of literacy and awareness among the farming community did not allow them to raise their voice in prioritizing real problem, they faced.
* Field extension workers generally emphasized the large and medium farmers for disseminating technology. On the other hand, the socio-economical status of small and marginal farmers does not allow them to replicate the full package of demonstrated technology, thereby, there exists a clear gap of adoption of technologies among the farmers.
* Most of the demonstrations are organized on a sporadic basis, which some time fail to communicate real message to the large segment of farmers.
* Due to lack of accountability the grassroots level extension workers did not take care of their responsibilities in their working area.
* Farming households in Bangladesh are generally involved in many agricultural enterprises, which are covered by different extension providers. FFS concept has some limitations to bring significant benefit for integrated farming particularly for small and marginal farmers.

Suggestions:

- Mass literacy program or adult education program should be taken up to strengthen the farmer's awareness.
- As small and marginal farmers constitute vast majority (about 80%) of the farming community, they should be targeted through a definite plan of action to harvest their talent for sustainable agricultural development in Bangladesh.
- Field demonstration should be organized as block demonstration, so that, large number of farmers of all categories get access to the benefit.
- Grassroots level extension worker should be made accountable to the local Govt. (Union Parisad) as well as to the department, for their low level of participation in helping the farming communities in their respective working areas.
- FFS concept should be tested to see the impact among the farming community. As farmers are the major participants in the school, their opinions and problems should be given due consideration.

SUCCESS/FAILURE STORIES RELATED TO THE PROVISION OF AGRICULTURAL EXTENSION SERVICES (AES) TO FARMERS

Through the introduction of Integrated Pest Management (IPM), a training model called Farmers Field Training School (FFTS) has been developed by the DAE which is being used throughout the country. The innovative training model to involve the farmer in IPM practice is an important achievement of the DAE. The DAE has been successful in building capacity by developing a large number of core IPM trainers who include the staff of DAE, NGOs and farmers . In addition to these activities of the human resource development, the IPM projects of the DAE have been active in the establishment of IPM field schools for farmers and school children, development and promotion of IPM farmers clubs and in testing and usage of biopesticides, bio-control agents and other indigenous technologies. The most important aspect of IPM in Bangladesh is to enable the farmers to make their own decision of pest management tactics to be used in their own plots.

Empirical evidence in Bangladesh suggests that during boro 1995 a total of 3275 farmers of 681 field schools were able to reduce the use of pesticides by 90% in terms of money per hectare. They used 76% less pesticides than non -IPM farmers and managed to increase their rice yield by 17% compared to

period before IPM training. The IPM farmers produced 9% more rice than their fellow farmers at the non-IPM field during the same season. Another study showed that 144 farmers during boro season on 1993-94 in Mymensingh District indicated that the farmers with IPM training increased their income by 30-35% by integrating fish culture with the rice farming.

Data obtained during boro 1992 by interviewing 2950 farmers from 59 field schools before and after the FFS intervention revealed that the farmers after IPM training reduced their pesticide use by 89% and saved 79% of their pesticide application cost. Regarding rice yield it was noticed that the farmers on an average produced 3.55 tons of paddy/ha before IPM training and 4.79 tons/ha after training. This made a yield increase of 35%.

During the period between 1995 and 2003, the percentage of increase of total rice production was much more than the percentage of increase of total area covered by rice cultivation (Table-1). Much more increase of both area and production in case of wheat is visible. Popularizing wheat, both for cultivation and as major food was an important task of extension. Extension did this job very successfully backed by research. Potato, another new crop for Bangladesh also shows a similar result over the period. Justifying the contribution of extension in technology diffusion and food habit changes of rural people. During the period, the cropping intensity has also increased from 150 to 190. As regards the amount of adoption of major production inputs by the farmers as chemical fertilizer, pesticide, area coverage by irrigation and improved seeds of major crops also exhibit positive contribution of extension in agricultural technology dissemination. The task of increased distribution of technical inputs to the farmers (through demonstration, training and other motivational approaches) and related increased production of agricultural commodities over the period provide evidence regarding the impact of extension services in the development of agriculture in Bangladesh.

The DAE has also initiated many activities specifically towards female farmers, these include:

Training in gender sensitive extension for all field staff is one of the 9 core courses for implementation of the revised extension approach; the targeting of 30% of extension resources towards women as well as a series of highly successful contracting arrangements with NGOs mainly focus on homestead gardening activities.

Extension support is not yet provided to all categories of farmers, because more than 60 percent farmers are landless and marginal. They have not been grouped and adequate extension programs are not developed according to the needs of the farmer.

An efficient extension service is only one link in the chain of services which have to be made available to farmers for increasing production. Others include research inputs, farm credit, tenure improvement, fair price and adequate marketing for agricultural commodities. These services largely depend upon effective functioning of institutions external to the ‘extension’. The successful extension work, therefore, depends upon a number of external factors which need to be taken into account in judging its effectiveness.

ISSUES AND PROBLEMS IN FURTHER ENHANCING AES IN BANGLADESH

The green revolution in 1974 made tremendous contribution in the dissemination of High Yielding Varieties (HYVs) of rice, wheat and maize along with other input packages around the world, particularly in Asia. During this era, Bangladesh also adopted several HYVs of rice and wheat along with other essential technology packages such as irrigation, chemical fertilizer and pesticides, etc. With the introduction of modern varieties of rice the productivity has increased manifold. During the past three decades, agricultural production has increased from 15 million tons to over 25 million tons. But this production level is half of the potential harvest. The present increase in production is due to the adoption of HYVs of rice (55% of the harvested rice area) along with package technology. But further intensification is likely to add pressure on land, soil, water, environment and other essential resources. At this point the extension agencies, both GOs and NGOs have a great role to play, which is not easy. By now many new generation of problems have already come up. These are loss of soil fertility, low organic matter content (more than 60% possess below 1.5%) in the soil, low level of nitrogen in almost all soil types, deficiencies in P, Zn, S, B and other micro nutrients, lowering of underground water level (might has caused arsenic problem), nutrient imbalance, environmental hazards, eradication of indigenous technologies and cultivars. The erosion of genetic resources is an important problem in the country. In early 1960s there were more than 8500 cultivars of rice, which have now been reduced to only a few dozens. In addition, flood and drought are common in the country. To combat all these problems, although DAE claims to have a lot of field-level workers but in reality it is much below the requirement, unless the modern information technologies are applied by all the GOs and NGOs at the field level for the development of agriculture.

Present extension services seem to be poorly organized in meeting the needs of the challenges ahead, keeping in view the constraints and resource scarcity. Moreover, the interface between extension, research and education remains a critical area of concern to increase the efficiency of extension services. The DAE and other extension agencies including NGOs also lack linkages with he educational institutions, specifically with Agricultural Universities and Colleges.

One of the serious problems to carry out agricultural extension work in Bangladesh is the presence of several Ministries who are directly involved in providing assistance to the farmers without much coordination with the Ministry of Agriculture. This creates management problem and confuses the farmers. NGOs donor agencies and even the front line extension workers, work with different Ministries. The absence of functional and active participation of local government is also a big limitation in the extension system of the country. The role of local government could facilitate, to a great extent, the management process of agricultural extension and development activities, if it could be involved.

To face the emerging challenges of serving farming community in a coordinated manner, the following suggestions are made:

a) increase per hectare yield maintaining soil health;
b) strengthen the provision of specialist services to the farmers;
c) strengthen the educational activities on vocational, technical aspects;
d) strengthen and improve genetic resources management;
e) improvement of water and balanced fertilizer management;
f) promote block-based farming with emphasis on high value crops;
g) strengthen IPM activities;
h) launch effective media campaigns;
i) address environmental issues as a part of agricultural development strategy;
j) strengthen partnership with other GOs, NGOs, higher educational institutions; and
k) develop sound marketing system for both in country and exports.

REFERENCES

Awal M.A. present problems of Agricultural Extension works. Bangladesh Journal of extension education, vol. 2. An evaluation of the district partnership initiative fund, vol. 2, Nov. 2002.

Ali MM, G.E. Jones and Rolls M.J. (1997) Interaction patterns of farmer Extension worker in the T&V Extension system. The demand and supply dimension. Bangladesh Journal of extension education, vol. 9. 1994-97.

BBS (2000) Statistical Year Book of Bangladesh, Bangladesh Bureau of Statistics, Ministry of Planning, Bangladesh.

DAE (1995) Agricultural Extension Manual, Ministry of Agriculture, Bangladesh.

DAE (1996) Agricultural Extension Manual June 1995.

DAE (1996) New Agricultural Extension Policy, Govt. of the People's Republic of Bangladesh, Ministry of Agriculture.

DAE (1999) Agricultural Support Services Project Final Report.

DAE (2002) Hand book of Agricultural Statistics, May 2002.

DAE Strategic plans 2002-2006 The Development Agricultural Extension.

Halim A. Kaida Yoshihiro (2001), Agricultural Extension in Southeast Asia, Historical Review.

Islam Shahidul M. (1987) Agricultural Extension in Bangladesh country paper presented in the conference of the Heads of National Extension Institutions of the commonwealth countries held on April 26, May 01, 1987 in Colombo.

Kashem M.A. (1987) Alternative Approach to Extension under the framework of the Training and Visit (T&V) system in BD, Bangladesh Journal of extension education, vol. 2.

Mahboob S.G. (1987) *Research in Agricultural Extension in Bangladesh. Journal of extension education, vol. 2.*

M. Mofakkarul Islam, M.A. Hamid, M. Mahbubul Haque and M. Afzal Hossain,*(1999): FFS paradigm Empowering farmers for sustainable Agricultural Development proceedings of the symposium on Agricultural Extension Services 21st century: needs and challenges, 15-18 May 1999.*

Table 1. Production of Major Food Crops and Adoption of Major Production Inputs by the Farmer

(Area in lakh* hectare and production in lakh M.tons)

Year	Production of major crops						Adoption of production inputs			
	Rice		Wheat		Potato		Cropping intensity	Improved seeds (M.tons)	Chemical fertilizer (M.tons)	Total irrigated area (ha)
	Area (ha)	Production	Area (ha)	Production	Area (ha)	Production				
1	2	3	4	5	6	7	8	9	10	11
1995-1996	98.068	168.34	4.52	8.90	0.0013	0.0267	173.18	37450	3022.69	3513000
1997-1998	102.63	188.62	8.05	18.03	1.36	15.53	175.71	27893	2732.48	3938800
1998-1999	101.17	199.05	8.82	19.08	2.45	27.62	174.73	35664	2824.92	4138000
1999-2000	107.08	230.67	8.32	18.40	2.43	29.33	175.52	27475	3212.00	4506000
2000-2001	107.97	250.86	7.73	16.73	2.49	32.16	180	36267	2991.26	4583000
2001-2002	106.60	243.01	7.42	16.06	2.38	29.94	185	-	3262.00	
2002-2003	109.37	263.06	6.65	14.62	3.1857	43636	190.00	37105	3001.00	

* One lakh = 100,000

Source : BBS (Bangladesh Bureau of. Statistics)
DAE (Department of Agricultural Extension)

Table 2. Future Challenges

Year	Population (Crore*)	Land per head (hectare)	Food requirement (Lakh** M.Ton)	Expected Production (Lakh** M.Ton)
2000	12.72	0.066	224.0	260.84
2005	13.65	0.065	229.5	272.10
2010	14.40	0.061	243.8	304.00
2015	15.31	0.056	257.5	321.00
2020	16.122	0.053	271.0	337.00
2025	16.89	0.047	284.0	350.00

* One crore = 1,000,000 ** One lakh = 100,000

Source : Bangladesh Rice Research Institute, Joydebpur, Gazipur

Table 3. Normal Activities Performed by a Field Extension Worker

Work item	No. of days/event	Farmers contacted	Total time (hours)	Remarks
Demonstrations	14	26	260	
Field days	25	260	125	
Meetings	50	1000	200	
Farmers home visit	144	4320	864	
Input distribution	30	26	60	
Training days	5	150	25	
Office visit	52	-	Full office time	
Seminar/Workshop	Occasionally	-	-	
FINA	1	25	7	
Agricultural rehabilitation	3	15	24	

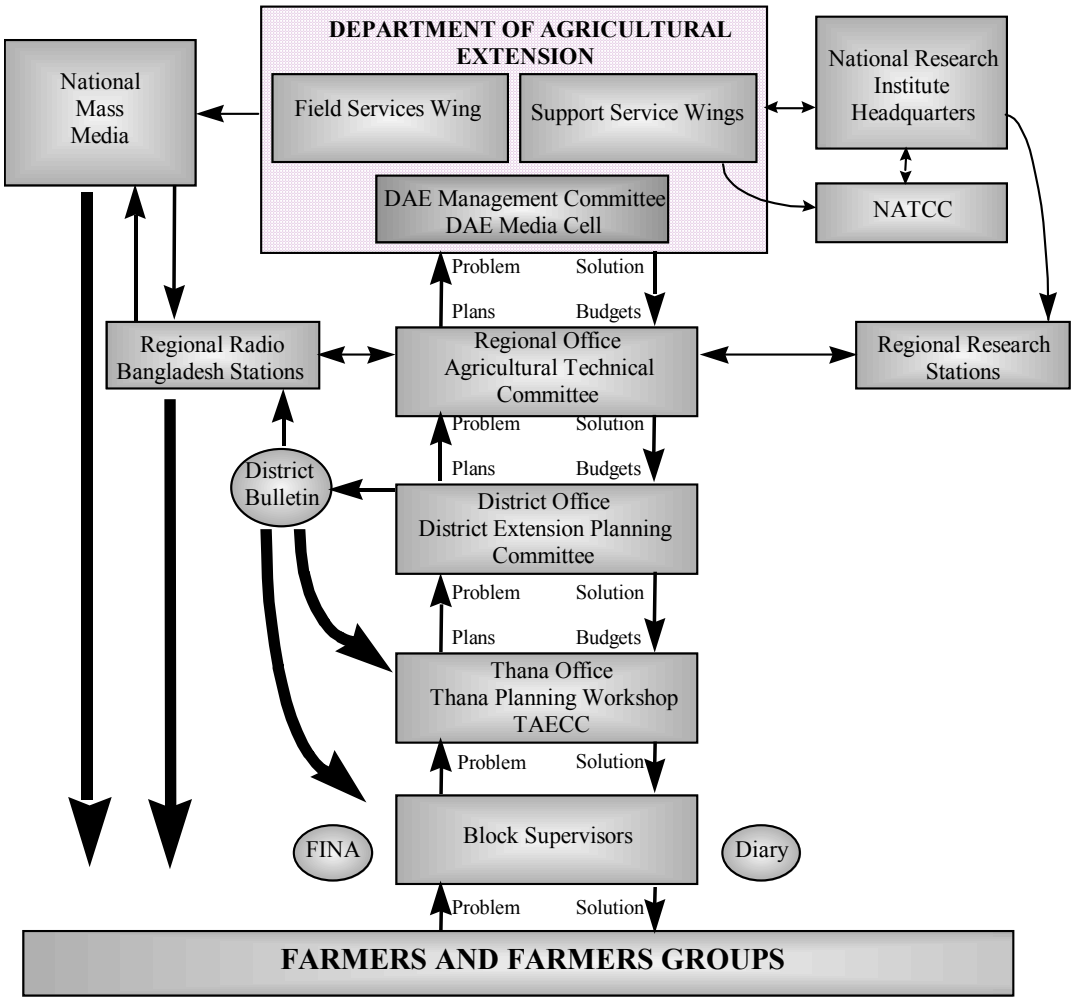

Figure 1. Flow of Development and Extension of Technologies in Agricultural Field

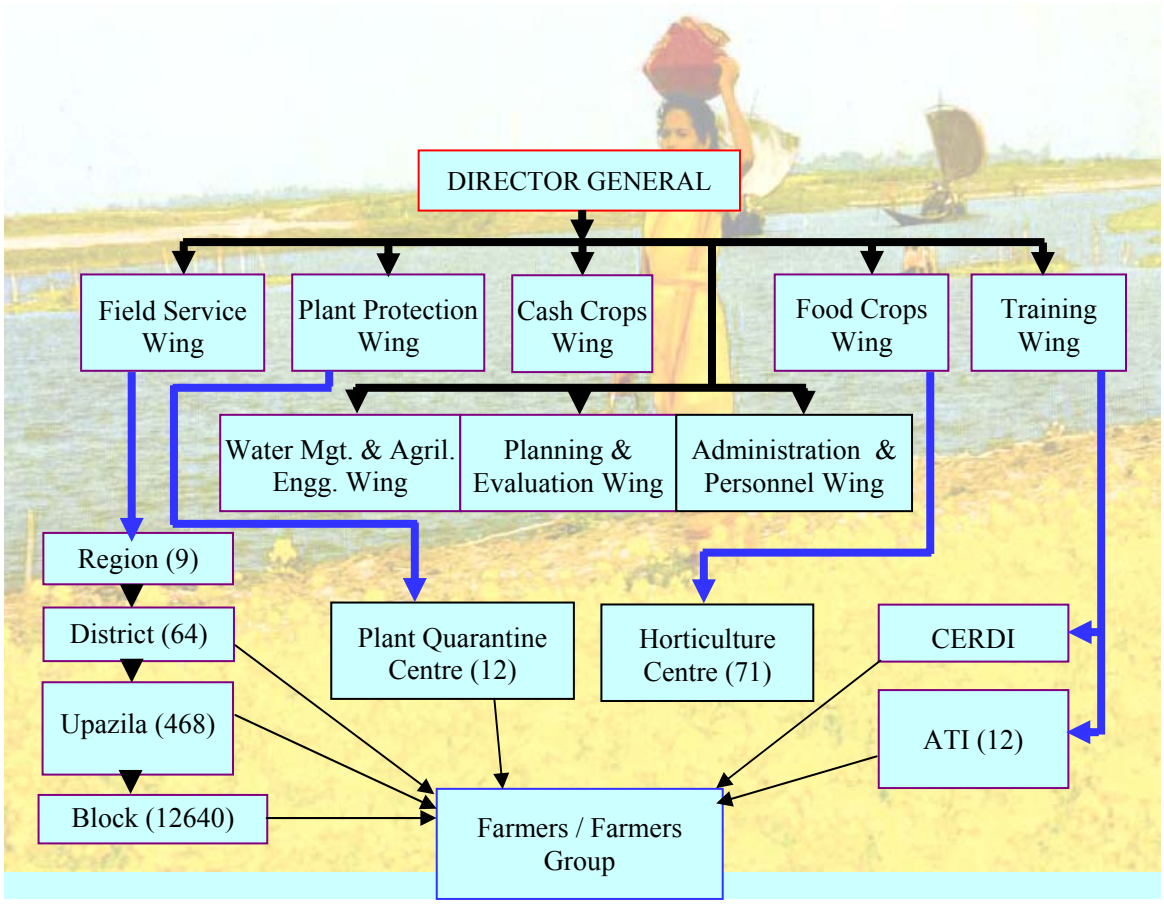

Figure 2. Organizational Structure of the Department of Agricultural Extension

2. INDIA (1)

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INTRODUCTION

Agricultural Extension Services in India have contributed significantly in the areas of increased food production and in allied sectors. The first planned attempt started with the launching of Community Development Programme in 1952, followed by the National Extension Service in 1953. These programs were able to educate responsive farmers to take up improved methods of farming across the country. The other important Area-Based Programmes were; Intensive Agricultural District Programme (IADP, 1960), Intensive Agriculture Area Programme (IAAP, 1964) and High Yield Varieties Programme (HYVP, 1966) besides Farmers Training Centres (1967) to train farmers on high yielding varieties and improved methods of farming to back up the above programs. The cumulative effect of these programs resulted in increased productivity, which made way for the era of 'Green Revolution' during late 70s.

However, these programs also brought out the increased disparity between high resource resourceful and low resource farmers. In order to enable low resource farmers to take benefit of improved farm technology, many client-based programs were introduced. The most important ones being; Small Farmers Development Agency (SFDA, 1969), Marginal Farmers and Agricultural Labourers Programme (MFAL, 1969), District Rural Development Agency/Society (DRDA, 1976), Integrated Rural Development Programme (IRDP, 1978), Lab to Land Programme sponsored by ICAR (LLP, 1979). Although, these programs were able to improve the socio-economic conditions of beneficiaries, they were isolated and implemented in a phase wise manner. The historical background of agricultural extension systems in India is given in chronological order at Annexure I.

Realizing the importance of improving research - extension linkage and the efficiency of the extension system, the Training and Visit (T&V) system of extension was introduced in India during 1974 with the financial assistance from World Bank. This also enhanced agricultural productivity in the country. Watershed Development Programme (1984) was the other massive area based program implemented in selected rainfed areas of the country funded by both central and state governments. The program is continuously refined and implemented with the help of funds from international agencies. This program was able to bring about considerable improvement in the productivity and stability of the income of the farmers in rainfed areas through increased crop productivity, dry land horticulture, forestry and forage components.

The Indian Council of Agricultural Research (ICAR) also launched many Training of Trainers (TOT) programs to facilitate speedy transfer of technology to farmers. Some of these are; National Demonstration Scheme (1964), Krishi Vigyan Kendra (1974), Operational Research Projects (1975), Lab to Land Programme (1979), Frontline Demonstrations (1991). The latest in the series is Technology Assessment and Refinement Pilot Project (TARP) - through Institution Village Linkage Programme (IVLP) in 1995. State Agricultural Universities (SAU), which were started during seventies, also initiated limited extension services mainly to supplement and complement the extension efforts of development departments in the respective states. During late nineties, many NGOs in the country took up extension work to promote agricultural technology for the benefit of farmers. Many input agencies, financial institutions, commodity boards and of late private consultancy services have contributed towards accelerating food production and increasing net income of farmers in the country. As a result, the country was able to realize record food production of 205 million tonnes by 2000 as against 50 million tonnes during 1950s.

Though, India was able to achieve self-sufficiency in food production, this has mainly come from adoption of 30 per cent of improved farm practices by farmers according to a report brought out by Desai and Reddy (1989). The availability of vast technology and its limited adoption indicates great potentiality to increase farm productivity in India. There are many reasons for such low adoption of farm technology, but the prominent one was less appropriateness of farm technology evolved to meet different socio-

economic situations of farmers, diverse climatic conditions, risk prone areas, market orientation, etc. The farm technologies generated did not have the participation of farmers, and this resulted in less relevance of technology generated. In order to fill this major gap, the ICAR launched TARP through IVLP during 1994-95 to enlist stakeholder's participation in the technology development process for sustainable and profitable farming. During the first phase, the project was implemented in 44 centers across the country under Cess Fund provided through ICAR, while in the II phase, it was extended to another 34 centers, but funded by NATP. Extension professionals considered this program implementation as a center extension work.

CONCEPT OF TAR-IVLP

TAR-IVLP is a process of assessing the available technology (both outside and within the social system) refining and fine-tuning such technologies under different complex, diverse and risk prone (CDR) situations with the participation of beneficiaries.

JUSTIFICATION OF THE PROJECT

1. Although considerable efforts have been made to generate technologies both by SAU's and ICAR institutes, besides a host of other related organizations, all the technologies have not been adopted by farmers in the country. According to a survey conducted during late nineties, only 30 per cent of the technology was adopted by farmers in the country. The question then arises why farmers do not adopt a large chunk of technology.
2. There is no doubt that the research system has generated very useful results for synthesis of appropriate technology for farmers. However, it has not been possible to develop and integrate the results in the form of appropriate technology for different production systems, the essential conditions of which are inadequate understanding of the farming situations, resource availability and needs and aspirations of farmers having different socio-economic and cultural background. This is mainly due to lack of appropriate scientist-farmer linkages. This project expects to overcome these shortcomings.
3. Earlier, there was a belief that technologies are scale neutral. This is now well appreciated that the farming conditions are different from place to place and the technologies have to be according to the needs and conditions of different farming situations. It is also well understood that the technologies have to be location specific, need based and must be compatible to socio-economic and cultural milieu of different farming communities. The technological requirements vary with farming conditions. New and highly location specific production system problems are emerging.
4. The value addition in agricultural produce with simple techniques is the need of the day in order to augment the income of farm families. These points, however, have not been addressed fully in earlier efforts. The present project intends to cover these aspects as well.
5. Identification of the extrapolation domains for new technology is a crucial stage in the agricultural development process, but it has received little attention so far. Hence, there is an urgent need for simplified methods that can assist researchers and extensionists to specify relevant extrapolation domains. Further, the feedback received in the past was not adequate enough to reset the research and transfer of technology agenda. The project while in operation, will bring out adequate feedback on a concurrent basis in addressing the issues in a more comprehensive manner.

OBJECTIVES

The objectives of the project are as follows:

1. Assessment of crop, livestock and agro-forestry based production system to attain stability, sustainability and profitably without affecting the environmental issues.
2. Assessment of technologies to solve the gender specific problems and quality improvement of produces to derive higher income.
3. To study and understand socio-economic factors relating to technology adoption and suitable refinement to identify domains for extrapolation of refined technologies.

The objectives were used as a frame of reference while formulating the program. The guidelines issued by the council from time to time were used to develop the program. The instructions /guidance provided by zonal steering committee were also used to refine and improve upon the interventions of the program.

STEPS IN THE IMPLEMENTATION OF TARP (METHODOLOGY)

1. ***Participating Institutions*:** The project is implemented by the ICAR Institute Headquarters, SAU Headquarters, Regional Research Stations/Zonal Research Stations of the ICAR Institutes and SAUs and KVKs including some of those under NGO. The participating centers identified are that have the required infrastructure facilities in terms of a multi-disciplinary team of scientists, laboratory facilities, training material and vehicles.
2. ***Constitution of the Multi-Disciplinary Team of Scientists*:** There shall be a multi-disciplinary core team and an optional team of scientists in each center. The core team would consist of one scientist each from agronomy, soil science, agricultural extension, plant protection, animal science, home science, horticulture, plant breeding, agricultural economics and agricultural engineering. The optional team shall consist of fishery, biotechnology, post harvest technology, agro-forestry and other disciplines depending upon the need of the area. For disciplines that are not available at the implementing center, efforts need to be made to get the services of experts from the nearby SAU/ICAR Institute/centers or from the headquarters of the SAUs/ICAR Institutes.
3. ***Selection of Villages*:** Each participating center is to identify and adopt one village or a cluster of villages to cover about 1,000 farm families. The selected village or cluster of villages should be representative of the district, should not be far away from the center. It must be approachable by road for frequent visits by the scientists. Villages that have primary institutions like cooperatives; schools, panchayat, etc. shall be an added advantage for having better linkages in the program. The status of the present level of farm production systems and farming situations should also be taken into account while identifying the village(s), the idea being to give preference to agriculturally underdeveloped village having a representation of all the three production systems.
4. ***Benchmark Survey*:** The benchmark survey is an important activity before the program is launched. The survey provides information about the resource availability with the farmers and also forms a base to plan the work. It will also help in evaluation of the program and offers an opportunity to know the impact of the project in the area.
5. ***Training Activities*:** The multi-disciplinary team need to be provided adequate training on the concept and operation of the project. To complete this, the steps followed were:
   a. Identification of core trainers at the ICAR Headquarters and zonal levels,
   b. Development of course/training curricula for the core trainers,
   c. Preparation of training materials for core trainers,
   d. Training of core trainers at ICAR Headquarters and zonal levels,
   e. Preparation of operational guidelines at ICAR Headquarters for implementation of the project,
   f. Developing training plans which may include venue, duration, tentative calendar, etc. for the scientists of core and optional teams, and
   g. Implementation of training programs for the multi-disciplinary team of scientists at the zonal and regional levels.
6. ***Plan for Technology Assessment and Refinement*:** In small production systems, emphasis is on fine-tuning of technologies for different farming situations and environments through on farm research. In well-defined production systems, the emphasis is on farm trials/testing and demonstrations. In the entire program, the emphasis is to develop multiple options (Basket approach) for different target groups through participatory approaches. In case of small production systems, foremost priority was on agro-eco-system analysis including rainwater availability. Based on this analysis, and with the identification of Indigenous technical know-how (ITK), the areas will be categorized into favorable and unfavorable eco-systems and low cost technologies will be preferred especially in later situations. On-farm research to be conducted in different situations with a view to increase productivity along with stability and risk minimization.
7. ***Technical Activities*:** The broad technical program of the project is as follows:
   i) Agro-eco-system analysis for resource characterization for different farming conditions of the selected areas.
   ii) Tailoring of appropriate technologies matching with the prevailing farming conditions of small production systems.
   iii) Collection and assimilation of information on integrated farming systems for augmenting farmer's income through supplementary enterprises.
   iv) Testing of research information to tailor technological options for different production systems.
   v) Refining high production sustainable technologies for well-defined production systems.
   vi) Collection, classification and development of data base information suitable for application in commercial production systems.

vii) Technology refinement and tailoring for reduction of drudgery and also for increasing efficiency and income of women farmers.
viii) Development of appropriate expert information system, including market intelligence for various agri-business options.
ix) The delineation and characterization of environment based on bio-physical and socio-economic parameters at meso and mega levels using own survey data, secondary data and GIS data base for identification of extrapolation domains for different technologies/technology modules.

8. ***Monitoring the Project*:** Monitoring of the project will be done with the help of the following committees:
   a) Central Steering Committee
   b) Zonal Steering Committee
   c) Farmers' Club
   d) Organizing Committee
      i. 10 farmers' representatives (small production systems, 3 men + 2 women; well endowed production systems, 2 men + 1 woman; and commercial production systems, 1 man + 1 woman) - Members
      ii. Local block level officials - Members
      iii. Scientists of multidisciplinary team - Members
      iv. Team Leader - Convener
9. ***Evaluation*:** The concurrent evaluation of the project will be done with the help of selected Core Team members. They provide feedback on ongoing programs, identify shortcomings and suggest improvements to overcome the shortcomings at the center itself.

IMPLEMENTATION OF TARP-IVLP AT KVK, HASSAN, KARNATAKA

1. Status of Site Village

KVK Hassan comes under the jurisdiction of UAS, Bangalore. The TAR project was implemented by following the guidelines issued by the ICAR from 1996 onwards. The first phase of the project lasted for three years (1996-97 to 1998-99) and was implemented in Malali village with 338 heterogeneous families located in Hassan district of Karnataka. There were 323 agricultural families with 388 ha of total cultivable area distributed 80 percent under rainfed and 20 per cent irrigated farming. The village is located in Zone-VI, receiving an annual rainfall of 700 mm with bimodal distribution. The soil type is gravely to sandy loam. Major crops grown were ragi (finger millet) with niger and avare (*Dolichos lab lab*) as inter crops while castor as intercrop in Potato. Paddy is grown under irrigated condition. The vegetables grown were beans, bendi and greens. The subsidiary occupations include dairy, sheep rearing, poultry and piggery. The average productivity of crops and other enterprises were far below the district and state average. The failure of second crop after potato during Kharif was a common feature of the area.

2. Problem Diagnosis and Prioritization

The agro-ecosystem analysis, problem identification and prioritization was done through PRA techniques in the initial stage. Many problems were diagnosed and they are:

a. Low yield in ragi and potato,
b. Failure of second crop after potato,
c. Poor fertility status of soils,
d. Drudgery in various farm operations,
e. Low profit from subsidiary enterprises, and
f. Under employment among women and youth.

3. Causes for the Problems Diagnosed and Solutions Identified

Low yield in ragi:

a. Traditional variety of ragi
* Improved varieties of different durations
b. Wider spacing
* Compromised spacing
c. Low fertility status
   - Crop rotation
   - Enriching the existing farmyard manure (FYM) by better method of composting
   - Green manure crops

Low yield in potato:

- Low fertility and severe incidence of pests and diseases
- Integrated nutrition management

- Compatible cropping pattern
- Integrated pest management

Drudgery in various farm operations:

- Use of improved sickle
- Ragi thresher
- Maize cob Sheller

Low profit from subsidiary enterprises:

- Introduction of improved fodder varieties
- Animal health care
- Introduction of new breeds of birds, piggery and sheep

Under employment among women and youth:

- Value-addition through chips making in potato
- Nutrition garden
- Additional subsidiary enterprises

4. Results of the Interventions Promoted

The technologies relevant to each family situation and the village were implemented continuously during 1995-96, 1996-97 and 1997-98 by involving all the 338 beneficiaries, local institutions and concerned officials of development departments. The refinement was done continuously and results are summarized as under.

***Interventions in Ragi*:** There was an increased yield of ragi to the tune of 42.5 per cent over benchmark due to the introduction of new varieties of ragi and 49.42 per cent due to modified spacing. All the potential farmers in the village adopted the technologies and during the second year it started moving horizontally to neighboring villages. According to reports available, more than 50 per cent of the area was covered by 2001 with this technology in zone VI, which has an area of 4.1 lakh ha. under ragi. The area under ragi was reduced to two third in IVLP village and replaced area is covered with pure crop of ground nut/ red gram (pigeon pea) or inter crop of red gram with groundnut and also potato. Further crop rotation was followed with the leguminous crops. The two interventions were able to revolutionize productivity, increased income, nutritional standards, improved soil fertility and helped generate additional employment opportunities.

***Interventions in Potato*:** The balanced nutrition in potato was able to increase an yield of 35 per cent over check which was stabilized gradually in the subsequent years. Redgram as intercrop was found to be an excellent crop combination and it has increased the net income of potato growers per unit area. The area under intercrop system has increased rapidly in less than three years in the potato growing belt, spread over in 26,000 ha. of crop grown annually during Kharif. The other reasons for continued adoption were improvement in fertility status and no competition between the crops because of slow growth of redgram in the initial stage. The IPM approach was well received by the majority of potato growers but the rate of spread of this technology was relatively slow. Horsegram (short duration leguminous crop) as second crop was found to be an appropriate crop since the yield was assured besides improving soil fertility.

***Change in Cropping Pattern and Economic Benefits*:** The area under ragi was reduced considerably, since the production level of ragi maintained stability with two interventions. The replaced area was gradually taken over by high value crops like potato, groundnut and redgram. The added net income was Rs.800,000 per annum for the village with the change in cropping pattern.

Table 1. Change in Cropping Pattern and Economic Benefits

Crop	Area covered in different years (ha)			Added net income(Rs.)
	1996-97	1997-98	1998-99	
Ragi	190.2	164	122	-
Potato	64	78	92	4,90,000
Groundnut	-	10	32	2,40,000
Redgram	-	4.8	14	70,000
Intercrop of redgram with potato	-	16.8	52	-
Inter crop of redgram with groundnut	-	4	26	-

***Other Interventions*:** Among the other interventions, farm forestry, improved sickle, Japanese method of compost making, rearing of birds and value addition through chips making were well received and continuously adopted by the farmers and farm women enabling stability of income, additional employment generation, minimizing drudgery, social equity and improving nutritional status. Nutrition garden could not be established successfully due to the menace of birds.

Table 2. Results of Major Interventions Taken Up at Malali Village

Interventions details	No. of repli-cation	Yield (kg per hectare)								
		1996-97			1997-98			1998-99		Average
		BMY	AY	IIY	BMY	AY	IIY	AY	IIY	
Crop; RAGI Evaluation of high yielding varieties of ragi GPU-28, HR-911 and balanced application of fertilizer	91	875	1250	42.85						42.85%
Maintaining required plant population 30 cm x 15 cm spacing • Intercropping with redgram • Intercropping with avare • Azatobactor treatment • Balanced application of fertilizer based on soil test results					1250	1865	49.2	1860	49	49.00%
Crop: PADDY • Evaluation of HYV's paddy • Seed treatment with azatobactor • Balanced application of fertilizers • Bavistin to control blast disease	47				1500	2250	50	2000	33	41.66%
Crop: REDGRAM Introduction of redgram will result in higher profit to the farmers. • Use of IPM	21				250	400	60	350	40	50%
Crop: POTATO Treatment with Dithane M-45 to potato • Balanced application of fertilizers	75	5000	6750	35						
• Redgram intercropping with potato • Seed treatment with mancozeb • Recommended quantity of fertilizer based on soil test results • Plant protection measures using carbaryl and DM-45 • Use IPM in redgram intercrop					6750	9060	33.3	10050	48.14	40.7%

NOTE: BMY = Bench mark yield; AY = Assessment yield; IIY = Increase in yield (%)

5. Educational Methods Used

All the available extension methods were used extensively in a professional way to educate the farmers and extension personnel of the area. However, the most frequently used extension methods were field walk, home visit, group discussions, meetings, training programs, study tours, field visits, field days, campaign and exhibition, besides write up on the walls of temple. These important interventions, introduced in the village facilitated the spread of technology at a faster rate. The bimonthly visit and interaction of the workshop team to the project area was facilitated at the opportune time. The press, Doordarshan (Indian Government run Television Channel) and Radio coverage was used at the crucial stages. In view of intensive extension work, it was possible to spread the relevant technology in the entire zone in the shortest possible time.

6. Enlisting the Participation of Stakeholders

The biggest challenge before the team was enlisting the participation of all concerned.

***Organizing Committee*:** An important committee representing a cross section of farmers, development departments' officials, members of core team and local institutions, was constituted. The committee met once in a fortnight, to review and discuss new programs in the village by utilizing a combination of appropriate extension methods and aids. This committee played an important role in developing the need based comprehensive program by meeting at regular intervals as well as its effective execution followed by facilitating evaluation by beneficiaries.

SUMMARY AND CONCLUSION

The technologies identified were multidimensional, need based and appropriate to different production systems, which approximates to "Farming System Research". The assessed and refined technologies were not only profitable, eco-friendly and practicable but also these were sustainable, hence they started diffusing at a faster rate in the entire zone. The benefit of technology was able to reach all sections of the community and hence it was able to fulfill social equity and economic security. The recommendations brought out by the center are a testimony to the success of the project. The success was mainly due to PTD approach and effective extension strategy followed to implement the project. Therefore, it is appropriate to start TAR project in all the zones of the country to make full use of indigenous and outside technology by farmers for their sustained development in the respective zones. This could be experimented in other Asian countries.

FUTURE STRATEGY

The country has achieved a break through in food production and productivity, but the socio-economic conditions of a large majority of farmers did not improve proportionately. Therefore, the future thrust of extension work and research in extension has to be;

1. Extension work	**Strategy**
1) Marketing extension including value addition and processing	All extension organizations to devote 25% of their work on marketing extension
2) Farm women and youth empowerment extension organizations	Thrust in all extension work by various
3) Facilitating formation of low resource base farmer's groups and extension strategy to promote them	Pilot project work to be initiated and replication through existing extension organizations
4) Information and communication technology	Training used facilitating the use of ICT by all extension personnel.
5) Facilitating private extension service	Training of farm science graduates
6) Extension education on environmental issues	All extension organizations to devote 10 percent of their work
2. Extension research	**Issues**
1) Farming system based extension research	Extension professionals in SAUs and ICAR TOT units to generate data base information

2)	Cost effectiveness in the use of various extension methods and aids	Extension researchers to generate database information
3)	Accountability in extension work	Extension researchers to generate database information
4)	Federation of extension organizations in each country	Extension researchers to generate database information

REFERENCES

Anonymous, 1995, *Technology Assessment And Refinement through Institution – Village Linkage.* Division of Agricultural Extension, ICAR, Krishi Anusandhan Bhavan, New Delhi.

Anonymous, 2001, *Annual Progress Report of the KVK, Hassan*, UAS, Bangalore.

Desai, G.R. and Reddy, M.R., 1989,*Operational Constraints In The Management Of Agricultural Extension. Journal of. Rural Development., NIRD, Hyderabad, India,* 8(3): 299-308.

Sawant, G.K., 2003, *The Changing Roles Of Agricultural Extension In Agricultural Development*. Memorial Endowment Lecture presented at IAT, Bangalore, India.

Annexure I

Historical background of Agricultural Extension Systems in India

Sl. No.	Name of the program and year	Features and achievements	Limitations
1	C.D., 1952	- First planned program - Administrative set up at block level - Team of Development Officials - Training Centers were started - Contributed for increased food production	Govt. initiative, Lack PPs
2	NES, 1953	- Educational arm of C.D. - First Extension Education work was done systematically - Contributed for increased food production	Inadequate staff, Responsive farmers benefited
3	IADP, 1960	- Package program - Intensive extension work - Contributed for increased food production	Irrigated districts
4	IAAP, 1964	- Intensive work - Contributed for enhancing food production	Inadequate staff
5	HYVP, 1966	- Promoted HYV and hybrids - Increased area under HYV and hybrids	Green Revolution, widened gap between rich and poor farmers
6	FTC, 1967	- Training of farmers and farm women - Both on campus and off campus - Improved K&S	Limited numbers
7	SFDA, 1969	Assist small farmers to adopt IFP	Inadequate institutional support
8	KFAL, 1969	- Assist MFAL to adopt IFP - Attention to subsidiary enterprises	Inadequate institutional support
9	DRDA, 1976	Assist both SF and MFAL to IFP with inst. Support	Inadequate staff to manage the program
10	IRDP, 1978	Agriculture and non-agriculture activities for PBPL	Phase wise, Inadequate coordination
11	LLD, 1979 ICAR	- Scientists were involved to implement - Critical inputs were given free of cost	Selected places around SAUs and ICAR centers
12	T&V 1974	- Better research extension linkage - Accountability in extension work - Increased productivity	Only agriculture Later on, horticulture and allied sectors

13	WDP, 1984	- Rainfed areas (70%) intensive effort - Soil-moisture conservation - Agriculture, horticulture, forestry - Administrative arrangement	Inadequate follow up, Limited participation of people, Later LMC
14	ICAR TOTPs a. NDS, 1964 b. KVK, 1974 RKVKs, 1999 c. ORPs, 1975 d. LLP, 1979 e. FLDs, 1991 f. TARP, 1995	- Scientists involvement - Demonstrate production potentiality in an unit area - (in built) Flexibility - Need based - Contributed for empowerment of men, women, FY, GRLWEs - To refine technologies evolved from research system - Focused crops and technology in priority sectors	Selected places, Limited in numbers, Selected pockets
15	SAUs a. EEUs b. Monthly and bi-monthly workshops c. Publications	- Ist stage demonstrations, Block demonstration, Whole farm demonstration - As part of T & V system - Train officers of SDA - Training staff through STU, etc.	
16	NGOs, 1989	- Better involvement of people - Use of PRA and other techniques	Inadequate technical competency
17	Input Agencies, Financial Institutions, Commodity Boards	Supplement and complement efforts of other agencies to enhance food production	Isolated efforts

3. INDIA (2)

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INTRODUCTION

Research and extension are the pillars of agricultural development in India. Agricultural extension has completed four decades of its existence making substantial contributions to development. In India, farmers are supported with many sources of extension services. Extension services are offered by Government, through institutes, directorate, research centers and others like input companies, NGOs, agro-processors, farmers' associations, cooperatives and private consultants. Effective dissemination of research results through extension is evident from the food sufficiency achieved as a result of increased agricultural production in the country. India has tripled her food production over the last four decades, to reach the present level of 195 million tons per year due to its extension efforts and contribution of scientists in green revolution.

The discipline of agricultural extension education and the supported extension services are unique in its structure and function. It has not been restricted to a single program and activity but has been allowed to adjust according to the changing needs of the situation and time of the society. To meet the challenges of agricultural development there is an urgent need to redefine the structure and functioning of the agricultural extension system. However, to make agricultural extension more viable and an efficient tool of technology transfer, several issues need to be addressed.

CURRENT STATUS OF AGRICULTURAL EXTENSION SERVICES (AES)

Agricultural extension promotes development by providing extension functionaries and farmers with information, training and other extension support on a continuous basis regarding improved production technologies. The Extension Division of the Department of Agriculture and Cooperation and specific programs lays down major policy guidelines on extension matters and the Directorate of Extension, a nodal agency at the national level, implements activities. The Directorate of Extension implements these extension programs and activities through following four technical Units of the Directorate Extension, Management Extension and Training, Farm Information and Farm Women Development Programme.

The Extension Management Unit of the Directorate of Extension is responsible for the Strengthening of Agricultural Extension Services in the country. The profile of extension services in India, that supports extension activities to reach the grassroots level, includes the following organizations (Figure 1).

1. State Department of Agriculture

India is a federal democracy with Union Government at the national level and State Governments at state level. The Union Government is involved in taking macro decisions on the subject of Agriculture, but basically, agriculture is a state subject. Line departments include various state departments such as agriculture, horticulture, animal husbandry, dairy development, fisheries and sericulture. Line department staff makes routine visits and pass technical messages on what needs to be done in crops. The Department of Agriculture (DOA) activities in all the states are constrained by inadequate operational funds. Most of their time in implementing of a number of state and central sector programs that have some input / subsidy delivery. Almost all services are free.

Out of the 80,800 village extension workers, 78,000 belonged to the DOA in 1988 (Misra, 1990). Presently the state employs some 1,10,000 extension staff of whom around 20% are graduates (ICAR, 1998).

All the States are encouraging NGOs to take up extension activities. The DOA, Rajasthan has extended an invitation to NGOs to take up extension work in any defined extension unit such as a cluster or an AAO circle. Under the agricultural development project, the functioning of three AAOs circles was handed over to three NGOs, i.e., GDC Research Foundation, Jaipur, Social Policy Research Institute, Jaipur and Jandhara Trust, Jaipur. Many NGOs are given grants by the government for specific projects such as watershed development.

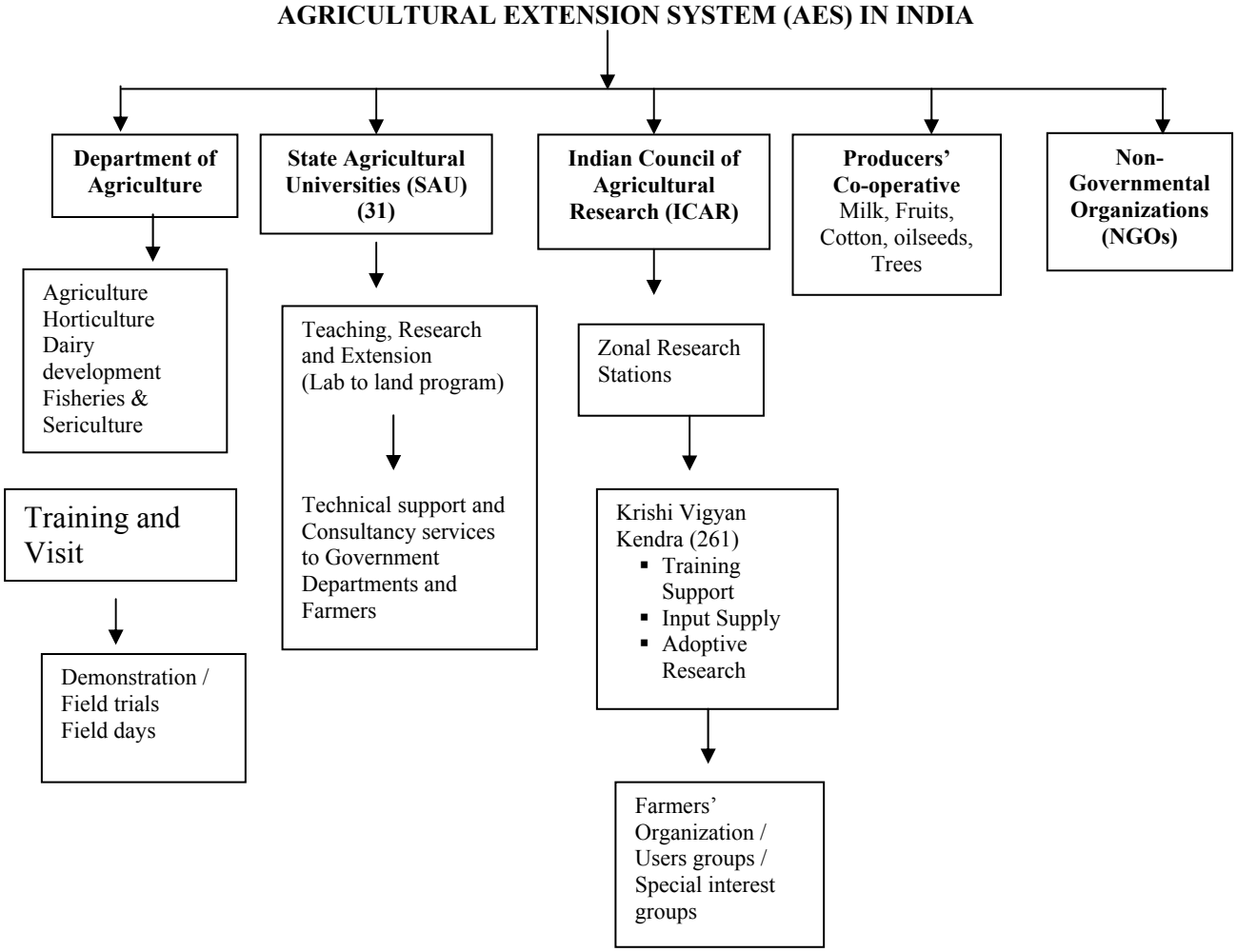

Figure 1: Agricultural Extension System (AES) In India

2. State Agricultural Universities (SAU)

There are 34 agricultural universities in the country. The universities perform three major functions namely teaching, research and extension. The major extension role of the university is to provide technical support, training and consultancy service to government departments engaged in agricultural development work and to farmers in special cases

3. Krishi Vigyan Kendras (KVKs)

KVKs have an appropriate mix of multi-disciplinary expertise including specialists in important areas. Currently there are 261 KVKs in the country of which 27 are in ICAR institutes, 139 in SAUs, 86 in NGOs and remaining nine under Central Universities and Agricultural colleges. The KVKs are presently being actively encouraged to generate additional resources some KVKs while started charging for their training, sale of planting materials, seeds etc, some went one step ahead like Vidya Bhavan, KVK, Udaipur in getting resources for adaptive and socio-economic research programs from donors abroad like Ford Foundation and NORAD. All these are expected to make many of the KVKs financially sustainable even after the complete phasing out of government funds. Though many KVKs have started charging for their training, this has not diminished the demand for KVK training.

4. Trainers Training Centers

Eight training centers are subject-specific training institutes in dry land agriculture, horticulture, agricultural engineering and home sciences.

5. Agricultural Extension through Farmers' Organizations

User groups, including farmers' organizations, farmer clubs, commodity growers associations, young farmer's clubs, women farmers groups, special interest groups etc are expected to be effective institutional devices for creation of client driven agricultural research and extension system. Often, farmer's associations are the starting points for the development of producer's cooperatives. Commodity

specific farmers associations exist in very few commodities in India The idea is to encourage farmer's groups to organize different types of services for themselves, including input supply, credit and or technical services and marketing arrangements – activities that would increase their productivity and incomes, while decreasing their dependence on government (ICAR, 1998)

6. Producers' Cooperatives

Producers' Cooperatives are often formed to improve the marketing prospects in specific commodities where market operators are a disadvantage to producers. They provide farmers the advantage of the economies of scale by bringing together produce from individual farms and marketing the same. Some of these organizations also provide extension services to its members. Various cooperatives that function at the district and state level deal with agricultural crops like cotton, oilseeds, fruits and trees. Most successful among the producers cooperative in India are the milk cooperatives.

7. Agricultural Extension through Voluntary Organizations

With a view to augment the coverage and efficiency of extension services, the efforts made by selected NGOs are integrated with main extension services through this Central Sector Scheme. Initially, the scheme was implemented on a pilot basis by involving 14 NGOs from 8 States. The scheme was extended to 50 NGOs, during the Ninth five-year Plan covering more number of States in a phased manner. During 1999-2000, 16 additional NGOs were selected taking the total number of NGOs to 30. The remaining 20 NGOs were selected during the year 2000-01 achieving the full target of 50 NGOs.

The following approaches are being used in the country by various agencies for extension:

8. Research-Extension-Farmers Linkages

Under this scheme, interfaces between the Department of Agriculture and Cooperation (DAC) and the Indian Council of Agricultural Research (ICAR) at the National level are organized on Pre-*Rabi* and Pre-*Kharif* basis to evolve joint strategies for research and development. Through another scheme called Farmers-Scientist Interface on Agro-climatic basis, a forum is provided for direct feedback from the farmers. These Interface sessions are organized both for *Kharif* and *Rabi* seasons at National Agriculture Research Project (NARP) Centers.

9. Monitoring and Evaluation (M&E) of Agricultural Extension

Under this scheme, national seminars/workshops are organized every year to discuss policies and programs related to agricultural extension. The computerization of extension information is being augmented by providing the existing facility of M&E Units, training of officials and developing connectivity with other related agencies through National Informatics Center (NIC).

10. Documentation of Indigenous Technical Knowledge (ITK)

The main objectives of the scheme are to identify the available indigenous technology developed by the farmers based on their experience and local conditions and document them on agro-climatic zone basis for validation. The scheme is implemented through 27 State Agricultural Universities. During the ninth five-year Plan (1999-2000), an amount of Rs. 500 thousand was released to 10 State Agricultural Universities located in 6 NATP States viz. Andhra Pradesh, Bihar, Maharashtra, Himachal Pradesh, Orissa and Punjab. During 2000-01, 10 additional State Agricultural Universities have been selected, expanding the area in the state of Assam, West Bengal, Haryana, Karnataka, Madhya Pradesh, Gujarat, Karnataka, Bihar and Rajasthan.

11. Human resource Development-Training Support to Agriculture

Training is a major component of Human Resource development (HRD) and an important factor in improving the overall efficiency of the extension services. The Training Unit of the Directorate of Extension has been conducting systematized training planning and management exercises at Regional/National levels to prepare a calendar of training programs based on the training needs of various States/UTs. There are four regional level Extension Education Institutes (EEI's), one apex national institute – National Institute of Agricultural Extension Management (MANAGE), Hyderabad, in India to cater to the training of senior and middle level officers.

12. Training of Extension Personnel in India

The National Training Courses (NTC) have been organized at selected SAUs, ICAR Institutes, Centres of Excellence for Training (CETs) and other Institutes in the Subject Matter Areas of Agriculture, Horticulture, Animal Husbandry, Agri-Forestry, Fisheries etc to improve the technical competence of subject matter specialists for their effective job performance.

13. Training and Visit Program

Training and Visit (T&V) is an extension approach, which concentrates on the transfer of scientific agricultural knowledge and technology from research institutions to farmers. Subject Matter Specialists (SMS) give training to frontline extension agents on new but simple technical issues. Extension agents visit contact farmers to deliver the technological messages.

T&V was the favored extension approach of the World Bank in the 1980s and 90s. Its goal was to increase crop production in controlled environments (e.g. irrigation schemes). Early experiences have shown quick production increases in cotton, rice and wheat in India

The main objective of T&V is to increase agricultural production. The strategy is based on the assumption that farmers lack adequate knowledge, or even hold false knowledge, which inhibits production increases. The solution is to make scientific and technical knowledge and solutions available to the farmers.

Training and Visit extension system transfers scientific agricultural knowledge to farmers. The management of such transfers concentrates on disseminating standardized extension messages concerning selected crops or livestock. Research institutions produce the messages and the extension service disseminates them. Close links are thus established between research and extension organizations.

T &V system was in operation in 17 states in the country till late 1990s.

14. Demonstrations and On-farm Trials

Demonstrations have bearing on wider application of technologies by farmers. On farm trials on the farmers' fields prove efficacy of the package of practices developed at the research station to suit local situations. The method has proved beneficial in disseminating learnings from the trials for larger interest in the field, e.g., use of composting techniques, varietal trials etc. Demonstration continues to be one of the most favorite methods of extension at grassroots level.

15. Field Training and Farmers Day

Trainings update farmers with innovations such as improved varieties of crops, improved techniques, postharvest management of crops etc., which lead to increased productivity and, quality of the produce. Farmer's days are planned to expose the community to interact with farmers and to share their experiences in the agriculture and allied fields. Organizing farmers day serve in bridging the gap between scientists and farmers. All the SAUs in the country organize Farmer's Days every year (sometimes every season).

16. Dissemination Tools

Leaflets, audiovisuals, mass media, television, radio, video conferencing, internet kiosks (e-chaupals, cliks), etc are some of the communication tools to reach the grassroots level community**.**

SALIENT ISSUES AND PROBLEMS

1. Appropriate Technologies for Rural Areas

In India, 70 per cent the farmers belong to resource poor category comprising marginal and small farmers. Problems of these farmers were not taken into consideration by agricultural, researchers, development workers and policy makers while designing and developing the package of technologies. Past experience reveals that technologies should fit with requirements of the farmers and farming situation. There is greater variation among the farmers with respect to their socio-economic situations, cultural set ups and infrastructure available. In view of this location and situation specific interventions/ technologies should match the given farming system.

2. Technology Transfer

Several studies in India have been done to develop transfer of technology models for effective functional linkages between researchers and the farmers. There are two types of models: 1) Linear Model of TOT, and 2) The Circular Model of TOT. The Linear Model of TOT, envisages simple and linear relationship between research, extension and farmers. Technology is viewed as a product that is originated by researchers, transferred by extension workers and adopted by farmers. The model proves to be inadequate for effective transfer of technology to the farmers. The circular model of TOT envisages a two – way dialogue model, which could be most appropriate, considering extension department, nature of technology, farmer's needs and priorities, and resources.

3. Linkage among Stakeholders

Research-extension and farmer linkage will act as the backbone for implementing participatory methodologies at the field level. Emphasis is on developing linkages with other systems such as NGOs, farmer's organizations and Govt. agencies. To strengthen interaction between research and farmers there is

need for institutional mechanism, joint planning and implementation, which will increase functional linkage and participation among stakeholders.

4. Gender Issues

The contribution of women labor force in agriculture, particularly dairying is significant. The technology related to agriculture and dairying must reach women, as their role in farming and livestock activities is very important. From efficiency and equity point of view technology related to agriculture and dairying must reach to women farmers. Inadequate involvement of women in development process, training and lack of gender appropriate technologies is one of the factors that need to be addressed. Whenever this has happened we have had good success stories. This has happened in Kheda District of Gujrat for example.

5. Services to Resource Poor Farmers – A Case Study

Increasing productivity of resource poor farmer is a challenge, on the background that soils are marginal and farmers have low ability to invest in cost expensive inputs like fertilizers. In the situations, to improve fertility of the soil through use of biological inputs is the only alternative as the inputs are cost effective and eco-friendly.

In view of this, some State Governments (like Maharashtra, Gujarat, Rajasthan and Karnataka) announced free distribution of biofertilizers for oilseeds and pulses under the oilseed and pulses development program. This has promoted the use of biofertilizers in majority of the States.

For effective use of such important biological input in the field farmers need to be made aware of technical matters and precautionary measures. This increases effectiveness of input at farmers level. In the absence of extension efforts, technology was not much accepted in the field even by the resource poor farmers as awareness on benefits and motivation on the part of the extension workers was lacking in the promotional efforts by the department.

Similar experiences on watershed and natural resources development programs can be documented to indicate change in the strategy in program implementation to ensure expected outcomes of such important programs for the benefit of the community.

EXPERIENCES BY NGOs

Many NGOs working in the field of rural development have adopted different strategies to implement programs and reach resource poor farmers in the villages. The challenges of food security, poverty alleviation are deeply embedded in the socioeconomic scenario of the rural India.

1. BAIF Development Research Foundation (BAIF)

The BAIF Development Research Foundation is a voluntary research organization in Pune (Maharashtra State), India. It is working in the field of rural development and technology transfer to rural areas. It has followed unique extension strategies which could be shared for larger interest of the NGOs. BAIF's "mission is to create opportunities of gainful self-employment for the rural families, especially disadvantaged sections, ensuring sustainable livelihood, enriched environment, improved quality of life and good human values".

2. Approach

The BAIF's approach envisages people centered program implementation, interventions to improve productivity and institutionalizing mechanism to ensure sustainability of the program. Outcomes of the interventions ensure food security to participant families, which is the primary requirement. This is achieved through effective extension through convergence of other sectors and developing strong external linkages for the community.

3. Strategy of Implementation

- Need based program – family focus
- Participatory community involvement – People's Organizations
- Integrated approach – Agriculture, livestock, health, etc.
- Doorstep technology transfer
- Training and demonstration
- Special extension efforts and performance monitoring
- Linkage with rural institutes, Panchayat Raj and development agencies
- Using local resources – Knowledge and skills
- People centered approach to development- involving community in program management

- Emphasis on targeting the underprivileged section of society including women
- Developing resource teams involving participants for dissemination of learnings

The BAIF has gained experience in facilitating the development of grassroots people's organizations and implementing development programs through them. The BAIF believes that in order to ensure successful adoption of any technology, it needs to be socially acceptable, economically viable and user friendly. In the field programs, various interventions have demonstrated potential and are being widely accepted by the community. The BAIF with its associate state societies in Gujrat and Madhya Pradesh has been working on integrated natural resource development (watershed development) approach to address productivity issues in agriculture and livestock.

4. Program Coverage

The BAIF is implementing multi-disciplinary program in livestock development, water resources management, tree based farming systems, community health and empowerment of women in 15,000 villages spread in eight States of India. This program has helped at least 0.7–0.8 million families to earn sustainable livelihood. Focusing on economically backward families to alleviate poverty, the BAIF has blended research, development and training for gainful self-employment.

The dairy development program has reached over 1.0 million families through 965 centers by using state-of-the-art technologies in breeding such as high quality germplasm of exotic and indigenous breeds, artificial insemination. The technological interventions and effective extension have resulted in an increase of 1.65 million tons of milk worth Rs.1400/- crores (Rs. 14 Billion) every year in the rural areas.

5. Participatory Integrated Watershed

Water resource development presently being implemented in 27 districts in 6 states covering about 1,29 000 ha area spread over 264 micro watersheds. Over 500 people's organizations are functional in watershed areas. Through tribal rehabilitation program, over 16000 families are able to increase net annual income of the families by 35-45%. The program has resulted in: 50% increase in crop yields, extension of area under second crops by about 30%, over 6000 families using energy saving devices and income generation through agro-based small-scale activities. Almost all villages are ensured of drinking water. Sustainability is being ensured through empowering people's organizations.

6. BAIF Concept of Field Guides

The concept of field guides and bare-foot accounts/health and field workers is being implemented through training youngsters from the village who show inclination for development work. The workers take initiatives in the technical and organizational matters and develop their skills in managing village organizations. Besides incentives given to them, they receive remuneration from village organizations and serve good link between farmers and the organization. Sustainability of field programs is ensured through such efforts.

7. Experience of other NGOs

In the adaptive end of the R&D spectrum, PRADAN has successfully scaled down technologies developed at public institutes for mushroom and raw silk production. In the case of leather processing, besides adoption of technology, it has also devised integrated schemes of credit and marketing. (Vasimalai 1991)

SUGGESTIONS FOR ENHANCING AES SYSTEM

- Present extension system operates to benefit selected segments of the community. *Resource poor farmers* are neglected in the process of technology dissemination. The system should reach the poorest of the poor small and marginal farmers to address their needs. Extension inputs based on need assessment should be able to increase technology acceptance by the farmers.
- Approach of technology transfer which is *top down* can be redefined in terms of involving target groups in identifying needs and coordinating linkage for multidimensional agricultural knowledge. Agricultural development should reverse the process of planning with *bottom up approach*. On need identification, by farmer's organizations, demonstrations, input distribution can be taken up.
- *Community involvement* in the program has a bearing on sustainability and therefore interventions to develop attitudinal change in community to show ownership for the work is necessary through their gradual involvement in implementation and monitoring and evaluation of extension programs. The approach should help in capacity building of the community, especially neglected segments and women.

- *Farmers' Organizations (FOs)* - users groups, women's associations are effective institutional devices in creation of client driven agricultural research and extension system. Extension can play an important role as a catalyst in facilitating farmer's organizations. The groups can become an important mechanism in articulating specific research and extension needs, technology dissemination and developing technical and managerial skills and knowledge of farmers.
- Identifying extension volunteers from villages who could be provided with training on periodic basis in appropriate technical skills, technology and communication methods. They could serve as a *link* between extension department and farmers organizations.
- Community Organizations (COs) and common interest groups are important at the village level to share responsibilities of extension of learnings through group meetings, exposure visits, field days and organizing special trainings for group members.

REFERENCES

Shantanu Kumar and Uma Sen (2003), *Agricultural Extension For Rural Development*: Issues and Challenges - 2003

Agricultural Extension and Research in India – Operation Evaluation Department-(1991) *Agri services-Extension Approaches Agri services-Training and Visit Agricultural Extension*.

BAIF (1998): *Integrated Rural Development for Sustainable Livelihood* –BAIF Development Research Foundation, Pune- August 1998.

MANAGE (1999): *Pilot Projects On Farmers Participatory Research And Extension Systems In Irrigated Areas And Rain-Fed Farming Situations*. - Farmer's participation in agricultural research and extension systems – National Institute of Agricultural Extension, Management (MANAGE), Hyderabad 1999.

Vasimalai. M (1991). *Livelihood Promotion Technology For The Rural Poor*. The case of PRADAN. Paper presented at the Asian Regional Workshop. NGOs Natural Resources Management and linkage with the public sector. NIRD, Hyderabad, India.

India- 2002: R*eference Manual* – compiled and edited by research, reference and training division, Ministry of Information and Broadcasting, Govt. of India: 404-405

4. INDONESIA

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INTRODUCTION

Agriculture Extension has existed in Indonesia since its birth in 1901, for about 93 years. The Department Agriculture Extension (landbouw voorlichtings Dienst - Dutch Language), DAE, has experienced growths in each period of political system, depicting a pattern of activity of agriculture extension, which can be grouped as follows:

1. Period of Colonization

a. Since the development of the Great Garden of Bogor in 1817 until year 1901 "etiesche" politics, idea was spread by Regional Leader, technician (extension) as adviser for governmental agencies, and extension function was done by non extension agent
b. Until the colonization of Japanese command in 1942, the role of extension agent was primarily in socializing irrigation management, transmigration and education for society of farmer and other village citizens.
c. The period of colonization of Japan was lasted from 1942 to 1945. Extension conducted by people mobilized to execute the farm management to draw up the food-stuff reserve for war period. Extension was not really conducted, but only pushed for executing the farm management to fulfill the food reserves (Darham, 2001).

2. Post Independence Period

a. Extension was reorganized in the development sector during 1945-50. Extension was / conducted by local agents, but the atmosphere was not very conducive due to physical revolution.
b. In the year 1950-60, the agricultural extension system was again reorganized on an education pattern with the "oil drop" method. This was one of the major efforts aimed at increasing agricultural production. The extension agents were canvassing about agricultural technologies among farmers. The extension activity at that time was in the form of discussions in the evening followed by meetings in the village hall on a weekly basis. The major efforts were aimed at improving land - ground processing, seed technology improvement, irrigation, eradication of pest and crop disease and improving overall crop yields.
c. During year 1960-70, agricultural extension was organized on the "Commando Pattern". The system of oil drop was replaced by "system command" forcing the farmers to use fertilizers and new variety of seeds and the package of practices, particularly in the paddy crop, forcibly. The system had its own drawbacks and did not achieve the desired goals. On the other hand, in the year 1963 the experiences of IPB (Institute of Agriculture, Bogor) demonstrated through its pilot project the success of delivering agricultural extension purely through education and technological excellence, without following any coercive means. With the demonstration method, the yield reached desired levels much over the average yield at national level and the farmers were convinced about the use of new technology.
d. During 1997-99, the goals of agriculture development in general and agricultural extension in particular were redefined to achieve self-sufficiency in food, particularly, rice. With the introduction of Training and Visit system (LAKU in "Indonesian Language"), the focus of agricultural extension was on contact farming method and educational tools like discussion with subject matter specialists (SMSs) and farmers on regular basis were held at the village level. The print media and radio were also used to reach farmers. The pattern of agricultural extension continued to be top down (Directorate General of Agriculture of Food Crop, Directorate of Extension pf Food Crop, 1986).
e. Since 1999 – now: This is the period of transition of agricultural extension from training and visit system to decentralization with restructuring of extension institutes in the area (province / regency / city) as according to the needs of farmers. This was in accordance with Code/ Law No. 22 of Year

1999 about Governance of Area and Code / Law No. 25 of 1999 about Monetary Counter balance Centre Area. Each and every autonomous area had its own authority to arrange its governance and organization including extension institute in the area and also to maintain and strengthen the extension institute on its own. There is no uniform agricultural extension pattern such as those, which were practiced during the centralized era.

Thus, the agricultural extension system has undergone a series of changes since pre independence period to its present decentralized form. Now it is moving towards demand driven and farmer responsive extension system. The system is also adopting itself to the changing situations in the world including globalization, cultural change of social arrangements, growth of science and technology, decentralization, privatization and continuous developments on every front.

PROFILE OF EXTENSION AGENTS AND EXTENSION INSTITUTIONS

There were 37332 extension personnel in Indonesia (Institution Develop Human Resource Management and Extension Agent in Sulaiman, 2001). Out of this, 30586 worked at the extension agent level. Around 70% (26008) of extension agents only had high school background (10^{th} standard), and around 8% were graduates, 0.33% (113) postgraduates and 0.12% (45) were PhDs. Thus the profile of average extension agent is high school or intermediate level. However, efforts are being made to train the in-service extension agents to upgrade their skills by extending trainings and other educational programs.

EXTENSION SYSTEM IN DECENTRALIZATION ERA

1. Background

The Indonesian Agricultural extension system has undergone transformation from top-down approach to a bottom – up approach. The role of Extension Agent has changed from that of a commando officer to counselor. The change is also visible in the working styles. The earlier practice and visit (training and visit) system is now replaced by planning and implementation of extension in participatory mode, in consultation and according to the needs of the local people.

The major aim of decentralized agricultural extension system is: (a) to facilitate the process of study of farmers and farm families to empower them to understand agri-business; (b) giving recommendations and provide access to information and resources to farmers and their families for solving their problems; (c) assisting them to create appropriate research – extension – farmer linkages; (d) developing farmer's organization and making them strong and self-sustaining; (e) providing appropriate media and ICT infrastructure to provide up-to-date training to farmers and farm families.

2. Target (Objectives)

The main target of agricultural extension system is to improve the incomes and prosperity of the farming community through improved efficiency of agriculture, enhanced productivity and information empowerment of farmers so that they can make optimum use of agribusiness opportunities.

3. System and Strategy

1) System of Agricultural Extension in Decentralization Era

There are 6 major components of Agricultural Extension system, serving the farming community, these are:

a) Agricultural Extension System,
b) Agricultural Research System,
c) Agricultural Extension Education System,
d) Education and Training Institutes,
e) Agribusiness Institutes, and
f) System of Farmers Organizations.

a) *Agricultural Extension System*: The main stream agricultural system is the key development in initiative and this sub-system has major elements of 1) Organizing Agricultural Extension at agency, town and sub-district level; 2) Extension Agent at implementation level to carry out extension work to: i) facilitate the process of farmers study; ii) identify and record the information required by the farmer and ensure its supply from research side; and iii) develop farmers organizations to become socioeconomic organizations.
b) *Agricultural Research System*: The agricultural research system consists of: 1) Government owned research institutes; 2) Private Sector owned research institutes; 3) Research at farmer's streets and 4)

The research scholars working in all the above systems. The main objectives of the research system are: i) to identify, test and propagate high yielding technologies; and ii) to conduct feedback concerning these technologies and feed it to the research system.

c) *Agricultural Extension Education System*: The education sub-system consists of: 1) School and higher education in agriculture, 2) College in public and private sector, and 3) Teachers and lecturers. The objectives of this sub-system are: a) to carry out Agricultural Education for farmers and extension agents, and b) to act as a center for knowledge and information for systematical development of agricultural and agribusiness in the area.

d) *Education and Training system*: the Education and Training sub-system consists of: 1) The Education and Training Institutes and Government's agribusiness sector including private sector, and 2) Agricultural clinic instructors. The objectives of this sub-system are: a) to carry out education and training for farmers and extension agents, and b) to act as a center for knowledge and skill for development of agricultural and agribusiness centers in the area.

e) *Agribusiness Institutes*: The Agribusiness institutes sub-system consists of: 1) Institute for yield maximization, 2) Institute of agricultural produce, 3) Marketing institutes, 4) Institute for agricultural service providers, and 5) Agribusiness actors. The major objectives of this sub-system are: a) to provide the information on yield maximization, agro-product specification, agro-processing, marketing and services, b) to guarantee the availability of inputs to the farming community, and c) to promote the packaging and marketing of agricultural produce of the farming community in the area.

f) *System of Farmers' Organizations*: Farmers' organizations sub-system consists of: 1) self-supporting system of education and training for farmers, 2) farmers' association, and 3) organizational manager and chief of the farmers, along with all the farmers. The objectives of this sub-system are: a) to carry out education and training of farmers, b) to promote the concept of farmer's solidarity and fraternity, and c) to advocate and struggle for farmers' rights.

As indicated above, all the sub-systems have functional linkage with each other and work in close coordination and mutual interdependence with one another.

MANAGEMENT OF AGRICULTURAL EXTENSION SYSTEM IN INDONESIA

1. The Roles and Responsibilities (Authority), at Various Levels

a) ***Authority of Central Government***: The Central Government has the over all responsibility for: 1) defining the Agricultural Extension Policy at national level; 2) formulating principles, norms and regulatory framework for agricultural extension; 3) formulating minimum standards and accredit the institute, medium, infrastructure and budgetary provision for agricultural extension, and 4) developing cooperation in the area of agricultural extension within the country and abroad.

b) ***Authority of Province Government***: The provincial government is responsible for management of education and training and development of human resources at various levels and also for providing vocational education and training skills to senior, middle level officials in the area of agricultural extension. Based on this responsibility, the major role of provincial government is to carry out education and training of extension functionaries which includes extension agents in the respective province.

c) ***Authority of Regency***: The regency is the real level of planning and execution of agricultural extension programs and hence has major responsibilities in providing agricultural extension services to the farmers. The major roles and responsibilities at the regency level are: 1) to develop policy and program for management of agricultural extension at regency level; 2) to develop extension material in terms of sending messages and also audio, video material for electronic media according to requirements; 3) to provide training and education support for farmers groups; 4) to provide coordination and ensure cooperation among farming community, extension agents and researchers; 5) to provide training and education to extension agents on a regular basis; 6) to provide adequate management support to agricultural extension institutes; 7) to provide logistical and technical support to farmers including women and young farmers; 8) management of agricultural library; and 9) to provide overall development of agricultural extension in the regency.

2. Planning

The planning of agricultural extension programs is highly participatory and bottom up in Indonesia. The principles of democracy, participation, transparency, decentralization and autonomy at grassroots level are taken into account to the maximum extent. The planning process also takes cognizance of available

resources, human capital, technology available and other issues prevailing at the farm level while planning the agricultural extension programs. The basic mechanism for bottom up planning followed is as follows:

a) ***Planning at Village Level***: The planning activity at the village level is done with problem identification and need assessment at farmer and agribusiness society level by using participatory planning instruments (Participatory Rural Appraisal "PRA"), thereafter pursuant to this PRA a Plan of Group Effort (RUK, in Indonesian language) is developed which is then translated into The Group Activity (RKK, and thereafter in The Village Activity (RKD) and further into Activity of Agricultural Extension personnel in the village(RKPPD).
b) ***Planning at the Sub-District Level***: "after RKPPD is prepared, the group of extension agents at the sub-district level convenes a meeting to consolidate and compel a program of agricultural counseling (BPP), at the sub-district level. This program basically represents the annual agricultural extension plan (collected from different villages and compiled at the sub district level) pursuing for specific requirements of local society in terms of activity, volume, target, goals, issues, problems, and a way to resolve problems including detailed methods.
c) ***Planning at the Regency Level***: At the regency level, Programme of Extension of Regency Agriculture is compiled considering annual agricultural extension plans of the whole regency. This program compilation is done by various groups of extension agents in consultation with agricultural extension institutes and also Commission of Extension Regency Agriculture on an annual basis.
d) ***Planning at the Province Level***: The annual action plans of agricultural extension at the province level are compiled by loading all the regency plans and also by considering all the resources available to facilitate the activities of agricultural extension in he province. The compilation of program is first done by the groups of farmers and fishermen (KPNA Groups), and also other farmers' organizations and extension agents.
e) ***Planning at the Central Level***: The responsibility of preparing a strategic plan for agricultural extension is with the central government. The Central Government prepares a plan of development for agricultural extension every 5 years and then also develops annual plans having specific provision for institutional aspects, management aspects, and budgetary allocation. This compilation/strategic planning is conducted by body of development of resources of human being agriculture, group of KPNA and other farmers' organizations in consultation with the Commission of Extension of National Agriculture.

3. Agricultural Extension Policy Planning and Management Structure

a) ***Institutional Arrangement at the Central Level***: The key agency responsible to decide agricultural extension policy at the central level is "Body of Development of Resources of Human Being Agriculture, Department of Agriculture". A national level "Commission of Extension of National Agriculture" supports this policy level body. The commission has functioned to prepare the technical materials and proposals for formulation of national agricultural extension plan. The commission also advises the Body of Development of Resources of Human Being Agriculture, Departmental of Agriculture on issues of execution strategy for extension programs. The membership of the Commission of Extension of National Agriculture consists of 60% from NGOs and 40% from governmental officials.
b) ***Institutional Arrangement at the Province Level***: The policy level body for Agricultural Extension at the province level is "Hall of Education and Training Agriculture/Agribusiness", which is an advisory body to the governor. In executing its body and functions in the area of Agricultural Extension, the Hall of Education and Training Agriculture/Agribusiness is assisted by a "Commission of Extension of Agriculture Province". The Commission of Extension of Agriculture Province has the responsibility of the proposals for formulating the policies and programs on agricultural extension for the province which also includes management issues related to education and training of technical manpower in agricultural extension and also vocational and educational training requirements at the middle level and junior level officials. The Membership of Commission of Extension of Agriculture Province consists of 60% from NGOs and 40% governmental officials.
c) ***Institute at Regency/City Level***: The institution for Agricultural Extension / counseling at Regency/City level is the "Organizer of Agricultural Extension/Hall of Agricultural Extension", which reports to the Mayor of the Regency/City for executing its duty and functions. The Organizer of Agricultural Extension is assisted by a "Commission of Extension of Regency/City Agriculture". The Commission of Extension of Regency/City Agriculture has the function of preparing extension plans and policies at the Regency level and also advise the organizer on agricultural extension and internal

issues for executing agricultural extension programs in the area. The Membership of Commission of Extension of Regency/City Agriculture consists of 60% NGOs and 40% governmental officials.

d) ***Institute at Sub-district Level***: The decision making body in the area of Agricultural Extension at sub-district level is "All of Agricultural Extension/BPP". The Hall Agricultural Extension in sub-district prepares the work plans and activity schedule under the overall guidance of the concerned Regency/ City Agricultural Extension Plan. The major responsibilities of BPP at the Institute of Agricultural Extension at the sub-district level include: a) facilitating compilation of management programs and a plan of action for Agricultural Extension agents; b) facilitating the availability and propagation of technical information and market information to the extension agents and farmers groups; c) ensuring coordination among researchers, extension agents, farmers groups and other stakeholders in agriculture/agribusiness; d) facilitating regular interaction among the agricultural extension agents and farmers at all levels, and e) facilitating setting up of central development models through farmers efforts and organize its demonstration to farming community nearby, in coordination with agribusiness stakeholders.

e) ***Institute at the Village Level***: The key Policymaking body, as well as the executing partner in Extension activities at village level are the Groups of Farmers. The Groups of Farmers execute the activity of agriculture extension as parallel job partners of Agricultural Extension Agents. Relation among institution of agriculture extension, the Center, the Province and the Regency/city is a functional relation, while the relation of institutions of Extension at Regency agriculture/city with BPP/institute of extension at Sub-district agriculture is more in the nature of operational relation. The relations among Commission of Extension of National Agriculture, Commission of Extension of Agriculture Province and Commission of Extension of Regency Agriculture / town is also a functional relation. The relation among various Agriculture Extension Institutions is enclosed at Annexure I.

4. Technical Manpower in Agricultural Extension

The technical manpower in agricultural extension in Indonesia is organized at various levels, as follows:

a) ***Manpower at the Central Level***: Extension at the expert level, There are experts from various areas like communications, agribusiness of food crops, agribusiness of horticulture crops, agribusiness of plantation crops, food resilience, experts on gender, social scientist, farm management experts and in moment experts.

b) ***Manpower in Province***: At the provincial level also there are groups of experts available in all the major areas namely; communications, agribusiness of food crops, agribusiness of horticulture crops, agribusiness of plantation crops, food resilience, experts on gender, social scientists, farm management experts and in moment experts, according to the requirement;

c) ***Manpower at the Regency Level***: At regency level, experts in the above areas and subject matter specialists on regional development and social service providers at village level;

d) ***Manpower at the Sub-district Level (DPP)***: the expert extension agent at the sub district level has skills in the area of agricultural communication, agronomy, agribusiness of food crops, horticulture, plantation, ranch, training management, gender, organization development of farmer, social development of village besides thorough knowledge of land, water and in movement management;

e) ***Manpower at the Society Level***: The extension agent of agriculture is based at village level, and is normally from a farmer family and is responsible for assisting farmer and people involved in agribusiness. He also coordinates the services of NGOs and other people involved in the development agriculture at the village level.

5. The Key Principles of Implementation of Agricultural Extension Programs in Decentralization Era

In the decentralization era, the *principle of autonomy* gives the authority to plan, privatize and implement agricultural extension progress in the agricultural extension systems at the autonomous area level, i.e. regency or city under the broad framework of Totalitarian State Republic of Indonesia. The agricultural extension system manages itself according to the conditions and local resources and the wisdom of management at the society level. The *principle of equality* in partnership provides the base for agricultural extension system to be carried out by virtue of equivalent domes among extension agent's counselors of agriculture, farmers and their families and agribusiness society. The *principle of democracy* demands that agricultural extension system has to accommodate various opinions and needs and has to meet the aspirations of all parties/ stakeholders. The principle of openness ensures that all stakeholders

have equal access to the agricultural information and is also helpful to build trust among the partners. The *principles of self-sustainability* en-joins the responsibility to provide support in the form of man power, funds and also requires for extension work by the farmers organizations and agribusiness partners. *The principle of accountability* makes the management at regency level more responsible to the farmers and farm families and so also to the agribusiness community. *The principle of integration* is used to constitute multi-agency groups to ensure proper coordination and synergy to achieve goals of agricultural development in the area.

The basic responsibility of agricultural extension management is guided by "Plan of Strategy of Agricultural Extension, which is developed at the national level and sets broad principles to facilitate the local governments of Province and Regency/City, so that they can carry out the agricultural extension activities efficiently and effectively. The management of agricultural extension at Province level is carried out in pursuance with Program of Extension of Province Agriculture, considering the resources available in the area.

The management and execution of Agricultural Extension Programs at Regency/City level is carried out in accordance with the "Program of Extension of Regency Agriculture/City, and is facilitated by agricultural extension in BPP/Sub districts. The extension management in BPP/Sub districts is carried out under the guidance of the "Program of Agricultural Extension of BPP/Sub district and is implemented through Plan of Activity Extension Agents/Counselors of Agriculture, who facilitate the process of transferring the technology to farmers and participating agribusiness personnel.

The Management and Extension of Agricultural Extension Programs at village Level is carried out by following the Program of Extension Village Agriculture (integrated RKPPD) under overall framework of program of extension of Agriculture BPP / Sub district.

6. Defrayal (Budgetary Provisions)

At the central level, the Central Government provides expenses for the development of institution, manpower, program and management/execution and also cooperation of agriculture extension. The Central Government also supports the activities of guidance, norm setting, regulation and the education and training of farmers and their leadership, which have importance at the national level. The Central Government also provides for allocation of special funds in the form of de-concentration fund to the Provincial Governments, and also funds are allotted as aid which can be directly routed to Regency Government/city, in case of natural disasters and for expenditure (APBN), overseas aid and cooperation with the corporate world.

At the Province level the execution of agriculture extension is defrayed from the budget provided by the Government of Province, the allocation of Central Government and cooperation with the corporate world. This expense is used to: (1) educate and train the extension worker to create interest, (2) facilitate the cooperation and development of information network, and (3) facilitate the development and efficient working of the forum of farmer meeting/Farmers' organizations.

At regency/town level; the execution of agricultural extension is defrayed from the budget provided by Regency Government/city, Government of Province, Central Government and cooperation with the corporate world. This expense is used to: (1) meet the operating expenses of agricultural extension, (2) ensure availability of technical material and infrastructure of agricultural extension, (3) ensure proper training of extension agents, and (4) other miscellaneous costs according to the requirement of local needs.

7. Monitoring and Evaluation

Monitoring basically is the activity of monitoring and observing the process, activity, result and effect of a certain activity. Monitoring is done in order to: (1) know whether input, schedule of execution and output planned are running according to the plan, (2) getting data of input use, activity and result of, and (3) avoid deviations from the expected result and target. Monitoring and Evaluation of agriculture extension is carried out at various administration levels (Center, Province and Regency/city), as according to the authority arranged in UU No. 22 Year 1999 and PP No. 25 Year 2000. This is primarily done to guarantee the public about the accountability transparency; for all stakeholders of agriculture extension (farmer, worker, and perpetrator agribusiness). Monitoring activity is conducted right from the start (starting of plan preparation) till the finish (completing the village level activity).

CONCLUSION

The Agricultural Extension system of Indonesia is in a transition period as it is becoming more and more participatory, from its original top-down approach, according to the condition of each region/regency area (principle of area autonomy). The Training and Visit system is being replaced by people's programs or

Farmers' Organizations driven initiatives and Extension Agents are becoming more responsive to local needs. The methods/equipments used are becoming more and more participatory.

Although the decentralization era in Indonesia is promoting the concept of area autonomy (regional of regency), the Extension System is managed and run by autonomous area, where institute of extension of agriculture and extension agent work closely with farmers' organizations and the key players of agribusiness society cater to the needs of farmers and fisherman at all stages of agricultural operations.

Therefore, the status and structure of the institute of agriculture extension can differ from one area to the other according to the requirement and the area, ability, and the elementary function of agriculture extension ought to be equal (Slamet, 2001). If elementary function of extension has to run well, Indonesian government, in this case Department of Agriculture of Republic Of Indonesia has re-oriented the system of agriculture extension, which is adapted by spirit epoch, where the extension system has accommodated the principle of participation to empower the farmer.

REFERENCES

Anonim, (1986) Vademakum : *Penyuluhan Pertanian Tanaman pangan*; Direktorat Jenderal Pertanian Tanaman Pangan, Direktorat penyuluhan Tanaman Pangan : Jakarta.

Darham, Sjachriel, (2001): *Penyuluhan Pembangunan Di Kalimantan Selatan*, Makalah yang disajikan pada seminar PERHIPTANI, Pada Tanggal 21 Oktober 2001 : di Tasik Malaya.

Departemen Pertanian Republik Indonesia, (2003): *Sistem Penyuluhan*, http://www.deptan.go.id/pusbangluh/suluhtan.htm.

Munandar, Sinis, (2000): *Prinsip, Arah dan Kebijakan Program Penyuluhan Pertanian* : Bogor.

Slamet, Margono, (2001): *Paradigma Baru Penyuluhan Pertanian di Era Otonomi Daerah*; Makalah yang disajikan pada seminar PERHIPTANI, Pada Tanggal 21 Oktober 2001 : di Tasik Malaya.

Sulaiman, Fawzia, (2001): *Faktor-Faktor Dan Isu Yang Mempengaruhi Revitalisasi Penyluhan Pertanian : Bogor.*

Annexure I

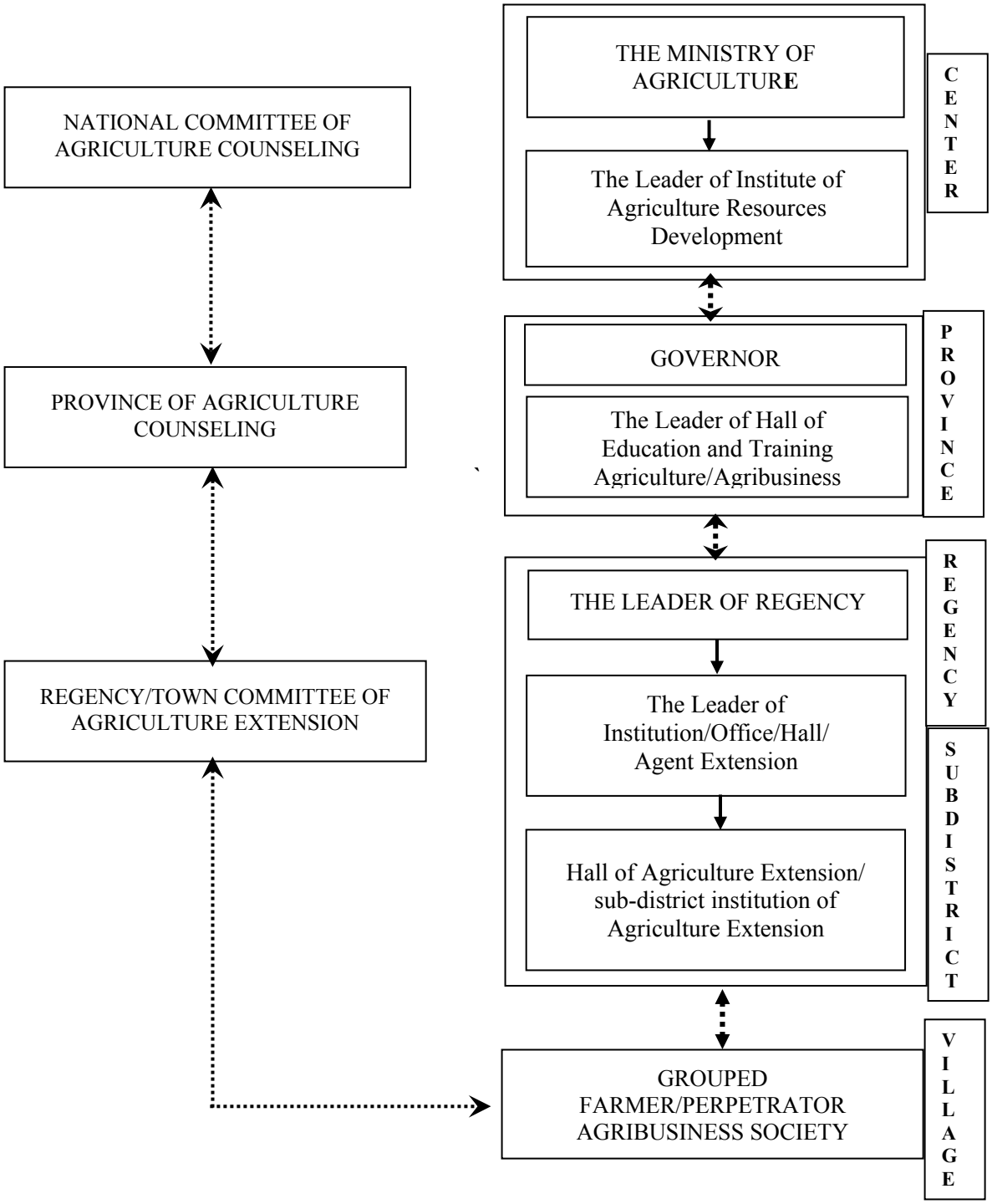

Figure 1. Structure and Institution Relationship Agriculture Extension

Annexure II

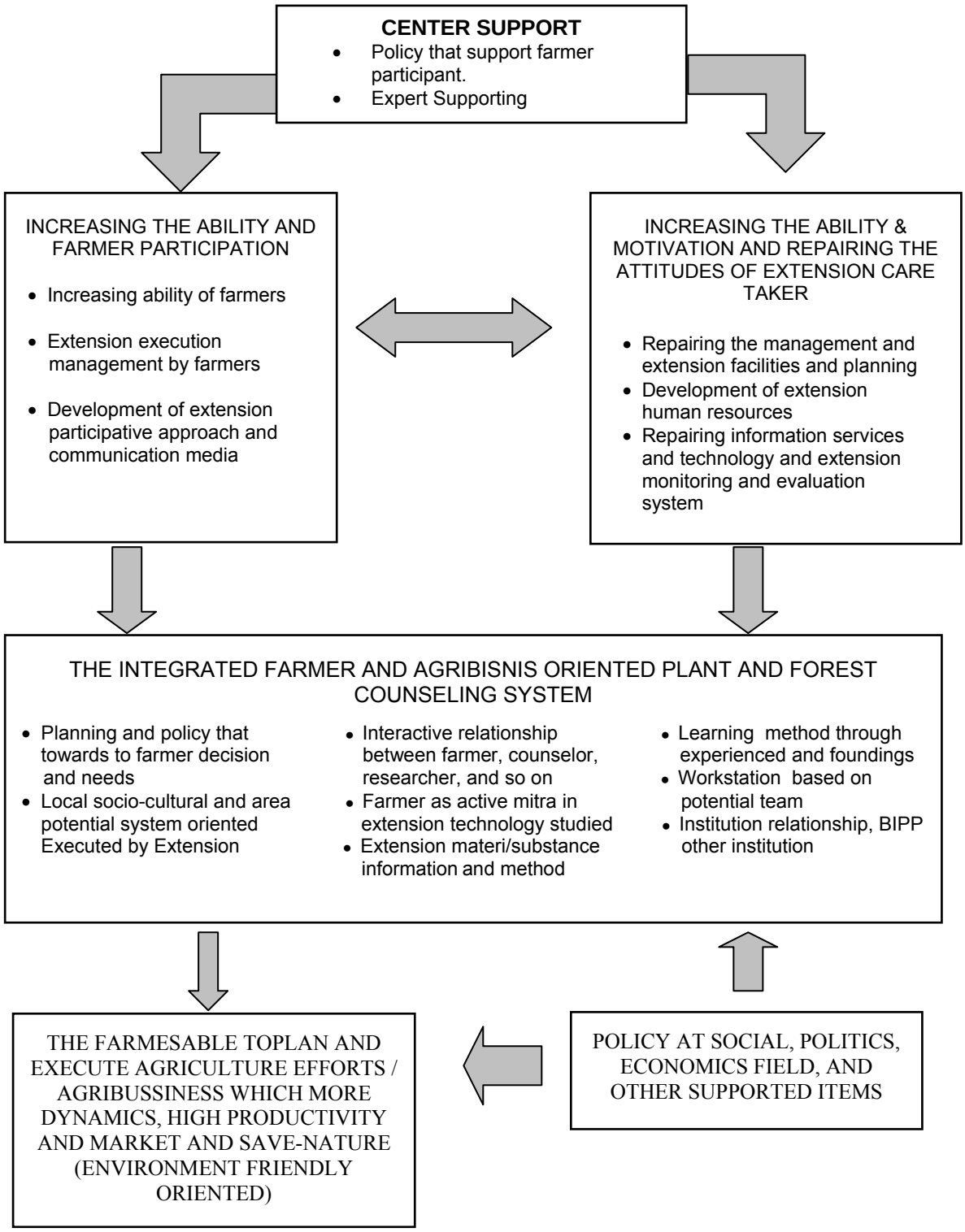

Figure 2. Framework of Agriculture Extension Department at Regency in Indonesia at Decentralization Era

5. ISLAMIC REPUBLIC OF IRAN

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INTRODUCTION

An effective extension system needs to develop the capability to change in relation to its environment and has to cope with changes within and outside the system. Hence, extension system should reorient its strategies to meet the emerging needs and requirements of farmers. Keeping in mind the current knowledge revolution in agriculture, extension should obtain the capacity to play a major role in the management of agricultural knowledge and information system. Since extension system can play a decisive role in improving farm productivity, its enhancing is of paramount importance for agricultural development in Iran.

1. Geography

With an area of more than 1648 thousand sq.kms, Iran is situated in southwest Asia, and is considered as one of the Middle East countries. Iran is a mountainous country with a variety of climates. The average temperature and rainfall for the whole country are 18°C and 240 mm, respectively (CAPES, 1996). The country is organized into 28 provinces.

2. Population

Over the past two decades, the rapid rate of population growth has been a major source of concern in Islamic Republic of Iran. The population of the country passed 60 million in 1993 and is projected to reach 86 million by the year 2010. According to the 1991 census, the female population of 15 years and above was 15 million (Anonymous, 1998). However, thanks to considerable investments and well-organized and directed national population planning program, the population growth rate is now 1.5 percent in the urban and 2 percent in rural areas. At the national level, the figure is 1.65 percent (CAPES, 1996).

STATUS OF AGRICULTURE

Agriculture is an important component of the Iranian economy, contributing 27 percent of GDP, 23.8 percent of employment opportunities, 82 percent of food supply and 35 percent of non-oil exports. It provides considerable portion of the raw materials for industrial use (CAPES, 1996). The principal cash crops are fresh and dried fruits. The main subsistence crops are wheat, barley, sugar beet and sugarcane. Mutton, lamb, fattening cattle and dairy cattle, poultry and fishery products are also important for domestic food supply (World Bank, 1994). Meanwhile, in food security terms, the Iranian government strongly supports agricultural development, increased food production, rural development and self-sufficiency in strategic food security. Thus, as far as the objectives of food production are concerned, the requirements are: access to land, better incentives to farmers, easy and affordable access to production inputs, improved knowledge and enhanced participation (CAPES, 1996).

However, food security for the citizens is a constitutional principle to which the entire country is committed. In the constitution, strong emphasis is given to some of the key preconditions for national food security such as agricultural development, science and technology, environment protection, social security, poverty alleviation, protection of women's rights and human dignity. Hence, agriculture and rural development are two pivotal issues in the national development programs in Iran. (Shabanali Fami, 2000).

Smallholders constitute the dominant section of rural people involved in agriculture. They are referred to, as "the family farm sector" comprising almost 50 percent of the rural population. Hence, this sector is central to concerns about poverty alleviation, production increase and food security. As noted by Pertev and King (2000) small-scale agricultural development is central to the elimination of poverty and hunger in developing countries.

Contrary to the myth that agricultural extension is a tool to alleviate rural poverty, the findings of field research indicated that the extension organization was concentrating its efforts in villages where farms are larger, the village is more developed and which are nearer to the Rural Services Centers (Karami, 1995). This study also revealed that while the concepts of sustainable development go far enough to emphasize between–generation equity, the current extension efforts in Iran are increasing the inequity between villages. A nation wide study (Karami, 2000) indicated that the considerable percent of farming systems was unsustainable. Agricultural extension services by promoting conventional agricultural technologies are further reducing the sustainability of the farming systems. A path analysis of different factors with degradation of environment (Rezaei Moghaddam, 1998) indicated that in general, there is a negative relationship between poverty and sustainability. Furthermore, the study indicated that extension is neither contributing to poverty alleviation nor to sustainability of agriculture. Therefore, reorganization of extension system is an important priority in Iran.

HISTORY OF AGRICULTURAL EXTENSION

Many years ago, when agricultural sciences were introduced in Iran, the newly educated agricultural engineers tried to transmit their knowledge and skills to farmers who had learnt farming from their fathers and grandfathers. They thought this would be easy. These farmers, however, didn't allow new technologies to come into their farms. They believed that the power of their own hands was more than the words of young engineers with books. This new generation planned a better future for the farmers, in which machines would replace manpower and cowpower, a world with more crops per drop. But an actual relationship between farmers and scientists did not exist until a group of agricultural engineers communicated with ethnic farmers in a relationship of equity and equality, by having them participate in creating special connections between different kinds of knowledge. This group was called agricultural extension engineers (Rahimi, 2000). However, initial work extension took place in 1949. At that time, the government contributed considerably to the formal establishment of public extension sector. Assistance was also provided by US government (Malek Mohammadi, 1998).

1. National Extension System

Extension services in Iran have sought to develop competence of farmers so that they may have better control over their farming systems. The approach of extension system towards agricultural development is to help and empower farmers to discuss, recognize and define their needs and encourage them to involve in diverse programs to satisfy their needs. The extension system is in operation in all parts of the country encompassing about 52000 villages having 23 million people. It has five major levels of administration, i.e., national, provincial, township, district and Dehestan levels.

The country envisions a broad-based and holistic extension system in content and scope. The prevailing approach is participatory extension, in which greater emphasis is given to working with farmers (Groups). During the past five decades, Ministries of Agriculture and Jihad (now Ministry of Jihad-e-Agriculture) were responsible to provide rural people with the extension services.

2. Structural Adjustment and Evolution in the Extension System

During the past six decades, the extension system in Iran has undergone some changes which are briefly pointed out. The Ministry of Agriculture in Iran was established in 1941 for various reasons, including policies adopted by central government caused it to experience many changes in terms of organizational structure and duties until the culmination of the Islamic Revolution in 1979. Since 1949, the Department of Extension (DOE) has been one of the main administrative sections of the Ministry of Agriculture. However, in 2001 DOE was integrated with the Ministry of Jihad.

Shortly after the culmination of the Islamic Revolution, upon the call of Imam Khomeini, a new institution named Jihad-e-Sazandegi (Construction Jihad) came into existence. It was specifically established for rural and agricultural development purpose. In 1991 Jihad-e-Sazandegi received the position of ministerial level and as a result, it was entrusted some of the duties of the Ministry of Agriculture, including those related to livestock management, fisheries, aquaculture, and natural resources management.

After years of continuous efforts and impressive achievements, finally upon the approval of the Islamic Consultative Assembly, the new Ministry of Jihad-e- Keshavarzi (Jihad-e-Agriculture) was established by merger of both the Ministries (Ministry of Jihad-e-Sazandegi & Ministry of Agriculture) in 2001.

In the newly established ministry, Deputy of Extension and Farming System serves as the general headquarters for all agricultural extension activities in the country. The main offices of this deputy is indicated in Figure 1.

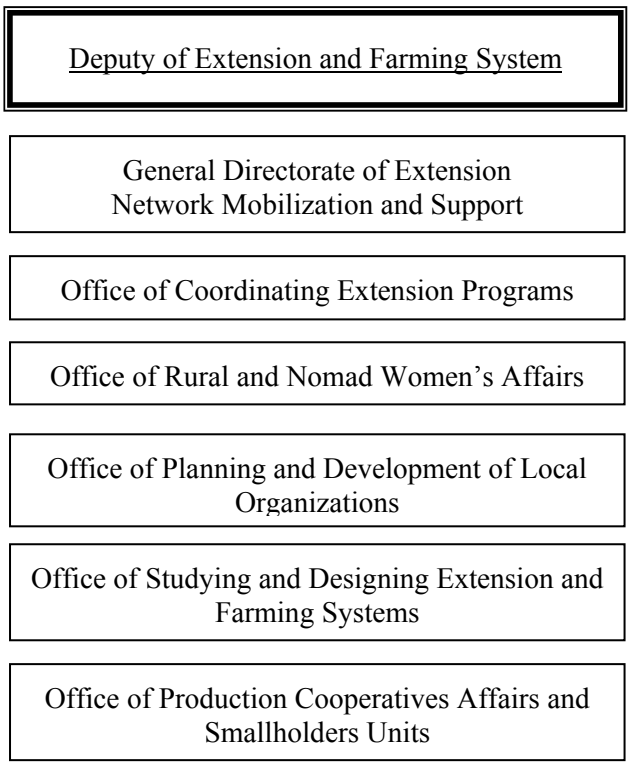

Figure 1: Agricultural Extension System in Iran

STRATEGIES TO ENHANCE EXTENSION SYSTEM IN IRAN

1. Establishing National Extension Network (NEN)

The past experience has revealed that farmers have had no appropriate access to extension centers, as the centers have been very diverse and unequally distributed across the country. To cope with this problem, the Ministry of Jihad-e-Agriculture has decided to reorganize the extension centers. Hence, Deputy of Extension and Farming Systems drafted a preliminary outline for integrating and deploying extension centers. The new setting is called: National Extension Network (NEN) which consists of physical and human elements for facilitating the process of disseminating technical knowledge in agriculture to farmers. The purpose of NEN is to assist farmers to meet their information needs very fast and at the lowest cost through integration of structures and functions of extension centers, which would hopefully enhance the productivity of the extension system. The NEN is also going to support the entire manpower deployed for extension works at the grassroots level According to the NEN plan, one extension center will be established for each of the Dehestan, where the farmers can obtain information, extension and supportive services on their farm problems. NEN is to achieve the following objectives:

1) Facilitating the process of extension services delivery;
2) Enhancing the standards of extension centers in terms of space and equipment;
3) Improving rural participation in the administration of extension centers; and
4) Enhancing farmers' access to agricultural support services.

In NEN, there would be on an average 10 extension workers per one SME, 20 extension workers per one technical or logistic workforce and 30 extension workers per one extension officer or director. (GDENMS, 2003a). The NEN project has been designed and is implemented by the ***General Directorate of Extension Network Mobilization and Support (GDENMS)***. Policies of the GDENMS are as follows:

1) Improving the relationships among extension centers reorganized on the basis of a hierarchical pattern;
2) Making balance between physical and human resources using scientific standards and patterns;
3) Designing and establishing an agricultural knowledge and information system considering the actual needs of farmers;
4) Providing the conditions to other organizational units of the Ministry to bring benefits from extension network;
5) Supporting the extension activities of the private sector through extension network capacities;
6) Improving the productivity of physical resources of extension centers;

7) Establishing a national information network in the extension system of the country;
8) Organizing local and volunteer manpower to perform extension activities;
9) Developing and strengthening local organizations;
10) Strengthening the operation levels of extension activities in rural areas; and
11) Making use of indigenous knowledge and practical experience of farmers in projects and program formulation. (GDENMS, 2003a).

2. Extension Centers (ECs)

During the past three decades, various extension centers have been established in rural areas. Educating rural people, supporting agricultural development programs and delivering necessary services to the farming communities are the main functions of these centers. However, some of them have been more involved in the distribution of basic agricultural inputs than with the provision of extension services. Extension Centres are known with different names:

Rural Services Centers (RSCs): RSCs initiated their activities in 1980, under the management of Ministry of Agriculture. They were established at the district level to provide farmers with the technical, financial, educational and infrastructure services such as seeds and fertilizers distribution tasks. Each RSC consists of different units like water and soil, poultry and livestock, agronomy, mechanization and extension education unit. An average 48 villages are covered by one RSC. They have suitable access to infrastructure facilities such as potable water, electricity, and telephone but do not have appropriate access to teaching aids.

Educational Complexes (EDCs): The first EDC was established in 1998 under the management of Ministry of Jihad. The main goal of EDCs is to educate rural people working in different economic sections particularly in agriculture. EDCs are mostly located at the provincial level. About 82 per cent of EDCs have boarding and lodging facilities.

Extension Homes (EHs): EHs were first established under the management of Ministry of Jihad in 1990 at Dehestan level. Each EH covers about 22 villages. Since the outset of extension activities in the country, EHs have been the first extension centers that have merely focused their attentions on extension activities. The main goal of EHs is to improve managerial, technical and marketing abilities of farmers and enhance their income and standards of living. Local people and extension workers are under the supreme control of the government run EHs. Each EH has two educational sections: library and information database unit. About 70 per cent of EHs cover 1-2 rural libraries.

Rural Libraries (RLs): The first RL was established in 1946 with the principal goal of developing human resources in rural areas. In this regard, with the membership of rural boys and girls, RLs also render extension services now. Each RL covers 19 villages (about 341 households). The average literacy level of rural people in the areas covered by RLs' services is about 73 per cent. The average working hours of RLs is also about 4 hours per day.

Extension-Education Centers (EECs): The first EEC was set up in 1971 by the help of the National Committee for Literacy Campaign. On the average each EEC serves 76 villages. (GDENMS, 2003).

Table 1 shows the total number of different ECs established until 2002.

Table 1: Extension Centers Established till 2002.

Rural Services Centers (RSCs)	800
Educational Complexes (EDCs)	26
Extension Homes (EHs)	356
Rural Libraries (RLs)	2126
Extension-Education Centers (EECs)	190
Total	3498

3. Applying Information Technology in Extension Processes

A new revolution is sweeping the globe- Information Technology (IT). It is a vehicle for future development, opportunities, challenges and competition that enables information to be collected and used. No aspect of human life remains untouched by the impact of IT, and agriculture is no exception. (Panicker and Choudhary, 2001)

Access to information and improved communication is a crucial requirement for agricultural development. However, it is observed that rural population still has difficulty in accessing critical information in order to make timely decisions. Modern communication technologies, when applied to rural

areas can help in improving communication, increase participation, disseminate information and share knowledge and skills. Cyber extension would be the major form of technology dissemination in the near future. It uses the power of online networks, computer communications and digital interactive multimedia to facilitate dissemination of agricultural technologies. (Kannaiyan VC TNAU, 2001).

In Iran, increasing attention is being paid to apply information technology as a means of technology transfer in extension planning and implementation process. Hence, for every EC at least one computer system will be provided during the next five-year plan (2004-2009).

4. Improving the Process of Communication

In the extension system of Iran, a great emphasis is placed on the role of indigenous knowledge to facilitate communication in rural development programs. Communication between project personnel and farmers is often very poor, particularly in projects with a structure that favors literacy, top-down message flows and innovations developed elsewhere (Warren, 1976).

The extension system has been using four main channels to convey information to farmers. Those channels are radio, TV, printed materials and interpersonal communication. Radio and TV stations located in the province's centers allocate time to the extension offices to make agricultural programs and broadcast them to the farmers. The programs are made in the extension office by the extension staff. These programs try to reach rural audiences with specially tailored messages in an attractive and cost efficient format. Also, extension officers prepare publications on the related agricultural topics and present them to farmers. In addition, many extension organizations in different provinces produce periodic bulletins with news and review articles (In Farsi), which primarily aim at extension services. Extension agents also teach the farmers in interpersonal communication channel.

5. Placing Emphasis on the Participation of Farmers

Increasingly, attempts are being made to increase the participation of rural people in development activities in general and involving farmers in setting extension agendas in particular in Iran. The techniques of Farming Systems Research and Extension and Integrated Rural Development together with Farmer Participatory Research, are representatives of this new trend. All seek to achieve a closer fit between intended technical solutions and existing social frameworks. (Warren, 1988). In the extension system of Iran, it is believed that solutions on local problems are to be developed in partnership between the extension agents and the farmers. Extension mechanisms will have to be demand-driven, location-specific and address the demand for diversification. It is because the country comprises of very diverse cultures, ethnic groups and agro-ecological zones.

6. Empowerment of Rural Women

Empowerment of rural women is an important thrust area of many rural and agricultural development programs implemented by various governmental and non-governmental organizations in Iran. In Iran's rural society, every family can be counted as a production unit. These production units are small so that in the past, the kind of products that they used to produce and the amount of those products were most of the times the functions of each family's consumption and demand. In addition to meeting the domestic needs of the family, these products have found their way to the larger markets at the national and international levels. Rural women have always been an important foundation of these production units. Without the presence of rural women, the economic structure of the family could not and can not become sustainable. The participation of rural women in economic activities is an undeniable reality. Iranian rural women are active in economic activities such as agriculture and handicrafts. These activities let them play an effective role in reducing production costs and increasing family incomes, in addition to attending to their children and household. Therefore, gender concerns are mainstreamed in the agricultural extension process to ensure that women receive information relevant to their work.

About 50 per cent of Iranian women live in rural areas. Almost 100 percent of these rural women participate in agricultural activities and cottage industries. Women's share in agricultural labor is stated to be at 40 percent. This figure does not take into account their activities at the household level, including vegetable gardening, flower production, etc. which supplement the family income. In today's Iranian society, women demonstrate that they have capabilities and potential talents, which, under proper conditions can greatly contribute to national health and economic development. Hence, enhancement of women's participation in economic activities is one of the most important objectives of many governmental organizations, including Deputy of Extension and Farming System (Anonymous, 1998; Worldbank, 1994; RWDO, 1996; Tohid, 1997; ORNWA, 1999). In particular, extension system targets rural women through increased participation in decision-making, organizing them into self-help groups, building their technical competencies on skill-based technologies and their leadership abilities.

7. Training of Extension Personnel

Adequate numbers of well-trained extension personnel are the basic resources for successful extension system without which, extension will be seriously limited in its ability to plan and execute educational programs and other technology transfer activities. Regular training of extension agents is fundamental to the delivery of effective extension programs. The educational qualifications of extension agents in Iran are low in relation to the assignments and responsibilities, which they are expected to carry out. (Pezeshki-Raad et al 1994). Hence, In Iran, it is widely accepted that a substantial training effort is needed to upgrade the skills, knowledge and qualifications of extension personnel (Chizari et al, 1997; Pezeshki-Raad et al 1994).

There are about 6497 public extension functionaries in the country. Keeping in mind the emerging trend in agricultural development, the extension workers will have to be adequately trained. A massive campaign is done for skill upgradation and capacity building of extension workers mainly on the subject matter areas of PRA techniques, community mobilizing/organizing methods, development of leadership skills and conflict resolution between different interest groups.

8. Vocational and Technical Training of Rural Youth

In order to develop knowledge, skills and attitude of rural youth in agriculture, The Ministry of Jihad-e-agriculture will organize vocational and technical training courses in agriculture with the help of National Organization for Vocational and Technical Education (Ministry of work and Social affairs). (Emadi, 2003)

9. Support to Private Agricultural Extension

The financial crunches of public extension system as well as the pressure on the government to maintain the vast extension network are two main factors stimulating the emergence of private extension agencies in Iran. It is because of this belief that an effective alternative would be to delink certain services from the public sector and allow the private sector to handle those services. Hence, outsourcing strategy of privatization of extension was adopted to promote and support private sector involvement in extension provision. In fact, outsourcing is a way of involving the private sector in an agricultural system that is coordinated and regulated by the public sector. Under this approach, responsibility for extension delivery is contracted out to private extension sector.

One of the first attempts towards privatizing agricultural extension in Iran was started in Hamadan province through establishing private extension agencies. Since the year 2001, eight private extension agencies have been established in different cities of the province. Table 2 shows the extent of extension activities of these private agencies during the past two years.

Table 2. Extension Activities Carried Out by Private Sector Agencies in Iran

City	Name of agency	Districts covered	Villages covered	Educated rural people (person/day)	No of courses organized
Bahar	Baharmoravej	3	40	2140	126
Toyserkan	Sabzgostar Hegmatan	2	28	2850	29
Razan	Nowandishan	3	30	2800	33
Malayer	Imandasht	5	70	7774	47
	Hooshavaran Gharb	2	70	1200	49
Hamadan	Sabzafarin	3	45	1500	44
	Sonboleh Sam Alvand	1	15	1000	21
	Sabzandishan	6	250	NA	199

An evaluation of the performance of these private extension agencies revealed that they face some problems, which decrease their efficiency. Some of the main problems are as follows:

a) lack of access to appropriate transportation facilities and teaching aids;
b) lack of access to skillful SMS;
c) Financial dependency on the public extension system;
d) Lack of independence in policy making;
e) Lack of proper coordination between public and private extension organizations; and
f) Unfavorable attitudes towards the capacity and potential of private extension agencies among farmers and public extension personnel. (Bahrami, 2003)

However, it is a precious experience on privatizing extension activities in Iran from which many lessons are being learnt.

10. Improving the Role of Extension for Sustainable Agriculture

In Iran, sustainable agriculture is gaining popularity among various organizations in the agricultural sector (Chizari et al, 1998). Since extension workers can play an important role in sustainable agriculture, they must first understand the related concepts and gain knowledge on this issue. Therefore, one of the strategies of extension system of the country is to train extension personnel on sustainable agriculture concepts.

11. Involving Research Institutes in Extension Activities

In addition to the Deputy of Extension and Farming Systems of the Ministry of Jihad-e-Agriculture, the research institutes are also involved in extension through farm trials (demonstration farms), field demonstration and dissemination of information using printed materials

12. Enhancing the Role of Female Extension Workers in the National Extension System

There are about 6497 extension workers in the public extension system in Iran, out of which only 7 % are women which is less than the global average of 13 %. In terms of specialization, just about 12.5 % of female extension workers are graduates in extension, while 22 % are graduates of basic sciences (such as, chemistry, physics…) and 43 % have a degree in social sciences. Hence, a great challenge to the extension system of the country is to either train them on extension topics or substitute these workers with more relevant experts. (Shabanali Fami, 2003)

13. Mobilizing Agricultural Graduates to Assist the Extension System under Construction Soldiers Plan

In Iran, every male member of the society must enter military service for two years. Since the year 1998, the government passed a law based on which male graduates in agriculture and related fields can serve in extension system instead of entering military system. The reason behind this decision was to strengthen the expertise of extension system and provide a better condition to make use of human resources in agriculture. These people are called as "Construction Soldiers". They are recruited by the extension system to complete the communication chain between the public extension organizations and rural people. They work as agricultural consultants, instructors, extension workers, and organizers of local extension workers and leaders, distributors of extension printed materials and researchers. The total numbers of soldiers recruited by the Ministry of Jihad-e-Agriculture was 5411 (September 2003). They undergo special training courses before starting their work. The courses are mainly on extension education, communication, instructional technologies, adult education, participatory approaches and techniques and extension planning. After completion of the training period, they are organized and dispatched to different rural areas of the country. A majority of them work in villages and even reside there, while a few of them work in the extension offices that are located at the city or province centers. During the past three years, the construction soldiers have carried out about three million people extension activities per day. The soldiers should report their activities to the extension offices of the region. They receive some assistance from the government. (GDENMS, 2003b).

14. Improving Farmers' Knowledge through Selecting and Introducing Model Farmers (Farmer-to-Farmer Extension)

Each model farmer is a technical leader of his or her community, who better understand and adopt innovations or introduced technologies. They have usually better yield performance as compared to their neighbors. They are mostly literates with courage and enthusiasm to accept and apply new ideas. They are also risk-takers and act as contact farmers or extension workers. The extension system selects and introduces model farmers to the farming community every year. This plan has had many positive effects such as reducing villagers' migration to urban areas, enhancing farmers knowledge and experiences and creating a favorable attitude towards new ideas and technologies in agriculture.

15. To Organize and Support Local Extension Workers

There are about 37326 local extension workers in agricultural extension system of the country, out of which 6.4 per cent is women. They assist the national extension system to bridge the communication gap between agricultural extension offices and rural people. As the extension system pays due attention to participatory extension approach, local extension workers are strengthened, organized and mobilized (Shabanali Fami, 2003).

MAJOR PLANS OF EXTENSION SYSTEM IN IRAN

Deputy of Extension and Farming System is about to implement seven pivotal plans to enhance the structure and functions of the extension system of the country through the improvement of: 1) Extension centers-Standardization;

2) Extension workforce –Training;
3) Extension media- increasing appropriateness to the special groups (rural women and youths);
4) Local and farmers organizations, NGOs and production cooperatives-provision of supportive services to these organizations and community organizations;
5) AKIS - establishing AKIS Network (NEDAK)- application of information technology or ICTs;
6) Farmers contribution and participation in extension services delivery; and
7) Decentralizing and privatizing extension services).(Emadi, 2003).

1. Extension System's Pillars

The extension system in Iran is to play three paramount roles in agricultural development as shown in Figure 1.

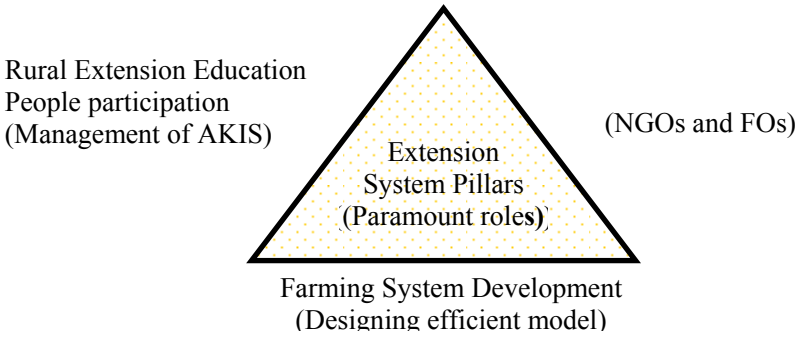

Figure 1. Three Pillars of Extension System in Iran

2. Major Challenges for Agricultural Extension System In Iran

a) To equip extension centers with necessary facilities such as phone line and computer;
b) To improve the gender ratio of extension workers within the system;
c) To educate rural girls as a part of future farmers of Iran;
d) To establish a reliable database emphasizing the gathering of gender desegregated data;
e) To train extension workers on facilitation skills and PRA methods;
f) To clarify the goals and responsibilities of public extension sector as compared with private extension sector; and
g) To develop the management capabilities of extension system, to regulate, monitor and facilitate private sector activities.

3. Prevailing Policies of Extension System

- Delegation of public extension to private sector;
- Absorbing rural extension workers who are local volunteers;
- Improving the access of agricultural producers to the recent research findings;
- Channeling indigenous knowledge and capacities into extension activities; and
- Enhancing institutional diversification or pluralism of extension service providers.

CONCLUSIONS

It is obvious that agriculture requires a more flexible system of delivering information and technological innovations. If extension system intends to play a decisive role in agricultural development, it should be restructured and become pluralistic in nature. However, taking the socio-economic changes into consideration, the following recommendations are proposed to enhance the extension system in Iran:

- New concepts like cyber extension should dominate the extension scenario in the future;
- Proper information management system and database should be developed for each farming system in the country;
- In order to improve the efficiency of extension services, continuous training of extension agents and evaluation of the impact of training should receive a high priority;

- Community-based organizations and SHGs should be more popularized in different parts of the country and play significant role in agriculture;
- Institutional pluralism in extension should be more focused to cope with the chronic problems of public extension system;
- More emphasis should be placed on participatory approaches to agricultural extension and development;
- HRD should be given due importance in different sections of extension system;
- A decision support system to support farmers in the process of decision-making should be developed; and
- Along with public extension system, due importance should be given to the specialized and privatized extension system.

REFERENCES

Anonymous, (1998), National Report on Women, The embassy of the Islamic Republic of Iran, Ottawa, Canada.

Bahrami, A., (2003), A Study On The Performance Of The Private Extension Agencies From The Viewpoints Of The Stakeholders And Rural Beneficiaries And Compare It With The Performance Of Public Extension Using Selected Indicators: A Case Study In Hamadan Province, Iran, Unpublished MSc Thesis, Department of Agricultural Extension and Education, University of Tarbiat Modarres, Tehran.

CAPES (Center for Agricultural Planning and Economic Studies), (1996):, Food security in Islamic Republic of Iran: A country reports to the World Summit, Technical Committee of World Food Summit National Secretariat, CAPES, and Tehran.

Chizari, M, Karbassioun M. and Lindner, J.R., (1998): Obstacles Facing Extension Agents In The Development And Delivery Of Extension Educational Programs For Adult Farmers In The Province Of Esfahan, Iran, Journal of Agricultural Education, 39 (1).

Chizari, M. Pishbin, A.R. and Lindner, J.R. (1997): Self-Perceived Professional Competencies Needed And Possessed By Agricultural Extension Agents In The Fars Province Of Iran. Proceeding of the 13th Annual Association for International Agricultural and Extension Education Conference.

Emadi M.H. (2003): Future Missions of the Deputy of Extension and Farming Systems of the Ministry of Jihad-E- agriculture, Extension Worker Magazine, Special Issue for the First Congress of Agricultural and Natural Resources Extension and Education Sciences, Tehran.

GDENMS (General Directorate of Extension Network Mobilization and Support),(2003a), Plan of Reorganizing National Extension Network, Ministry of Jihad-E- Agriculture, Tehran.

GDENMS (General Directorate of Extension Network Mobilization and Support), 2003b, Introducing Executive Process Of The Plan Of Construction Soldieries, Ministry of Jihad-E-Agriculture, Tehran.

Kannaiyan VC TNAU, S. (2001): Experts from Experts Talks… Globalization, International Extension Forum Newsletter, Vol. 7. Nos. 1 &2.

Karami, E. (1995). Agricultural extension: The question of sustainable development. Journal of Sustainable Agriculture 5: (1/2): 61-72.

Karami, E. (2000). Socio-economic factors, sustainable agriculture. Economic of Wheat. Tehran: Ministry of Agriculture.PP120-159. (In Farsi).

Malek Mohammadi, I, (1998): Agricultural And Natural Resources Extension And Education, Markaz Nashre Daneshgahi, Tehran.

Mohammad Rahimi, (2000): Extension In Agrometeorology Through The Right Type Of Intermediaries, Agrometeorological Department, Ministry of Agriculture INSAM.

ORNWA (Office of Rural/ Nomadic Women's Affairs), (1999): Performance Report On Rural Women, Ministry Of Jihad-E-Sazandegi, Under Secretariat Of Extension And People Participation, The Office of Rural/ Nomadic Women's Affairs, Tehran.

Panicker B.C. and Choudhary M.R.. (2001): Futurology of Extension Education: Indian Perspective, International Extension Forum Newsletter, and Vol. 7. Nos. 1 &2.

Pertev, R. and King, D. (2000): The Essential Role Of Farmers Organizations In Developing Countries, In Agriculture and Rural Development, Vol. 7, No. 1. Pp. 28-30.

Pezeshki-Raad, G., Yoder, E.P. and Diamond J.E. (1994), Educational Competencies Needed By Extension Specialists And Agents In Iran, J. of International Agricultural and Extension Education (1),45-53.

Rezaei-Moghaddam K. (1998). Agricultural Extension, Poverty And Sustainable Agriculture In Behbahan County. M.S. thesis, Dept. of Agricultural Education and Extension, Shiraz University, Shiraz, Iran.

RWDO (Rural Women's Development Office), (1996): Goals and objectives, Ministry of Agriculture, RWDO, Tehran.

Shabanali Fami, H. (2000): Participation Of Rural Women In Mixed Farming In Iran, Unpublished thesis, University of Agricultural Sciences, Bangalore, India.

Shabanali Fami, H., (2003): Plan of determining educational needs of Iranian Rural Women, Projects 7 & 8, Ministry of Jihad-E- Agriculture , Tehran.

Tohid, L. (1997): Rural Women's Cooperatives; Objectives And Activities, Ministry of Agriculture, Rural Women's Extension Office, Tehran.

Warren, D.M. (1976): Indigenous Knowledge Systems For Activating Local Decision-Making Groups In Rural Development. In: G.Chu et al. (eds) Communications for Group Transformation in Development, pp. 307-329. (Communications Monograph No.2). The East West Center, Honolulu.

Warren, D.M. (1988): Linking Scientific And Indigenous Agricultural Systems. In: J. Lin Compton (Ed), The Transformation of International Agricultural Research and Development. Westview Press (in press), Boulder.

World Bank, (1994): Fact Sheet: Iran-Women, Agriculture And Rural Development, National Sectional Report On Women, Agriculture and Rural Development, In: Worldbank Atlas, Worldbank, Washington D.C.

6. LAO PDR

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INTRODUCTION

The Lao's People Democratic Republic, in short Lao PDR is spread over an area of 236,800 square km, the major part being mountainous and forested. The country is divided into three geographical areas: the Northern, the Central, and the Southern areas.

The Mekong River flows through 1,865 km of Lao PDR territory and forms the major portion of the border with Thailand (1,835 km). About 60% of the water entering this major river system originates in Lao PDR.

Population: Lao PDR has a population of 4,474,000 inhabitants (projects 1993) comprising over 47 different ethnic groups. The population density is 19.0 persons per square km, life expectancy of 50.9 years, and an adult literacy of 50%, as reported in 1992.

Climate: Lao PDR has a tropical climate with only two distinctive seasons. From the early May to the end of September it's rainy season, and from October to April it's dry season. The average temperature is about 28 degrees centigrade, but in may raise up to 38 degrees centigrade in April. In the mountainous area, however, the weather is cold from December to February, in the neighborhood of 15ºC.

THE ECONOMY OF LAO P.D.R

The economy of Lao depends primarily on agriculture, and constitutes roughly 50% of the country's GDP. The agricultural economy covers a wide rang of activities from subsistence farming and production to large-scale industrial agriculture. Approximately 80% of the population is employed within the agricultural sector, while the remaining 20% finds employment with the industrial and service sector. Apart from agriculture, Lao's main economic resources are wood and forest products, hydroelectricity, and minerals. Unfortunately, the current physical infrastructure, domestic resources, skilled labor, and institutional resources are significantly inadequate and are unable to support a growing economy. Economic development depends on the improvement of the country's physical infrastructure and has been the subject of long range governmental planning.

Recently, the economy has displayed signs of improvement: agriculture production has increased due to an expansion of irrigation systems, and consistent favorable weather. The government has developed policies to promote agricultural exports, and increase favorable cross border trade.

To become more integrated into international economics, the government of Lao has a step-by-step reform plan to change the economic structure of the country. The economic infrastructure, which was once centrally controlled, has been changed into a market-orientated system, allowing for private enterprise and foreign investment. These amendments to investment laws have attracted a significant increase in foreign investors and have been achieved with the aid of international finance systems such as the World Bank and the Asian Development Bank.

AGRICULTURE

With more than 80 percent of Lao's population employed in Agriculture, it is of utmost importance to ensure that the country and its citizens are aware of and informed about recent technological advancements in farming methods. With a large majority of the farming population living in rural areas, remote from urban centers, this is not always an easy task. It is therefore the responsibility of the Extension Office of Lao, by acting as the linking body between government institutions and the farming population to ensure the successful dissemination of information.

Frequently, the Extension Office must also adapt these new technologies, received from neighboring countries, to the specific climate and lifestyle of Lao. Thus, it is the Agriculture and Forestry Extension Office's primary endeavor to provide relevant education and appropriate training to the farmers of Lao, and ensure the growth, utilization, and sustainability of agricultural advancements.

CURRENT STATUS OF AGRICULTURE EXTENSION SERVICE IN LAO

The Agriculture and Forestry Extension Service of Vientiane City was formed in 1991 as a branch of the Ministry of Agriculture and Forestry (MAF) and since has reported to the Department of Agriculture and Forestry for Vientiane Municipality, and the MAF. The MAF has promoted their programs following their own ideas, which have been focused on infrastructure development for agriculture. The Provincial Agriculture and Forestry Offices (PAFO) and the District Agriculture and Forestry Offices (DAFO) have been conducting extension campaigns upon the instructions of the MAF. The Extension workers work as generalists at the district level. They simultaneously cover all aspects of agriculture, forestry and livestock. In 1995, out of a need to expand and create specific concentrations, Extension Service was divided into four sections each with its own focus and objectives. A pilot project was initiated in 1996.

The four sections of the Extension Service and their focus, are:

1. Agriculture Extension
Focus: Rice production, seed technology, vegetable, fruit and industrial crops, preparation and production of harvesting equipment, food reliability and assurance.

2. Livestock Raising Extension
Focus: Livestock husbandry with domesticated animals such as buffalo, cow, pig, goat, fish and poultry.

3. Forestry Extension
Focus: Seedling production and reforestation in order to deter slash and burn agriculture, conserve endangered forest areas, ensure the safety of aquatic and wild animals, and provide a fixed livelihood for farmers and their families.

4. Irrigation Extension
Focus: Installation and maintenance of water pumps and irrigation systems to meet the farmers' water demands, organization of village cooperatives for irrigation maintenance.

5. Objectives of the Extension Service of Lao

Currently, the objectives of the Extension Service, as outlined in the *Project Proposal on Agriculture and Forestry Extension 2002-2004*, are three-fold and occur in succession of one another:

Primary Needs: The main concern of the Extension Service in Lao is to ensure that the farmers are able to meet the basic needs of their families. For the typical Lao household this includes: rice production, livestock raising and fruit harvesting.

Exportable Commodities*:* Once able to meet the needs of their families, the farmers can focus on the production of exportable commodities for profit. Many areas in Lao have proved to be very suitable for the production of exportable crops. Examples of these are: Cotton in Sayabouli Province, and Coffee and Fruit in the Bolaven Plateau.

Stabilization*:* Large numbers of farmers continue to practice shifting cultivation (slash and burn agriculture) for upland rice. This type of production has proved to be unsuccessful, damaging to the environment, and is no longer sustainable. To discourage this form of cultivation, the extension staff must not only provide technical recommendations, but must operate with a strong understanding of the development process.

EXTENSION METHODOLOGICAL TOOLS

To achieve the above objectives, the extension service employs the following methodologies:

1. Extension Worker/Field Work

The extension worker is the essential element of the Extension Service. Each district, under the management of the extension service is assigned at least one extension worker who can work intimately both with the farmers and the extension office. The relationship that the extension worker has with the farmer is very important to the Extension Service for he/she is able to understand the farmer's thoughts, needs, and unique conditions. It is through fieldwork that the extension worker communicates with the farmer and is able to investigate crop growth, test cultivation and breeding methods, and demonstrate new

technologies and species varieties. Being sufficiently staffed, farm visits, tours and on-site educational training are the backbone to Lao's extension service. It is strongly believed that regardless of financial constraints, this form of fieldwork is the most successful and effective extension methodology.

2. Office Preparation

After the extension staff has completed research, the extension office aims to critically examine the gathered observations. Information is collected and appropriate actions are suggested and discussed according to market research, government policy, future plans, and available technologies. In order to be well aware of the available options, extension staff frequently attends training sessions on agricultural technologies, government policies, and methods of information dissemination.

3. Information Dissemination/Training

Most of the training that extension workers organize, for the farmers, occurs on-site. The Extension Office aims to form small groups of farmers who share environmental conditions and problems. The coordination of these small collectives promotes discussion amongst farmers and villages, and encourages the sharing of experience and knowledge, especially with respect to the use of natural resources and new production equipment. Therefore, to ensure the sustainability of agricultural development and the autonomy of the farmers, the extension staff focuses on training a district trainer/manager from within the small collective who then is able to pass the knowledge and skills onto his village and farmers? This method allows the village and farming group to function independently of the Extension Office and encourages self-sufficiency.

4. Publications

Currently, the Extension Division is publishing pamphlets to accompany all training sessions. Within their limited capacity, the Extension Officials create simple, but informative guide books that elaborate on the information of the training sessions using statistics, diagrams and photographs. The pamphlets are an important part of the training, for they allow the farmer to maintain a reference for the training session.

ENHANCING THE EXTENSION SERVICES OF LAO

1. Low Priority for Extension Services

The Extension Office is a relatively new section of the MAF and thus has only recently emerged as a fully functioning service. In the initial creation of the Service a large limitation was the low priority for actual extension activities. The early establishment of the Extension Service required a large amount of data collection, co-ordination, infrastructure development, and policy creation. Thus it is not possible to give informed training and assistance to farmers until this is complete. Unfortunately, many of these issues remain incomplete and the extension officials are still forced to deal with insufficient organization, policy, and management of the Extension Office.

2. Underdeveloped Extension Methodologies

A major concern for the Extension Services of Lao is the lack of concrete methodologies. While we do believe strongly in fieldwork, the organization of farming support groups, and the creation of publications, these methodologies are severely lacking in their manner of implementation. Frequently, the training provided occurs without any preparation or follow-up activities for the farmers. As a result, training sessions become simply a promotion of a new technology, specific variety, or farming method rather than a transfer of knowledge. The cause of this poor implementation is due to the farmer's readiness to accept assistance, the formation and dissolution of local farming groups, and severe weather conditions. The Extension Office of Lao does not have the resources to adapt to irregular events and conditions and therefore cannot always maintain a consistent training project from creation, through implementation, into a follow up.

3. Lack of Technical Skills and Resources

Due to the limitations of institutional/educational infrastructure of Lao P.D.R, the extension staff themselves suffer from severely limited technical knowledge, and experience. Even though training is given in new farming production methods and technologies, the extension staff lacks the basis on which to build this information upon. As a result, the staff does not identify with the project, nor possess personal objectives, but simply operates in accordance with directions and policy. This is the most severe issue facing the development of Lao's extension system because the department has limited resources upon which to change the situation. Currently the department is working along side the Mennonite Central Committee (MCC), FAO, the Asian Development Bank (ADB), and CUSO - a Canadian NGO, and other

NGO's to increase the extension staff's technical experience, knowledge, and resources. While this is a positive development, there is significant work that has yet to be done in this field.

REFERENCES

Project Proposal from the Department of Agriculture and Extension Services, 1996, Vientiane, Lao P.D.R

State Statistical Centre, 1995, Vientiane Lao P.D.R

Socio-Economic Department Strategies, 1994, Vientiane, Lao P.D.R

Organizational Publication Lao P.D.R, 1996, Vientiane Lao P.D.R

Lao Agricultural and Rural Development in Vientiane, 1998, Vientiane, Lao P.D.R

7. MONGOLIA

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INTRODUCTION

Mongolia is a land locked country situated in East Asia. The total land area of the country is 1,565 million sq. km, with a population of 2.5 million (2000).

The terrain of the country is one of mountains and rolling plateaus, with a high degree of relief. Overall, the land slopes from the high Altai Mountains of the west and the north to plains and depressions in the east and the south.

The Country has four seasons, spring, summer, autumn and winter. It has a semi-arid continental climate. It has low humidity, low precipitation and high evapotranspiration. Winter temperature average is –35ºC, while the summer average is +30ºC. Snow and rainfall are very low, the climate being arid. However, enough rain usually occurs in July and August to swell rivers, and snow blizzards can occur in winter. Mongolia is a remote country with limited transport and energy infrastructure, small domestic market, harsh climate, landlocked geography, nomadic livestock and low population density all factors make it a difficult country to operate in.

Mongolia has 1.2 million ha of arable land. By 1999, Mongolia had 35.5 million heads of livestock. Annually 250 thousand tons of cashmere and 30 million-liters of milk are processed, but in 2000, this were reduced due to an extremely harsh winter and drought conditions.

AGRICULTURE

Mongolian food and agro-industry sector consists of processing and food industry, livestock and crop production**.** The output of livestock production comprised 82.7% of the total output of agriculture. The number of livestock by five types (horse, camel, cattle, sheep and goat) was 26.1 million heads at the end of 2002.

Livestock is the main livelihood and source of wealth in Mongolia and the country's economy substantially depends on the production and development of this sector. Around 35 percent of GDP and one fourth of export sales are contributed by the agricultural sector. Approximately 49 percent of the total labor force is engaged in this sector. As a result of privatization, some 97.2 percent of the total livestock is now privately owned.

The average number of animals per household is 141. Recent weather patterns, including global warming which ravaged Mongolia frequently, have had a very negative impact on agricultural production. Mongolia is getting dryer and very prone to hazardous natural disasters. Drought and difficult terrain have led to poor development of infrastructure. Poor banking and credit systems in the rural areas and shortage of supplies of cash for working capital and investment have also negatively influenced the development of the agricultural sector. Agricultural producers have not significantly joined cooperatives to share labor. They are sparsely located in distant areas, far from education, cultural and health services and markets. These difficulties are creating a tendency towards migration from rural to urban areas.

AGRICULTURAL POLICY

The main objectives of the economic policy for 2003 are to accelerate economic growth, enhance social security services and deepen the rural development through improvements in economic and financial conditions, promotion of domestic industries with a focus on export production, while providing for sustainable recovery in the agricultural and cropping industries.

The primary objective of the food and agro-industry sector is to encourage regional and rural development to provide economic growth and to create favorable environment for sustainable development of the food and agricultural sector.

The main goals underlying the strategy for livestock sector development are: (a) to provide sustainable livestock development; (b) to increase the export of livestock products and raw materials; (c) to create favorable conditions to rural herders and dwellers for a comfortable life in their native places to help improve livestock quality and breeding; (d) preventing outbreaks of infectious diseases; and (e) improving capacity building for protection against natural disasters.

The Government is supporting the herders to improve the health of livestock, to improve water supplies and to create reserves of fodder. Measures are taken to improve health protection, breeding and quality of livestock. These measures should help to increase the number of livestock and related production, which is an important contributor to overall economic growth.

Currently, the Government of Mongolia and the donor community cooperate closely in planning and implementing projects in specific areas of agricultural development that include crop and livestock development, seed production and multiplication, veterinary services and rural development.

AGRICULTURAL EXTENSION SERVICE IN MONGOLIA

1. Current Situation of the Mongolian Agricultural Extension Service

Agricultural Extension is a new service that has been introduced since the institution of the agricultural policy reforms in Mongolia. The National Agricultural Extension Center (NAEC) was established by the Government under the Ministry of Food and Agriculture in November, 1996. The center operates with the main objectives to provide with technical and business advice to food producers, herders, crop producers, and assist them through advice on the profitable running of their farm business, and provide regular updated /new/ information to producers.

The Extension center is publicizing traditional technologies and research achievements to producers and providing them with advice and support on development of projects and business planning to expand and intensify their business activities and transferring technologies. Thus, the Agricultural Extension Centre is acting as a main lever to assist the less-experienced agricultural producers and farmers on utilizing fertility fully, expanding their production, improving their income and raising the standard of living.

The NAEC with 10 staff members at the headquarters, is located in Ulaanbaatar. About 50 researchers are voluntarily working as part time extension workers in different areas of the agriculture sector. The aimag office (province) consists of one formal extension worker and 6-7 part time advisors. The key organizational features of NAEC are:

1) There is one official extension agent and advisory group with 6-7 non-official agents in each aimag /province/. There are over 120 non-official extension agents throughout the country;
2) There is an advisory group near by the NAEC which includes 60 experts /scientists;
3) Since its establishment, the NAEC has organized several trainings on Extension service to all extension workers including staff and advisors, AEC's managers of province. Beside this the NAEC organizes regional trainings on animal husbandry and crop production for agricultural producers of aimags and soums;
4) NAEC developed and disseminated a number of information and handouts, books, leaflets for herdsmen and crop producers. Also organized distance-learning trainings for agricultural producers by Mongolian National Television and Radio; and
5) In order to transfer and to advertise advanced and traditional /folk/ technologies to the producers, NAEC organized field demonstrations, exhibitions, and study tours for producers.

2. Responsibilities of the NAEC

The main objective of the NAEC is to provide technical advice to agricultural producers, entities and organizations of all ownership types to run their business in efficient ways through the improvement of human resource skills, assist them in introducing scientific achievements, advanced techniques and technologies on a contractual basis, and act as mediator.

3. Main Activities of the NAEC

a) Conducting trainings*:*

- Specialized training for local extension workers, subject matter specialists of the branches and guest advisors from the research institutions
- Technical trainings and seminars on agriculture and livestock issues for farmers and herders of provinces (aimag) and sub districts (soum)
- Trainings are conducted by local AECs and teams
- Distance learning courses for farmers, herders
- All types of trainings which meet the demands of farmers and interest on food and agriculture production

b) Providing advisory services:

- Technical advice on production and business management, technology improvement for agricultural producers, small farmers and households
- Advice on how to start new business and production for individuals and entities
- Developing and designing project proposals and business plans for individuals, entities and organizations and provide assistance for them

c) Information dissemination and advocacy:

- Information diffusion through Mongolian TV and radio program, newspaper and magazines
- Select and disseminate new agriculture related information to the farmers and herders from the internet and other formal resources through the mass media
- Distribute the brochures, handouts and pamphlets to the farmers and herders through extension network

d) Technology development and their transfer:

- Developing close cooperation with research institutions and researchers
- Selecting and recommending potential results to agriculture producers based on the review and evaluation of the existing production technology, research results and recommendations, production models and research reports
- Distributing information on improvement of the production technology through the Extension network
- Acting as a mediator to transfer know-how and knowledge to the producers

e) International cooperation:

- Projects, programs funded by Asian Development Bank (ADB), United Nations Development Programme (UNDP), Food and Agriculture Organization (FAO), Danish Development Agency (DANIDA), Technical Assistance to the Common wealth of Independent States (TACIS), Joint Christian Service (JCS)
- 1999-2001 TACIS project
- "Crop development": Establishment of the 5 regional extension centers under this project was initiated and an extension on network has setup in rural areas
- 2002 Newly initiated TACIS project on Integrated crop and livestock sector development: Three local extension centers were established under this project

ORGANIZATIONAL CHART OF THE MONGOLIAN EXTENSION SERVICES

Agricultural extension network in Mongolia is integrated as depicted in Figure 1.

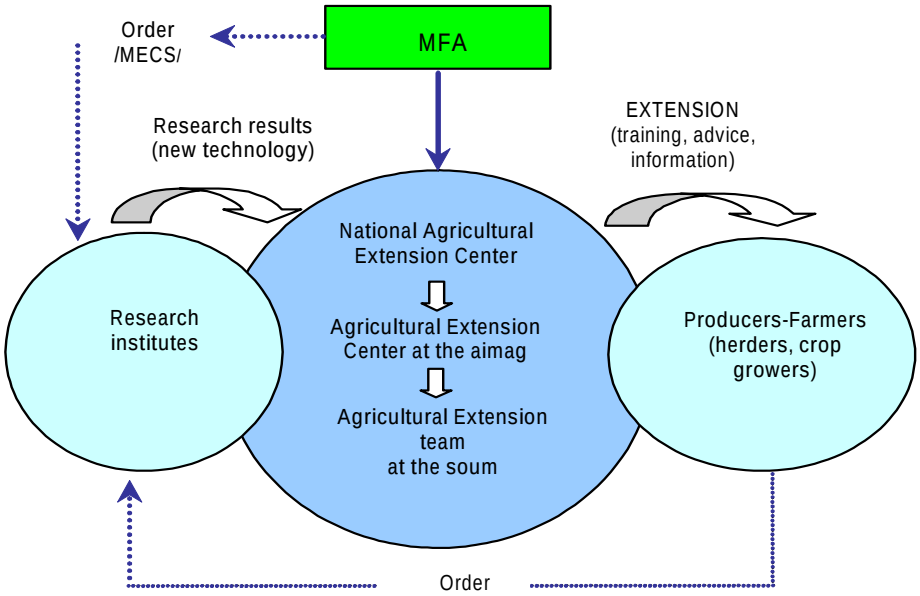

Figure 1. Agricultural Extension Network in Mongolia

During the last 5 years since it was established, 54701 producers /food and crop producers, herders/ and 809 entities have attended 449 trainings and workshops, conducted by the AEC. The Center has provided technical advice to 13481 producers and 363 kinds of information distributed as well as 14

TV programs and 83 radio programs, 10 publications to newspapers. At the same time they have distributed 10 booklets, 80 brochures, leaflets, instructions for producers and also organized 6 demonstration and field days. But there is lack of infrastructure and technical capacity to provide agricultural producers with training, as well as new information and advice regularly. However, progressive agricultural producers demand more training to improve their existing knowledge and skills, and to search for new information on research achievements, advanced techniques and technologies. This is the evidence from their eagerness for more information on market economy conditions.

CHALLENGES FACING MONGOLIAN AGRICULTURAL EXTENSION SERVICES

There is a great need to establish a modern system, which will provide rural agricultural producers with new information of research achievements, to organize trainings and to transfer advanced technology to production. Due to constraints related to distances between producers and poor infrastructure in rural areas like communication, electricity and roads; the extension center cannot reach and train workers and producers living in remote areas on a regular basis. This is the main background of developing this program.

- The establishment of agricultural extension centers in aimags and soums, was limited due to financial shortage. AECs have been established in 14 aimag's since 2001 by using the resources of National Agricultural Extension Center (NAEC) and financial support the Ministry of Food & Agriculture and projects implemented by international organizations but the other aimags in capital city still do not have AECs.
- The establishment of local branches in provinces /soums/ and extension of operational rural networking in rural areas in order to bring the services to consumers in the countryside is in initial stages.
- Presently, there are no possibilities to train specialized extension staff due to lack of specified institutes, and research programs.
- Due to the lack of well-equipped training halls, facilities for training, and necessary techniques and equipments, there is a limited possibility to disseminate updated information and to train researchers, farmer advisors and specialists in order to prepare national extension workers.
- In order to apply distance learning for agricultural producers in order to improve the process of advising on technological matters and to intensify the adoption processes, intensive trainings have to be organized through a Distance learning studio under NAEC.
- There is a great need to establish an integrated animal and crop production demonstration farm at the NAEC to conduct studies, and to identify possibilities for the implementation of foreign and home experiences, and to transfer results of the research projects. On one hand, it would be in the initial stage of transferring new technologies, on other hand, it will influence the control of the adoption of new technologies, developed by research institutes.

If we could resolve above challenges immediately, the agricultural extension activities will be extended to farmers and producers. This would increase the possibility of increasing the food and agricultural production as well as incomes of the farmers and producers who are currently running their business based on the acquired indigenous knowledge, skills and information.

DEVELOPMENT PERSPECTIVES OF THE NAEC

- Need to develop medium term extension development programs and define strategy for implementation;
- To complete the establishing aimag (province) extension network by year 2004;
- Train the local extension workers team to be employed by the soum (sub-district) extension office;
- Organize study tours and domestic training courses to re-train extension staff at the headquarters on extension methods and skills, contact farmers and researches;
- Include a new subject on extension education into the curriculum of agricultural university, colleges and vocational training centers;
- Widely apply distance learning and mobile approaches in extension services;
- Make use of donor funded projects on agricultural sector to strengthen capacity of the extension services in Mongolia; and
- Develop extension services towards minimizing risk, upgrading management approaches and skills, and managing production and agro business, efficiently based on this knowledge.

The service to support agricultural and food producers (herdsmen, food and crop producers) on their beneficial business practices, assist them to adopt and transfer advanced technique and technology in production, provide them with all types of information, advertisement and to transfer new knowledge by

conducting trainings is in great demand today. In order to meet these requirements, there is a necessity to set up the extension network and to establish AECs in each aimag and soum which will provide these services, though the financial source are limited.

To address this problem, Mongolia has developed medium term programs on developing agricultural extension service.

1. Goal and objectives of the program

The main goal of the program is to set up agricultural extension network throughout the country and to strengthen the capability of extension workers in order to assist and support agricultural producers in acquiring and adopting new and advanced technologies in production and in increasing their production and management skills in the market economy through training and demonstration activities, and providing them updated information on modern production technologies, techniques and research results; policy and decision of the Government.

The objectives that will be implemented in the framework of the program are:

- First: To strengthen the capacity of the NAEC and to provide with necessary techniques and equipments;
- Second: To strengthen the capacity of the local AEC's and motivate the extension workers, and provide them with financial and other support to improve their activity and interests;
- Third: To conduct regular trainings and disseminate information to agricultural producers on aspects of transferring new and advanced techniques and technology in agricultural production, and increase their efficiency of production and businesses through providing new knowledge;
- Fourth: To place an order to research institutes on development of advanced technologies which are suited to small-scale farms;
- Fifth: To prepare extension specialists through conducting training courses;
- Sixth: To disseminate information and give advice /consult/ to farmers on increasing their family income through integrating; and
- Seventh: agricultural extension service will execute an important role in Rural development of the country and will be the main way of delivering the Government's policy on increasing the standard of living of the producers.

With ultimate goals to achieve the following:

a) To develop a complex system of the extension activity such as information, training, publicity /advertising/ and assessment, adjusting with the current situation; and

b) To establish a communication between research institutes and producers (herdsman, crop producers) in order to bring the research results to production in a short time and to improve the efficiency of production by introducing and adopting new technology.

2. Expected results during 2003 - 2010

i. ***Network set-up***:

a) To be extended networks up to province level /extension centers in all 21 aimags;
b) Extension group will be established in 100 soums and will be equipped;

ii. ***Training courses and information Diffusion***:

a) Over 100,000 herders and 40,000 crop producers of the 21 aimags and 100 soums will attend the specialized training courses relating to new technologies;
b) Will set-up distance learning studio;
c) 150-200 extension staffs of the aimag and soum centers will attend to the extension specified trainings courses;
d) Opportunities will be used to train extension specialists at the Agricultural Universities and colleges; and
e) Over 80 percent of the advisors, consultants-researchers will attend to specialized extension trainings abroad and locally;

iii. ***Strengthening the national and local /aimag's/ AECs***:

a) Will establish information and training center /hall/ at the National and 5 aimag's AECs;
b) Will train extension specialists in all the centers at all extension units at the National and aimag's AECs with new information such as handouts, product standards, technology using methods, prescription on new techniques and technologies, and information about foreign advanced techniques and technologies, books, etc., will provide a library.

iv. ***Transferring of the new techniques and technologies***:

a) Close cooperation will be set-up between farmers and researchers that will increase efficiency of production;

b) Will establish the demonstration farm under the center;
c) 50 % of the technology development subscription will be done by producers;
d) The new opportunities will formalize the payment system for subscripted projects /producers will cover some research projects expenditure such as 20% of the projects subscripted by them; and
e) Farmers associations and cooperatives will be set-up by farmers and producers/, that will influence production efficiency by 2-5%.

v. ***Consultancy and advertisement /publicity*****:**

a) Will develop and distribute over 1200 handouts/leaflets to food and agricultural producers to improve their knowledge of economy and food processing, mechanization, crop husbandry, preventive measures for livestock diseases /technical advises/ etc;
b) Will write and publish special books on agriculture and extension service;
c) Will develop programs that reflect the history, future, goals and objectives of the Agricultural Extension service in Mongolia; and
d) The service will be in good partnership with farmers and producers who will understand its importance and need.

These are the current priorities and programs of NAEC. NAEC also requires more international linkages to improve its capacity to effectively serve the producers and herders of Mongolia.

8. NEPAL

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BACKGROUND

Agriculture is the mainstay of the Nepalese economy. People, land and water are the three major resources of the country. Since the development of Nepal mainly relies on agriculture, the government has, therefore, accorded agriculture the highest priority in all the five-year plans of the country.

In view of faster development in agriculture, the government prepared a 20 year Agriculture Perspective Plan (APP) in 1996. It has focused on four priority issues namely (i) irrigation, (ii) fertilizer, (iii) infrastructure (road and power), and (iv) technology. The sustained application of these inputs through a system of "priority productivity package" would be the means of increasing the growth of crop and livestock production.

Furthermore, APP has adopted "pocket package strategy" in which a commodity based production pocket is identified with a clear geographical demarcation. Farmers' groups within the identified pocket are then formed and established to carry out commodity projects. Based on the advancement stage of the pocket, packages of technology are then designed and utilized for optimizing benefits.

There are plenty of opportunities for crop diversification. This is because of the climatic and socio-economic diversities in the country. Nepal has several ecological divisions enriched with tropical/subtropical climate in the Terai (The Valley Areas), temperate climate in the hills and snowy climate in the Himalayan regions though. Terai region has only 17 percent of land it, produces a major share of food grains in the country. Because of diversities, no single model of extension effectively works in the country. Consequently, different approaches need to be designed and implemented. Farmers in the hillside have different socio-economic conditions and accordingly they have different program needs compared to Terai farmers.

Extension system with pocket package strategy and farmer's group approach is now adopted all over Nepal. Efforts are being made to strengthen farmer's groups so that the group can stand on their own.

REVIEW OF AGRICULTURE EXTENSION SYSTEM IN NEPAL

1. Approaches Adopted in the Past

Many attempts were made in the past to reform and strengthen agricultural extension system (AES). These attempts include:

i. ***Training and Visit System (T&V)***: This system is based on the principle of single line of command with continuous training and contacts. Research-extension linkage was strong, though material support for adoption was quite weak.
ii. ***Integrated Rural Development Approach***: This approach is based on the integration and coordinated management of resources for rural development. Technology support was however not adequate.
iii. ***Tuki (multiple progressive farmers) Approach***: This approach had the thrust of utilizing trained local farmers based on the self-motivation. These farmers were also working as principle agri-input dealers, so that the technological message could go along with the inputs required.
iv. ***Farming System Research and Extension Approach***: This approach viewed research and extension in the whole farming system perspective, so that cropping system research could be done. Farmers would know the interdependencies between components and could relate to physical, biological and socio-economic factors.
v. ***Block Production Program***: This program was based on the principle that intensive use of resources consolidated together in an area called "block" could increase productivity. This was not effective for scattered area.

These approaches were implemented through the support of donor agencies. This actually resulted in multiple extension approaches at the district at the same time, confusing to the implementer and reducing the clarity of objectives, roles and targets of extension.

2. Approaches Adopted at Present

1) ***Conventional Educational Approach***: Agricultural extension system always attempts to educate farmers and other concerned stakeholders by communicating the skills. The skills are imparted by means of different techniques of extension education categorized into individual methods, group methods and mass methods. These methods are being used for changing knowledge, skills and attitudes of farmers in a positive manner, so that the farmers ultimately show their changed behavior by adopting new innovation. In this approach, the farmer leader in particular is trained and utilized to diffuse the technologies to his neighbors. It is a continuous process to educate and disseminate the message. This approach is in operation even now through government organizations.
2) ***Commodity Group Approach***: This approach has been widely implemented by both public and private sector organizations.
   a) ***Public Sector***: District Agriculture Development Office (DADO) established in all the 75 districts of the country under the Department of Agriculture (DOA) of the Ministry of Agriculture and Cooperatives (MOAC) operates its extension services through Agriculture Service Centers (ASC) and Agriculture Service Sub-Centers (ASSC) at the grass root level. The organizational Chart of AES in Nepal is depicted at Annexure I.
   b) ***Private Sectors and NGOs*****:** Apart from the public sector organizations mentioned above, there are several agencies and private service providers and several hundreds NGOs supporting agricultural extension activities in the country. These organizations work mostly with commodity groups either individually, through the funding of donor agencies or at partnership basis. These are primarily involved in the production and marketing of seeds, fruit saplings, fingerlings and supplying of sprayers, fertilizers, pesticides agricultural tools so and so forth.
3) ***Farmers Field School***: Farmers' field schools were established for developing field-training methods as a part of Integrated Pest Management Program (IPMP)). Field schools have been proved to be an effective means of reaching farmers and helping them to have an access to the knowledge and skills required for crop production and pest management. Furthermore, the farmer's field school is a discovery based on the adult learning approach. A group of farmers attend at regular intervals and learning a participatory manner. This approach is becoming popular because of its democratic and participatory process.
4) ***Modernization of Extension System***:
   a) ***Extension services***: The present extension services are being improved through:
      - Projectization;
      - Revitalizing the training system;
      - Improved M&E system;
      - Revitalizing the mass media system; and
      - Net working central and regional extension programs to the districts and grass roots.
   b) ***Pluralism in extension***: There are a no. of stakeholders to be involved and a no. of concerns and issues to be addressed through extension. A pluralistic extension approach is therefore needed. This approach is being exercised through:
      - Strengthening farmers' organizations;
      - Partnership with private service providers; and
      - Contracting extension services.
   c) ***Decentralization***: In Nepalese administrative set up, District Development Committee (DDC), an autonomous body, is entrusted with the responsibilities of development activities of the district. Accordingly, the devolution of agriculture programs has been done. Decentralization is being improved through:
      - Exercising bottom up planning;
      - Updating district data base and inventories; and
      - Strengthening functional mechanisms with DDC.
   d) ***Human Resource Development and Management Reform***: In order to address the growing issues in the extension system, human resources need to be strengthened and management needs to be reformed. With the realization of this, the government is undergoing the followings at regular basis:
      - Staff orientation
      - Extension staff in-service training
      - Human resource management reforms

5) ***Coordination and Linkages***: The earlier model of coordination and linkages, were limited only within government organizations. Now, this has been tremendously reformed, by accommodating all sector stakeholders in linkage mechanism, both public and private and fund providers, Efforts are being made to coordinate the functions of stakeholders concerned through an appropriate technique. Both these models (old i.e. linear model and the new i.e. pluralistic model) are depicted at Annexure III.

6) ***Participatory Process*:** Surrounded by different constraints and opportunities, farmers form different attitudes thereby arousing different needs towards the programs. In order to reflect their needs, programs are being planned and implemented through the participatory process. Actually the farmers participate in the planning workshop and express their needs towards the programs and then DADOs formulate the programs on the basis of these needs.

ISSUES AND PROBLEMS FACED IN AES

1. Issues Mentioned by Agricultural Sector Performance Review

Overall impact of APP policy reforms and programs have been positive, though they are still modest and fragile. A part of this is due to lower than expected public expenditure on agriculture during the 9th five-year plan period. APP implementation was affected in general by:

i. Insufficient governance in sector institutions to deliver the intended services effectively and efficiently;
ii. Insufficient participatory process to support and monitor sound planning and implementation.
iii. Inadequate coordination among sector agencies in promoting multi sector and strategies approach called for in APP;
iv. Limited access to improved seeds, in particular food grains due to low private sector interest.
v. Low use of fertilizer;
vi. Limited availability and quality of extension services;
vii. Limited access to credit for the majority of rural population;
viii. Lack of progress in extending rural road network and other marketing structure; and
ix. Uncertainty and lack of marketing opportunities in particular, for perishable cash crops.

2. Low Service Coverage

Service coverage by public sector AES is limited to only 8 percent. It means a large sector of farmers is left out of services. Two types of strategy have been taken to expand it:

- ***Farmer Group Approach***: Farmers group is assigned with a command area where each of the members of the group will have to provide service to the farmers there in.
- Strengthening NGOs/CBOs/POs to national AES. Government has formulated a policy to encourage the participation of NGOs/CBOs/POs in development programs; accordingly these organizations are coming to join hands in agricultural extension services.

3. Low Productivity and Lack of Commercialization

The agriculture sector accounts for nearly 39 percent of GDP and provides employment for 70 percent of the population. Productivity of paddy, maize and wheat, which accounts for over 80 percent of cultivated land still remains 2.5, 1.7 and 1.6 tons/hectare, respectively. This is the lowest among neighboring countries in South Asia. However, yield growth of cereals picked up with a stronger growth trend exhibited by commercial crops such as oil seeds, potato and fruits. The majority of agriculture is still subsistence oriented. For the commercialization and diversification of agriculture, an integrated package of technologies, inputs and credits are made accessible to farmers in a way that could massively be made use of.

4. Less Attention to Poor and Disadvantaged People

Although the development programs whether agricultural or related to other field, regular programs or donor supported ones, in principle, are intended to reduce poverty, it does not happen in practice. Programs often fail to accommodate the poor and disadvantaged sectors. The facilities created are not accessible to this sector. Consequently, a large part of the extension services remains outside the reach of a larger sectors farm community, particularly the resource-poor and landless farmers.

5. Low Technical Competencies in the Staff

In Nepal, Junior Technician (JTs) and Junior Technical Assistants (JTAs) who are the front liner in agriculture extension are not technically competent enough to cope with the changing complexities and growing desires of the farmers.

RECOMMENDATION FOR STRENGTHENING AES IN NEPAL

The following measures are suggested to strengthen the AES in Nepal:

a) Strengthening Farmer's Group

Commodity-based farmer's group approach is becoming popular and effective day by day. Farmers organized into groups might play a vital role for the development of commodity on which the group has footed. Through such groups, a system can be institutionalized. However, some of the key elements for group strengthening are suggested here:

- Farmer's group to be considered as one among a number of methods for extension activity.
- Increase the intensity of interaction with farmer's groups.
- Establish farmer's group profile.
- Organized a participatory workshop with the selected farmer's groups to learn lessons.
- Provide guidance till the group starts self-functioning.

b) Social Mobilization to be Considered as a Vital Component in Extension

Development programs, in general, and those in agriculture, in particular, designed and implemented for improving the socio economic conditions in the rural poor and socially deprived communities, have met with limited success, in many developing countries, Nepal. This could be attributed to the fact that many such programs, by and large, have been planned and implemented based on the perception and understanding of development agencies. The target communities have not been adequately involved in the overall process of planning and implementation of the programs. The people's needs and aspirations could not be duly addressed, and as a consequence, thereof, the development efforts suffered in respect to some key aspects like smoothness of implementation, realization of specified objectives and sustainability of programs.

In recent years, there has been growing realization that genuine participatory development is highly needed. Various development agencies and the governments therefore increasingly recognize that willing and effective participation of civil society is a necessary condition for effective extension programs. The stronger step in social mobilization could be a new dimension to extension system for Nepal.

c) Creation of Opportunities and Accessibility of Resources

Creation of realistic and appropriate opportunities is a key challenge of the extension system. Experiences have shown that the agricultural production and productivity of small farmers reached high levels when the necessary inputs and services were provided. In Nepal more than 60 percent of the farmers are small, with less than 0.5 ha. size land holdings. Unless special attention is given to these small and marginal farmers, the extension system cannot succeed. Therefore, extension messages and programs should be adjusted or designed to match the needs of different target groups (small, medium, large or commercial farmers) and their corresponding resource endowments (high potential vs. low potential).

d) Change in the Role of Extension

The fact that rural people also engage in technology development was greatly ignored. Likewise, the internal dynamic process of knowledge generation, exchange and dissemination going on in rural societies were missed. Of the many resources for the poor performance of the agriculture sectors in Nepal, this is in deed, a remarkable one. With this realization, agricultural development practitioners in Nepal have already begun to ask extension to enlarge the role into a facilitating one, so that it can coordinate and facilitate the farmers and other stakeholders towards development.

e) Rural Problems and Agricultural Development

Rural problems are complex, interrelated and multidimensional. Farmers often become hesitant to articulate these problems clearly to outsiders. The design and delivery of effective programs requires a good diagnosis of rural problems within the general framework of agricultural development. Problem analysis is the diagnostic part of the whole agricultural development process. Besides this, our experiences have repeatedly shown that farmers need to own “problems” and “activities” meant for them if they are to be sustainable. Problem analysis is a great challenge for extensionists. The basic need at present is to diagnose the problems, interest and concerns of the farmers and translate those into extension programs. For this, extension should tap farmers’ resources and increasingly utilize the rural people’s knowledge (indigenous knowledge) to plan and implement agricultural development programs, taking such indigenous knowledge as the starting point and building upon it.

f) Improvement in Technical Support and Input Supply System

It is seen that extension service with out the support for input supply services would not be valued much by farmers. That is why this responsibility needs to be entrusted fully to the private sector. Government

is now initiating this approach either through private organizations or companies or farmers groups / farmer's cooperatives.

g) Adopting a Pragmatic Approach

Many people complain that production-focused technologies have not taken hold in Nepal. However, particularly in terai region, increased use of modern seed varieties, chemical fertilizers, and pesticides certainly suggest that they had some impact. However, capacity building of farmers to access external information, to take sound decisions and to improve their socio-economic conditions is of extreme importance. This is a great task for extension that pragmatic approaches and methods are to be developed and used. Efforts should be made to promote a lateral transfer of knowledge and skills among the farmers.

h) Promote Marketing Extension

Rural economy in Nepal is in transition from subsistence to market oriented production. An extension marketing information program can help change farmers perspective as to the type of crops to be produced, enterprises to be taken up, postharvest practices to be followed, and the quality of goods to be produced. In this connection, extension has an important role to play for access to market information and identifying marketable products by farmers.

i) Gender Issues

In Nepal, women farmers have a greater contribution to agricultural practices than men. But their level of knowledge and skills are less than the male farmers. In order to raise female farmers' level of knowledge and skills, there is a need to involve them in key positions on farmers' groups, in training and exposure creating activities. Furthermore, the male farmers need to be oriented and reoriented towards the importance of female farmers in the programs.

j) Environment Concern

The role of agricultural extension has to also focus towards environmental protection .The depletion of the agricultural resources base as a result of its overuse and misuse has been a major problem, more particularly in hilly areas. Extension should, therefore promote sustainable land use alternatives and environmentally friendly technologies. Farmers need to be made aware of sustainable land use alternatives to address environmental concerns.

It is also suggested that all the agencies involved in extension system should have very strong communication and linkage mechanism as depicted at Annexure IV.

REFERENCES

Draft Final Report for CADP, Nepal By ANZDEC Limited.

Extension In Transition: National Extension Strategy By strategy task force, MOAC Nepal

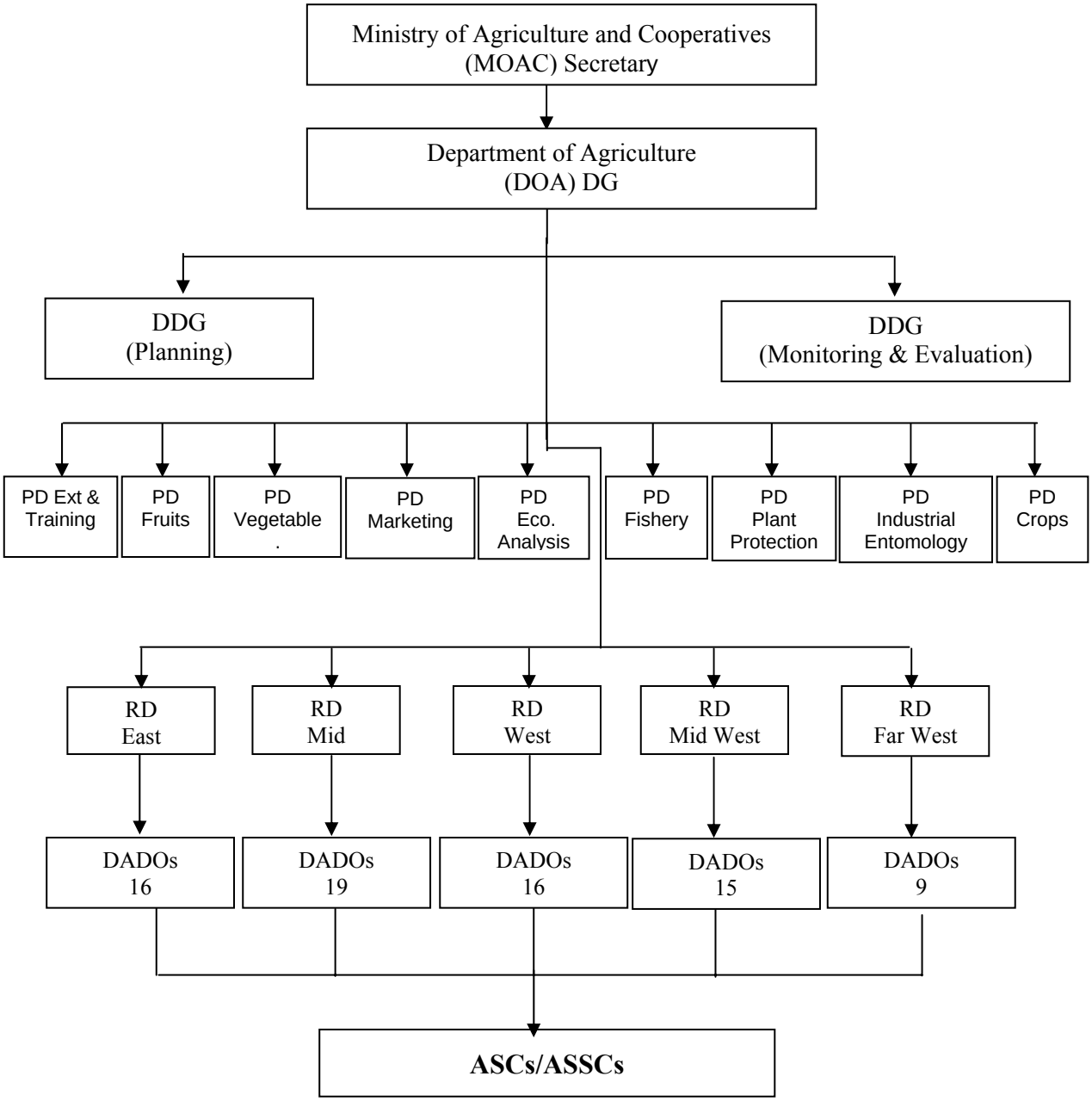
Formulation of an Extension strategy and its implementation in Nepal (final Draft Report), By FAO Team

*Extension Methods and Approaches For IPNS With Special References to FFS (*a resource paper), By SS Shrestha, Nepal

Guidelines And Process For Improving Support To Fgs - a working paper by AREP PCU/TA team, Nepal

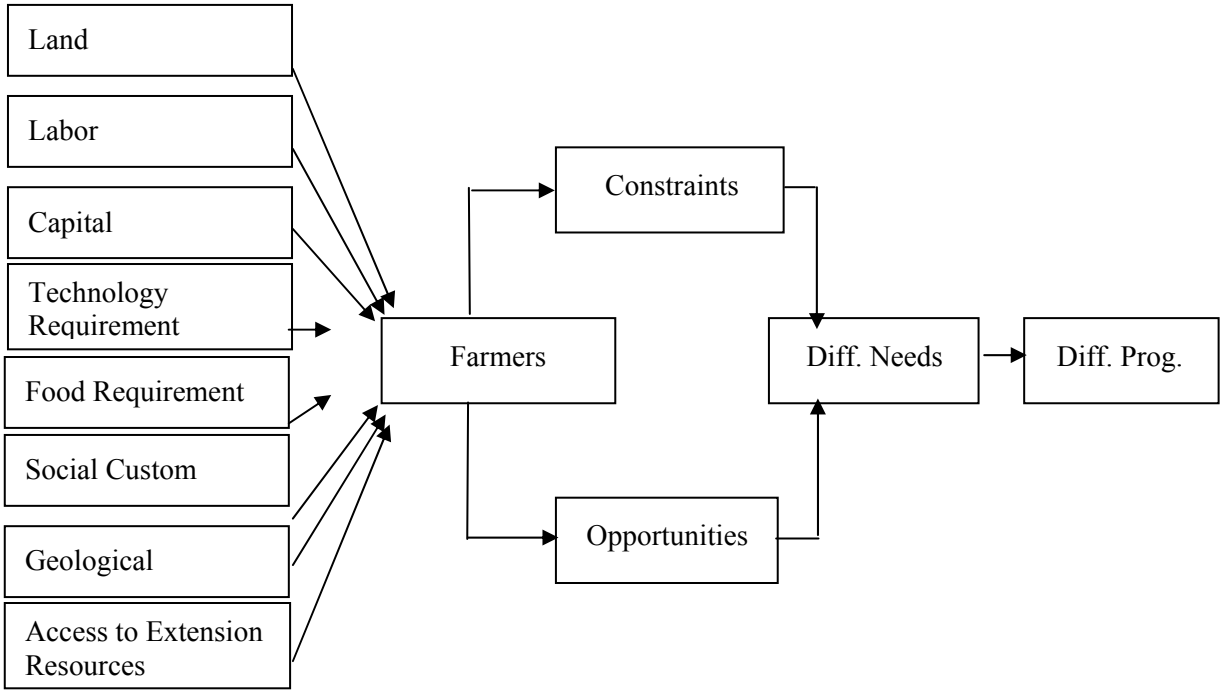
Annexure I

Organizational Chart of Agriculture



Annexure II

Different Programs with respect to Different Farmers

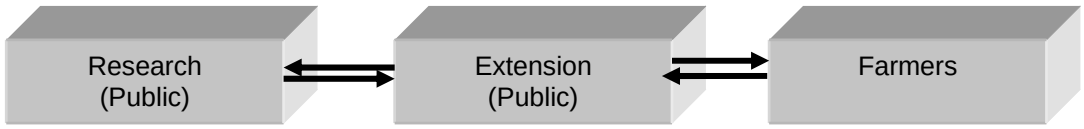


Annexure III

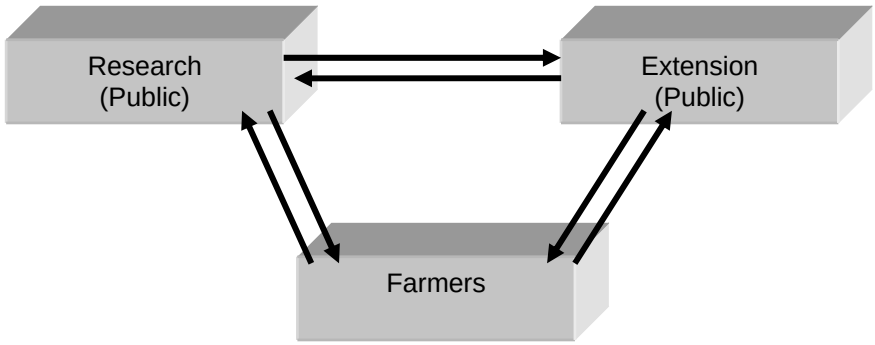
Coordination and Linkage

1. Old Model

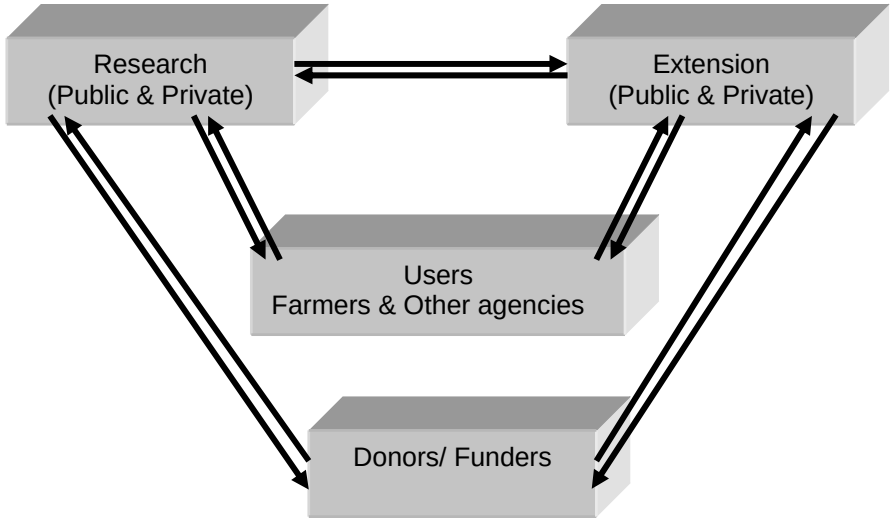
   ❖ Linear:



   ❖ Triangular

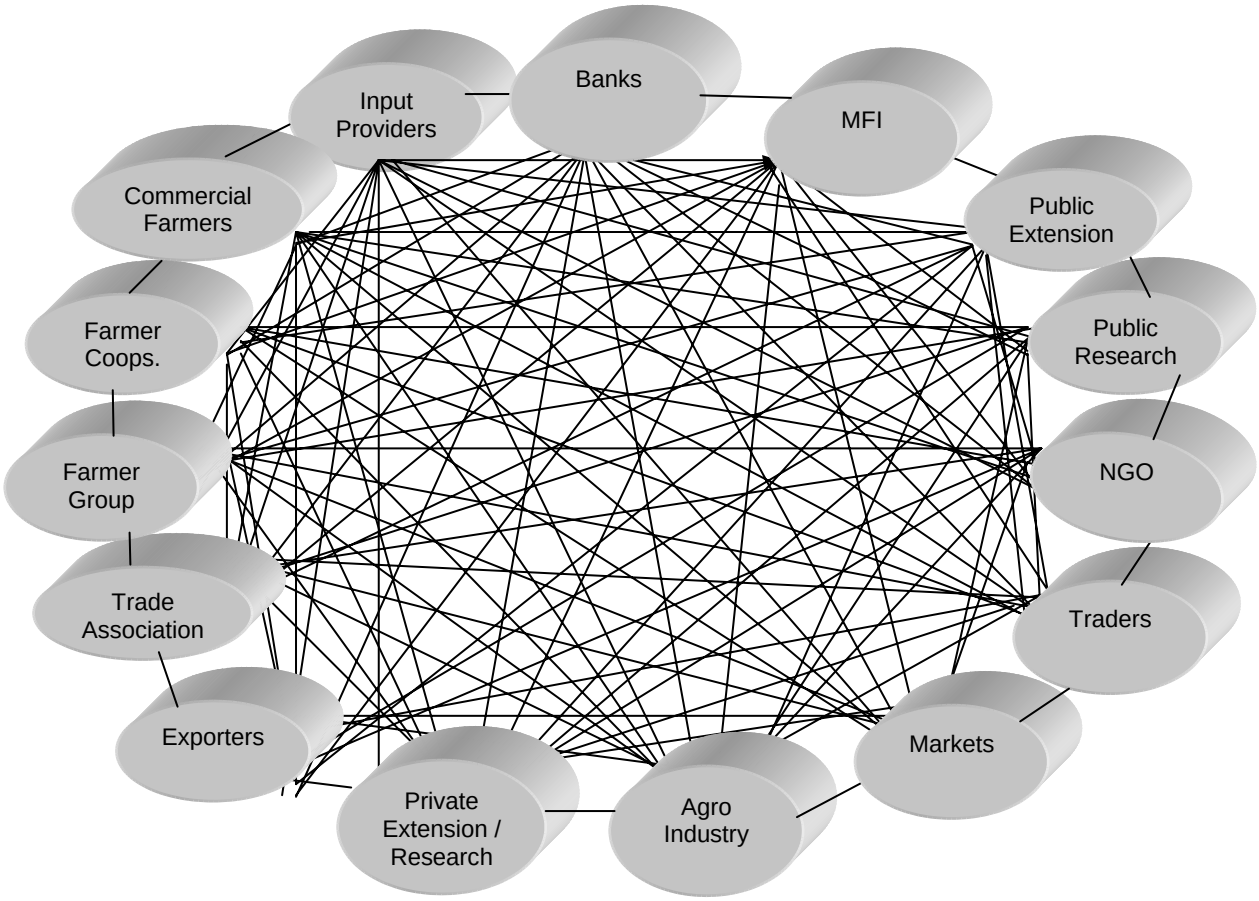


2. Pluralistic Model



Annexure IV

A Modern Linkage Network of Stakeholders



9. PAKISTAN

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INTRODUCTION

Agricultural Extension work started in the Indian sub-continent in 1902 with the establishment of Department of Agriculture, Punjab (Shami, 1963). In order to meet the emerging demands of trained manpower in agriculture, Punjab Agricultural College and Research Institute, Lyallpur (presently Faisalabad) came into existence in 1909 (University of Agriculture, Faisalabad, 2003). This gave a new impetus to agricultural development in the region, which is presently regarded as the breadbasket of Pakistan. This was the first major institution of higher education in agriculture in Pakistan.

In the early stages, all the three components (education, research, and extension) were so closely integrated that the Professor of Agriculture at the Punjab Agricultural College and Research Institute, Lyallpur used to work as Deputy Director of Agriculture (DDA) as well. In this way, he was also responsible for supervising agricultural development and extension activities in addition to his teaching and research responsibilities.

The main extension activities at that time included the establishment of district demonstration-cum-seed multiplication farms, which were setup in all districts. In addition, during the 1920s, village uplift (Dehat Sudhar) program was initiated under the supervision of F.L.Brayne who was the then deputy commissioner of Gujrat district in the Punjab, India. The program mainly aimed at improving village life as a whole with special emphasis on farming through dissemination of improved farm practices among farmers. The extension techniques employed for this purpose included stage drama, skits, role-playing, popular songs, slogans, posters and personal influence ((Mezirow, 1963). Brayne's program could not achieve lasting success: it was successful as long as he was there but collapsed soon after his transfer from the district.

In Pakistan, extension work has been in progress since the country's independence (1947). However, at that time the extension department did not have its independent identity; extension work was undertaken under the shadow of different community development programs. It was the time when community development work was gaining much popularity in the developing world. A number of community development programs were launched with the help of the US foreign economic assistance agency (later USAID) and UN agencies. The major program assisted by the U.S.A. was first established in India (1952) and later on similar program was established in Pakistan in 1953. The US spent a huge amount of $50 million in launching such programs in 30 countries. However, almost 50% of that amount was earmarked for India, Pakistan, and the Philippines.

Somewhat lesser amount was spent by other agencies like United Nations and the World Bank. The World Bank financing of such programs did all other donors combined, thus giving the Bank major influence over public extension systems in developing countries, provide more than that. The World Bank support to developing countries recognized the importance of extension and shaped development of many national extension systems (Gustafson, 1994).

After independence, the Government of Pakistan appointed a National Commission on Food and Agriculture and one on education with the terms of reference to review the agrarian system of that time and to develop recommendations for developing the full potential of agricultural resources. The commission made a strong plea for establishing an agricultural university, which could play a more vital role in

promoting research and education in agriculture. On the recommendations of this commission, the University of Agriculture, Faisalabad **(**UAF) was established by upgrading the former Punjab Agricultural College and Research Institute, Lyallpur during the year 1961-62 (UAF, 2003).

In Pakistan, the first effort of Agricultural Extension was undertaken in the form of Village Agricultural and Industrial Development -1952-61 (Village AID**)** program in the early 1950s. It was a multipurpose program; the main objectives were to raise rural income through improved farming and cottage industries, to create a spirit of self help, initiative, and cooperation among rural people and to provide the rural areas with the needed community services (Waseem, 1982). The program was initiated with great enthusiasm and a tremendous hope for the rural population. The village level workers were given training in the fields of agriculture, animal husbandry, and other areas of social work to perform their job and improve their livelihood.

Initially, the program gained much popularity among the villagers and also met with some success particularly with regard to the creation of consciousness among the rural masses about self-help and self-reliance to solve their problems, but later on it could not maintain its standard due to non-cooperation of other allied departments. It was due to this reason that other departments realized that a newly emerged program was taking all the credit of development at their expense; thus they became jealous of extension programs.

The village level workers limited their efforts to village elites only, ignoring the rural poor. Therefore, the village elites benefited from the program at the expense of the rural poor. Moreover, since the village level workers were newly appointed and were not professionally competent despite the fact that they were given training in various fields, they could not develop real local initiative and leadership. Due to the combined effect of these factors, this program was abolished in 1962. However, it was followed by other programs later under different titles but with the common goal of rural development. Important examples of these programs include The Basic Democracies System, Rural Works Program, Integrated Rural Development Program (IRDP), People Works Program and Taamir-i-Watan program.

Prior to 1961, agricultural education, research, extension and engineering activities were under the supervision of Director of Agriculture at West Pakistan level. An Independent department of agriculture (extension) came into existence in 1962 (Khan et.al., 1984).

Since then, it has been striving hard to play its due role in uplifting the living standards of the rural poor. Until 1978, a traditional system of agricultural extension was in operation in Pakistan. However, this traditional approach to extension had certain inherent weaknesses, which stood in the way of its effective functioning. Consequently, the system had little impact on production (Government of the Punjab, 1983). According to the Government of Pakistan (1978) major factors responsible for this situation included:

- No effective liaison between research and extension;
- Multifarious duties assigned to extension agents;
- Lack of extensive and regular field demonstration program;
- Too vast operational area to give satisfactory coverage;
- Unorganized and ineffective visits to farmers;
- Preferential treatment to big landowners;
- Lack of effective organizational structure and proper programming;
- Insufficient pre-service and in-service training facilities;
- No specific evaluation of work; and
- Unsatisfactory terms and conditions of service, concerning salaries, housing and mobility.

Recognizing these limitations in the extension service at that time, the Punjab province of Pakistan started a project assisted by the International development agency (IDA) based on the "Training and Visit" (T&V) system of agricultural extension in 1978. This system was launched on a trial basis in five purposely-selected districts (Ali, 1991). During 1987-88 this system was expanded to all the districts of the province. The T&V system demonstrated some strengths over the past traditional extension system but it had too many inherent weaknesses. There remained lack of frequent inflow of locally tested agricultural innovations. The same extension messages were communicated to farmers again and again which resulted in redundancy of extension messages and lack of interest of farmers in them. Lack of efficient monitoring system in the field extension work limited extension service to paper work only. The extension approach remained top-down, only male farmer oriented, and less efficient (Ali & Lodhi, 2002).

PRESENT STATUS OF AGRICULTURAL EXTENSION IN PAKISTAN

In the wake of the overall globalization process, the government of Pakistan implemented its "Devolution Plan" on August 14, 2001. This has resulted in decentralization of agricultural extension in

decision making from provincial headquarter level to the district level. This decentralization has yet not shown any considerable change in the efficiency of extension service. The extension still remains top-down and autocratic in decision-making. No consideration has yet been given to involve local farmers in planning extension activities and contributing budget share at district or sub-district level. A modified version of T&V system was implemented (Government of the Punjab, 1999). The present agricultural extension system run by the governmental department of agriculture in the Punjab province involves extension work through Extension Field Schools (EFS). The EFSs are the farmer training sessions conducted by agricultural extension workers called trainers in the villager's house or the farm of a selected contact farmer. EFSs were initially used for integrated pest management projects in Philippines and Indonesia (Qamar, 2002). This system has four main components.

1. Technology Package Development

There are adaptive research farms in various agro-ecological zones of the province. The technology packages are developed through the collaboration of researchers and extension managerial staff in joint meetings. These packages are given a written shape in the national language, Urdu. The scientific staff of the research institutes and adaptive research farms prepares the draft of the technology package. A committee comprising officers from research and extension approves the draft. The draft is then presented to the crop management group (CMG) by the Director General Agriculture (Extension & Adaptive Research) called as DGA (E&AR). The production technology package is rejected or approved by CMG meeting chaired by the Secretary or Minister of agriculture.

2. Training of Trainers (TOT)

After getting the technology package of an approved crop, the training of trainers starts. Resource persons from research wing train master trainers -- one master trainer from every district. These master trainers train the trainers in their respective districts. These trainers include Agriculture Officers (AOs), Deputy District Officers Agriculture (DDOAs) and the District Officer Agriculture (DOAs).

3. Training of Farmers

The extension workers (Agriculture officers) develop their schedules for the training of farmers of the area. This schedule is handed to the supervisory staff, district administration, and research specialists responsible for their monitoring. It is also brought to the knowledge of the farmers through local announcements. The agricultural officers (AOs) conduct farmers' training. Field assistants (FAs) help them arrange meetings. FAs are sent by AOs to the villages one day before the actual training day. They announce the purpose, procedures, place, and the time of training through public address systems available in local mosques. They also motivate farmers to attend the meetings. As extension messages are not demand driven, farmers' presence in such meetings remain very less. The phases of training and the portion of technology packages to be covered in every phase are decided ahead of time. Phases of training deal with different crops such as training for wheat crop; training for sugarcane; training for cotton crop etc. Typical schedule of farmer trainings is given below:

Training Schedule for Wheat Crop:

Phase	Time period	Subject matter to be covered
1.	Sept. 15 to Dec. 31	i) Land Preparation
		ii) Quality seed
		iii) Seed Treatment
		iv) Timely Sowing
		v) Weed Control
2.	Dec. 15 to Jan. 31	i) Weed Control
		ii) Balanced use of fertilizer
		iii) Irrigation at critical stage

4. Monitoring and Feedback

Various research specialists; members of district administration and administrative staff of the Department of Aquaculture (Extension) are assigned the duties to monitor the work of trainers. They receive the training schedule as soon as it is developed. Then, without telling or informing, they visit the village where the training has been scheduled. In case they find that an AO is not present and does not conduct a training session, they give feedback to the EDO of the concerned Director General Agriculture (Extension), Punjab, and the Secretary Agriculture, Government of the Punjab who is the boss of the Director General. The internal monitoring is conducted by DOAs and EDOs; whereas the external monitoring is done by the research specialists.

ISSUES FACING PAKISTAN AGRICULTURAL EXTENSION SYSTEM

Before the devolution plan, the Deputy Director Agriculture (Extension) worked at district level under the supervision of the director agriculture but this set up has been changed after the implementation of the devolution plan. The designation "Deputy Director agriculture" (DDA) has been changed to "District Officer Agriculture" (DOA) who is now responsible to the "executive district officer" (EDO) agriculture. The EDO is responsible to the "District coordination officer" (DCO) who is answerable to the elected district Nazim (Government of Pakistan, 2001). In this way effort has been made, theoretically, to decentralize the administrative setup and decision-making process of the department of agriculture (extension) along with other governmental departments. There is still a large administrative hierarchy in the department of agriculture (extension). The extension service still remains inefficient, top-down; bureaucratic, big farmer oriented ignoring the gender equality issue, and ignoring youth as partners. All approaches reviewed emphasized providing extension education services to men only.

AGRICULTURAL EXTENSION SYSTEM AND UNIVERSITY OF AGRICULTURE

In order to develop a sound and sustainable extension program, the University of Agriculture, Faisalabad (UAF) needs to have its own outreach area for extension work so as to use it as its laboratory for providing practical training to the students and extension field functionaries, in addition to evolving innovative extension models/ approaches to deal with present and future challenges in extension by undertaking research projects. During the time of old Punjab Agricultural College and Research Institute Lyallpur, the agricultural education, research and extension functions were closely integrated and the Professor of Agriculture use to work as the Deputy Director of Agriculture for extension work in the district in addition to his teaching and research assignments. The college was upgraded in 1961 to the university level and the agricultural education sub system was separated from the provincial agricultural research and extension programs. During the early 1980's Dr. Ghulam Rasul Chaudhry, the then Vice Chancellor of the University, started efforts to bring extension work of Faisalabad district under the umbrella of the University of Agriculture, Faisalabad for rendering expert extension services. The proposal was agreed in-principle by the then Governor of the Punjab. During 1993, the Minister of Agriculture, Government of the Punjab constituted a committee headed by Prof. Dr. Muhammad Rafiq Khan, the then Vice Chancellor, UAF to consider the transfer of the extension activities in Faisalabad district to the University of Agriculture, Faisalabad. Efforts were done from time to time, even during recent years, to acquire Faisalabad district from the Department of Agriculture (Extension), Government of the Punjab as an outreach area but these efforts could not materialized. Recently, the University has introduced the Internship program in its undergraduate classes. It has further necessitated the need of outreach area.

The University has a great challenge to design extension strategies and models, which should change the fate of the poor by providing the educational help to let them stand on their own foot and develop themselves. By strengthening its outreach program, the University will be able to provide strong practical based training to its students who are future researchers, teachers, managers, and extension workers in agriculture. It will respond quickly to the needs and problems of rural people for their immediate solutions.

The University will be in a better position to demonstrate how to build strong agricultural economy that will ensure ample supply of high quality food and fiber and will contribute in a better way to the economic and social well being of people around it. The faculty will have an extended opportunity to have real life learning. They will play leadership roles in managing and conserving natural resources particularly water, soil, forests, and wild life. They will have better opportunities to conduct meaningful research by focusing it on the feedback of workers in the outreach area. More and more female students are getting interested in higher education in agriculture, home economics, livestock management, poultry husbandry, natural resource management and allied disciplines. They also will need jobs. Therefore, there is a dire need to design a holistic, multidisciplinary, and participatory extension model of the University.

PROPOSED EXTENSION MODEL

1. Mission

The mission of the Proposed Extension Model will be to provide strong and practical based training to our students, who are future researchers and extension workers. We will provide research based non-formal educational programs that will bring life long learning opportunities to rural households of Faisalabad District. The Model will respond to the needs of rural people for solution to their problems. The main goal is to demonstrate how to build strong agricultural economy that will ensure an ample supply of

high quality food and fiber, and will contribute to the economic and social well being of all the residents of Pakistan.

2. Objectives

The extension activities proposed to be sponsored by the University of Agriculture, Faisalabad will be guided by the following specific objectives:

- To provide an opportunity to the faculty and students for a real life learning living and working with farmers and learning how to solve real problems. Curricula will be revised according to the changing needs and problems of farmers.
- To disseminate research based information and skills to farmers and rural people of Faisalabad District related to agriculture, livestock, natural resource management, home-economics, and allied disciplines.
- To develop extension model that should promote a profitable and productive agricultural sector through increased economic growth and food production in the district.
- To take leadership role in managing and conserving natural resources particularly water, soil, forests and wildlife in Faisalabad District.
- To contribute to improving the quality of life for farmers, farm families and rural communities by helping them enhance family income and educating them to be wiser consumers.
- To ensure through coordination the adequate and timely supply of agricultural inputs and credit to farmers, particularly to small and medium farmers, at their door steps.
- To develop linkages within the University and outside of it by coordinating and linking University faculty and students with the nation building departments (NBDs) in the district.
- To make the University research more meaningful by focusing it on the feedback of extension activities of the University.
- To create viable local institutions by helping establish rural youth and rural women organizations by involving them in socio economic development.

3. Agricultural Extension Strategy

The major strategy for achieving the said objectives, is proposed to be based, on following points:

- Frequent training of the field staff and students in extension; and encouraging volunteers (students as well as local people) as extension workers.
- Recognizing rural men, women, and youth as our extension clientele.
- Identifying critical problems of households and specific educational needs of our target groups (clients) by exchanging views with farmers, researchers, agricultural business people, and consumers.
- Developing extension programs which will respond quickly and directly to the critical problems.
- Encouraging faculty specialization and new research where needed and focusing all research efforts on field problems.
- Developing stronger relationship with agricultural industries, nation building departments, input agencies such as pesticide companies and farm organizations to share information, sponsor joint educational programs and eliminate unnecessary duplication of efforts.
- Monitoring and evaluating continuously our research and extension efforts
- Making modifications for better outcomes.
- Strengthening and ragogical (science of teaching adults) research to identify and overcome the hurdles in the speedy diffusion of agricultural innovations.

4. Implementation Plan

The vice-chancellor, University of Agriculture, Faisalabad is proposed to be chief Executive of the Agricultural Extension Service, UAF in Faisalabad district. The Director, Division of Education and Extension (DEE) will act as the chief coordinator for bringing coordination and collaboration between university experts and the field extension staff. The Dean of the faculty will also act as Dean for Extension (DE) pertaining to the extension activities of his faculty. Each Dean will nominate one faculty coordinator (FC) and some (number to be decided by each Dean) Subject Matter Extension Specialist (SMESs) such as Extension Agronomist, Extension Horticulturist, Extension Entomologists, Extension Home Economist etc. etc. from his faculty / Division. Each SMES will represent specific discipline. The FCS will maintain coordination with respective Dean, SMESs and the DEE.

REFERENCES

Ali, T. (1991). *An Identification And Validation Of Job Performance Competencies Needed By Agricultural Extension Field Assistants In Faisalabad District*, Punjab, Pakistan. Unpublished doctoral dissertation, University of Minnesota, USA.

Ali, T. & Lodhi, T.E. (2002). *Perceptions Of Farmers And Their Representatives Regarding The Efficacy Of Social Organizer Working For PRSP In Faisalabad Region*. In (Pakistan Association for the Advancement of Science) Abstract published in 33rd All Pakistan Science Conference, University of Agriculture, Faisalabad, 25th to 28th December (P.77). Lahore: Pakistan Association for the Advancement of Science.

Asian Development Bank (2003). *Website ADB.org updated on Monday* (February 10, 2003).

Boone, E.J. (1989). *Philosophical Foundations Of Extension*. In D.J. Blackburn (Ed.). Foundations and Changing Practices in Extension. Ontario, Canada: University of Guelph.

Government of the Punjab (1978). *Punjab Extension And Agricultural Development Project*. Lahore, Pakistan: Policy and program farming cell, Agricultural department.

Government of the Punjab (1983). *Punjab Extension And Agricultural Development Project*. PC-1 Form. Directorate General Agriculture (Extension & Adaptive Research) Punjab, Lahore.

Government of the Punjab (1999). *Farmer Training Program For Enhancement Of Wheat Production.* Notified no. 187-D / Ps. Ext, Agri/99, Agriculture Department, Lahore, Pakistan.

Government of Pakistan . (2001). *Agricultural Statistics Of Pakistan*. Islamabad: Ministry of food, agriculture and livestock. Food agriculture and livestock division (Economic Wing).

Govt. of Pakistan. (2002). *Economic Survey 2001-2002*. Ministry of Finance, Economic Affairs Division, Islamabad

Govt. of Pakistan. (2003). *Economic Survey 2002-2003*. Ministry of Finance, Economic Affairs Division, Islamabad

Gustafson, D. (1994). *Developing Sustainable Institutions: Lessons From Cross-Case Analysis Of 24 Agricultural Extension Programs*. In Public Administration and Development, 14, 121-134.

Khan, M.J., Sharif, M. &Sarwar, M. (1984). *Monitoring And Evaluation Of T&V System Of Agricultural Extension In The Punjab, Pakistan*. Lahore, Pakistan: PERI.

Mezirow, J.D. (1963*). Dynamics Of Community Development*. New York: The scarecrow press, Inc.

Nuscheler, F. (2002). *Globalization: Is The South Losing Touch*? Adult Eructation and Development. 58:117-132.

Shami, M.A.A. (1963). *Agricultural education in West Pakistan*. Lyallpur (Faisalabad): WPAU, Lyallpur press.

Swanson, B.E. & Claar, J.B. (1984). *The History And Development Of Agricultural Extension.* In: Swanson, B.E. (Ed). Agricultural Extension: A reference manual. FAO, Rome, Italy.

Qamar, M.K. (2002). *Global trends in agricultural extension: Challenges facing Asia and the Pacific.* Paper presented at the FAO Regional Expert Consultation on Agricultural Extension, Research-Extension –Farmer interface and Technology transfer held in Bankok, 16-19 July 2002.

University of Agriculture, Faisalabad (2003). *Undergraduate Prospectus*. Faisalabad, Pakistan: UAF Press

Waseem, M. (1982). *Local Power Structure And The Relevance Of Rural Development Strategies*: A case study of Pakistan. Community Development Journal, 17(3), 225-233.

10. PHILIPPINES

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INTRODUCTION

A new approach to agricultural extension is needed to accommodate the latest developments and trends in agricultural in the country. However, it must emerge from an analysis of the success and failures of existing operations. In the Philippines, the growth and development of agricultural extension has always been associated with government re-organization. This paper discusses the historical background, status and trends, a new methodological tool, and salient issues and concerns of the agricultural extension systems.

HISTORICAL BACKGROUND

1. Spanish Regime

The beginning of agricultural extension service dates back to the Spanish era when the Spanish missionaries established the "Granjas Modelos" (model farms), which later on became the Settlement Farm Schools. Changes in cropping patterns in answer to market demands created an impact in the neighboring farms that became prototypes of "haciendas" due to the "encomienda" system that was later on institutionalized.

2. American Regime

In 1902, the Americans created the Bureau of Agriculture. A division for Demonstration and Extension Service was established under this Bureau in 1910. Five years later, the activities of this extension division were expanded to include cooperative farmers' associations, rural credit and animal insurance. In 1929, the Bureau of Plant Industry and the Bureau of Animal Industry were created. The Agricultural Extension Division remained with the Bureau of Plant Industry. In 1936, the Commonwealth Government enacted Commonwealth Act No. 85 which created the provincial agricultural extension service. This act provided for the appointment of Provincial Agricultural Extension Supervisors and Municipal Agricultural Inspectors.

PHILIPPINE REPUBLIC

In 1952, Republic Act. No. 680 created the Bureau of Agricultural Extension (BAEx) which integrated the agricultural extension services of the Department of Agriculture and Natural Resources (DANR). Upon recommendation of the Bell Mission in 1953, BAEx was given the mandate of implementing an agricultural extension program designed for farm management, home management and rural youth development.

In 1963, upon the enactment of Republic Act No. 3844, otherwise known as the Land Reform Code, BAEx was made into the Commission on Agricultural Productivity and placed under the Office of the President. The promotion and development of agricultural cooperatives was intensified while the programs, projects and activities of the Commission were realigned to support the agricultural land reform program.

In 1967, Republic Act No. 5185, otherwise known as the Decentralisation Act, empowered the local government to undertake agricultural extension services. About 16 other government agencies were found doing agricultural extension service in view of the increased demand for such services brought about by the small-scale farming system in the land reform areas and the series of re-organizations.

In 1968, Executive Order No. 128 implementing the Decentralisation Act of 1967, rationalized the implementation of the Agricultural Extension Service.

1. The Period of Martial Law

In 1972, the Integrated Reorganisation Plan mandated by Presidential Decree No. 1 reverted the Commission on Agricultural Productivity to its original name- Bureau of Agricultural Extension, back to the DANR.

Gradually, the line bureaus established regional offices and Regional Directors were appointed. In 1974, Letter of Instruction Nos. 447 and 448 authorized the Ministers to delegate substantial powers/responsibilities to the Regional Directors. The Ministry of Agriculture was among the first to delegate such powers and responsibilities to the Ministry of Agriculture Regional Directors.

. In May 1980, Executive Order No. 595 transferred the Bureau of Cooperatives Development (BCOD) from the Ministry of Local Government and Community Development (MLGCD) to the Ministry of Agriculture. This mandated the Ministry to strengthen community-based organizations for agricultural cooperation toward programs on savings and reinvestments to complement income-generating projects. Agricultural extension service was called upon to transfer appropriate technology for farming systems; accelerate institutional development and put in massive efforts on human resource development.

2. Post-Martial Law Regime

On June 30, 1984, Executive Order No. 967 renamed the Ministry of Agriculture into the Ministry of Agriculture and Food (MAF) and transferred the Bureau of Fisheries and Aquatic Resources (BFAR) from the Ministry of Natural Resources (MNR) to MAF. Accordingly, MAF was made responsible for the formulation of policies and goals for promoting the production of agricultural crops, livestock, poultry and fish through the implementation of appropriate programs and projects and the provision of suitable services for administration, research, regulation and extension.

3. Revolutionary Government under a Free Constitution

The staffing pattern as envisioned is not yet in place. There is, however, a re-alignment of services under five (5) Assistant Ministers and four (4) Deputy Ministers. The short-term recovery plan for the rural sector has been presented and approved and disseminated; while the agenda for action in agriculture has been drafted.

4. Devolution of Extension Services to Local Government Units (LGUs)

Time was when agricultural extension work in the Philippines was considered a professional and technical job. However, since the early 1990's with the devolution of the Bureau of Agricultural Extension into LGU Extension Service, agricultural extension in the Philippines became highly political at the cost of its professional and technical requirements. Hence, increasingly, the agricultural extension worker may not be hired because of his/her professional and technical qualification but on political affiliation or loyalty.

STATUS AND TRENDS OF AGRICULTURAL EXTENSION SYSTEM

Agricultural extension has been an evolving concept in the country's effort of agricultural development. Generally, an agriculturist was hired by the Department of Agriculture and assigned to the field to teach farmers new methods and practices of farming to increase farm production or to control pest and diseases -thus was considered as extension. With seeming good results, a Bureau of Agricultural Extension was created, not only to teach farmers new methods of farming but also for farm and home developments. This became the pattern of agricultural extension in the Philippines until it was devolved into the Local Government Units (LGUs).

More recently, some research and development institutions were mandated to do extension work such as Philippine Rice Research Institute (PhilRice), the Bureau of Post Harvest Research and Extension (BPHRE), and the Philippine Carabao Center (PCC). Extension means different things to different people.

As far as the human resource development people (agricultural education of people) are concerned, agricultural extension is a non-formal education of farmers, As far as the commodity production people are concerned, agricultural extension is technical assistance to commodity farmers and as far as the research people are concerned, agricultural extension is a "bridge between research and the farmers". The

agricultural economics people see agricultural extension as farm management education of farmers; hence in the 1970's the Agricultural Extension Workers were given the name of Farm Management Technicians (FMTs). For these reasons, several organizations and agencies conduct agricultural extension work in the Philippines.

So far agricultural extension in the Philippines is dominantly government provided and publicly funded. There is an increasing awareness of agricultural extension being conducted by NGOs but the scope of coverage and continuity has been extremely limited. In the Philippines, the most significant Non Government Organization (NGO) player in agricultural extension is the Philippine Business for Social Progress (PBSP). Agri-business companies are known to give information and advice to farmers but this is limited to their respective customers.

Until the year 2000, agricultural extension in the Philippines has never been assessed or evaluated. The general perception before the Philippine Institute of Development Studies (PIDS) comprehensive study of Agricultural Extension in the Philippines was that since devolution, agricultural extension has weakened, fragmented and not serving the farming population and the agricultural industry as required. But the PIDS initial findings shows that the extent of agricultural extension work has not significantly diminished and there is still big public funding for agricultural extension in the country.

MAJOR PLAYERS OF AGRICULTURAL EXTENSION SYSTEM

There are five major players in the agricultural extension systems of the Philippines. These are: a) bureaus and attached agencies of the Department of Agriculture, b) local government units (LGUs) of the Department of Interior and Local Government, c) state colleges and universities (SCUs) of the Commission on Higher Education, d) some non-governmental organizations (NGOs) and e) some private agri-business companies.

AGRICULTURAL EXTENSION USER SYSTEM

Records show that around 27 million Filipino farmers remain poor. About one-half of them live in the rural areas. The highest of poverty incidence is found among corn farmers (41%), rice and corn workers (36%), sugarcane farm workers, coconut farm workers forestry workers (33%) and fishermen (31%) (PCARRD 2003). About 10% are commercial farmers, while 70% are landless. The indigenous people represent about 18% of the Philippine population. Other users include, policy-makers, researchers, students, academicians, and institutions providing related agro-support services. The heterogeneity of extension users thus requires varied appropriate extension approaches.

EXTENSION WORKERS

This refers to the individuals initiating changes.

The country has about 32, 328 extension labor force. Among these players, the LGUs have the largest number of extension workers 25,000 (77%), DA has 3390 (10%), SCUs has 1250 (4%), NGOs has 2111 (7%) and private agribusiness companies 577 (2%), Table 1.

Table 1. Extension Labor Force in Philippines

EXTENSION PLAYERS	Number of Extension Personnel	Percentage
LGUs	25,000	77%
SCUs	1,250	4%
DA Bureaus and Attached Agencies	3,390	10%
NGOs	2,111	7%
Private Agribusiness Companies	577	2%
Total	32,328	100%

AGRICULTURAL EXTENSION AGENCIES

1. Department of Agriculture Bureaus and Attached Agencies

Out of the large number of bureaus and attached agencies of the Department of Agriculture, the PIDS study found that five bureaus, six commodity attached agencies and two Research and Development Institutes have strong agricultural extension mandate.

2. Agricultural State Colleges and Universities

In the year 2000, the Philippines had 13 Major State Universities and Colleges, and 19 Other State Colleges and Universities (SCUs). All these 32 SCUs have three chartered functions: teaching, research and extension. One of the comparative advantages of the SCUs in agricultural extension is its highly trained staff. However, the staff assignment system is very irregular compared to other organizations that have extension mandate. In the SCUs, it is difficult to know exactly how many of the staff is working in the area of extension because both the teaching and research staff are also expected to render extension function. Hence there are very few full time extension staff. It is estimated that no more than 1000 staff of SCUs are rendering the extension function.

3. Local Government Units (LGUs)

The devolved or decentralized agricultural extension services at the LGUs are the largest extension force of the country. LGUs control approximately 77 percent of the extension personnel of the country and around 65% of the extension budget. The extension force and budget are distributed to 78 provincial local governments, 84 chartered city local governments and approximately 1,525 municipality local governments. All these are supposed to provide a general agricultural extension service to farm people who reside and work in 41,940 barangays/villages. It is in the barangays, where the majority of approximately 12 million economically active populations in agriculture are working.

The obvious problems of the agricultural extension work by the LGUs are: a) the municipality and many small cities, as a unit of extension operation is too small while the extension work by the province is redundant of what is done by the municipalities, b) agricultural extension at the LGUs does not have up to date messages unless it is regularly linked and technically upgraded by the research establishment and the SCUs, c) politicizing the technical service to farmers and d) inadequate financial support from the poor municipalities.

4. Non-Government Organizations

NGOs are a relative newcomer to the agricultural extension arena. The earliest ones were church sponsored (Catholics and Protestants), and then the Philippine Business for Social Progress (PBSP), followed by foreign funded NGOs. Actually, the scope and coverage of NGO agricultural extension has been very limited. Except for the PBSP, the others have been small and short lived.

5. Private Agri-business Companies

Private agri-business companies had always been involved in extension work, particularly in subject matter areas and geographical areas of their business interest. The earliest and most common extension work of the private agri-business companies are: a) The municipality and many small cities are too small as a unit of extension operation, and the extension work done by the province is considered redundant distribution of information (labels, leaflets, posters, newsletters) of the inputs; b) distribution of samples of inputs they are promoting; c) putting up demonstration plots of their input products; and d) advisory service to their customer who need advice.

EXTENSION SERVICES PROVIDED

Major extension services provided by these institutions range from training services, farm or business advisory services, demonstration services, and information and communication support services. Table 2 presents the specific services provided. Of all the service providers, the educational dimension of extension, which is providing training, technical/advisory, information and communication support services, and development of training programs and support materials appears to be common.

Table 2. Extension Service Providers in the Philippine Agricultural Extension System

SERVICE	PROVIDER							
	DA-DTI & attached agencies	LGUs	Private sector/ NGO	SCUs	DAR	DOST	DENR	Others (TESDA, DTI, TLRC, etc)
Training (degree/non degree) for LGUs	x		x	x	x		Coastal Mgt.	x
Technical assistance/ advisory services	x		x	x				x
Extension cum research activities		x	x	x			x	
Information education support services	x		x	x	x	x		x
Social information		x		x		x		
Database on extension force of all providers	x							
Monitoring and evaluation of extension programs	x			x				
Delivery of direct agriculture extension		x						
Coordinate plans and programs and investments		x						x
Conduct public hearing		x						
Develop training programs and support materials	x			x				
Link to RDE programs		x	x			x		
Science and Technology Interventions						x		

METHODOLOGICAL TOOLS EMPLOYED FOR AGRICULTURAL EXTENSION

The Techno Gabay Program (The Technical Assistance Program)

1) Objectives

The Techno Gabay Program is being implemented to develop, validate and promote an effective mechanism for R and D utilization. Its specific objectives are:

- to develop a protocol for effective technology assessment and packaging;
- to integrate the technology management services currently being implemented;
- to institutionalize intellectual property management, incentives for successful technology commercialization efforts and capability building; and
- to provide an effective mechanism for planning, monitoring and evaluation of the Techno Gabay Program.

2) Guiding Principles

The Techno Gabay Program is guided by the following basic principles:

a) Bottom-up Delivery Process

Techno Gabay is participative, with the clientele viewed as the implementers, and the different government units as facilitators. It is welfare-oriented and underscores the need for effective delivery of interventions. The clientele are recognized as risk takers and the ones who assume much of the responsibility in ensuring the success of the program. This principle is differentiated from the top-

down delivery approach that is resource-based to encourage widespread participation of the clientele. This top-down orientation usually leads to dole-out mentally among the key players, with the government assuming the risks involved.

PCARRD and the regional R and D consortia present the concept of Techno Gabay and the minimum resource required to set up a Farmers Information Technology Services (FITS) centre to potential service providers and stakeholders. The potential host agency and other participating institutions within a specific area make the decisions as to the final form and configuration of the centre to suit their own local structures and mandates.

b) Networking

Networking is a system of linkages (Reyes, 2000). It addresses multiple areas of concern in which an area member is expected to contribute a particular service to the network to achieve a common goal. One of the sustainability features of the Techno Gabay Program is "networking". This is inherent in the Techno Gabay framework. The centre host agency of the FITS center establishes and maintains linkages with the a) various sources of information and technologies, and b) the different users of its services. It is directly linked with the regional R and D consortium through the Regional Technology Promotion Coordinator and other key government and non-government institutions within the region. It is by providing up-to-date and appropriate information and technology services that the FITS centre remains useful and relevant. This will ensure the continuous use of the FITS services by the clientele.

3) Techno Gabay at the Regional and Local Levels

The Technology Management Service is the core component of the Techno Gabay Program at the regional and local levels. It involves four major information and technology delivery modalities that complement one another to enhance R and D output utilization. These are implemented at the local level with the FITS or Techno Pinoy center as the nerve centre or the point of integration of the various activities. A Techno Pinoy center provides its information and technology services to the beneficiaries and other stakeholders of the program in partnership with other support service providers in a particular area.

***Technology Management Service Modalities of FITS are*:**

a. FITS' or Techno Pinoy is an information and technology service facility aimed at improving access of farmers, traders, processors, entrepreneurs and other stakeholders to information and technology in agriculture, forestry and natural resources. As provider of information service, FITS disseminates information, Education and Communication (IEC) materials in different formats such as print (primer, comics, leaflets, and bulletins), audio visual, broadcast and e-based media. A pool of experts may be tapped through the member agencies of the regional consortium, to render technical expertise. As provider of technology service, FITS responds to client needs through technology clinic, for training, linkage with support institutions such as credit and markets, technical assistance for enterprise development and sale of planting materials or animal stocks.
b. Farmer Scientist Bureau (FSB) or Magsasaka-Siyentista (MS) is composed of outstanding farmers selected on the merit of their successful application of S&T-based and indigenous technologies. These farmers are active participants, enablers, facilitators and initiators of technology transfer processes. The MS provides direct farmer-to-farmer advisory services to his peers within or outside his locality including local government units and farmer cooperatives or private organizations.
c. Information, Education and Communication (IEC) strategies are research- and need-based communication processes aimed at hastening adoption of technologies by FITS and FSB clientele. Techno Gabay utilizes appropriate IEC materials in print, audio-visual, broadcast and other electronic formats. The design of the IEC materials to cater to a particular group of clientele is determined initially through an information needs assessment of the intended users of the IEC materials.
d. ICT facilitates information flow and enables the service providers to respond quickly to meet the needs of the clients. This includes installation of the FITS databases and web interconnectivity with the PCARRD network and the regional consortium. Also, capability enhancement through trainings and hands-on tutorials are provided.

Each FITS center becomes the functional unit or structure of the program and is supported by a minimum of one MS selected within the same service area. Both the FITS and MS focus on the priority commodities of the centre. In addition to the FITS and the MS, the production of IEC materials by the Regional Applied Communication Office of the regional consortia has been redirected to support the priority commodities of the FITS. To further enhance the services being provided in each FITS, ICT databases have been developed by PCARRD and installed at the centers. The content build up of these databases in the various FITS centers is now being undertaken.

In order to orchestrate the integration of the FITS, MS, IEC and ICT components at the regional level, a Regional Technology Promotion Coordinator (RTPC) in each region has been designated under the Office of the Consortium Director.

The Techno Gabay Program is currently operating in the 14 regional consortia with a network of 93 active FITS centers and 70 MSs (Table 3). As shown in Table 4, out of the 93 FITS centers, 56 or 60% are LGU-based (provincial, municipal, barangay and city), while 19 or 21% are DA-based, 10 or 11% are SCU-based, 4 or 4% are DOST- based, 3 or 3% are NGO-based and 1 or 1% is DENR based.

Table 3. FITS Centers and MS by Consortium

Consortia	Number of FITS Centers	Number of MS
HARRDEC	9	7
ILARRDEC	8	7
CVARRD	21	13
CLARRDEC	15	3
STARRDEC	6	3
BCARRD	3	5
WESVARRDEC	3	3
CV-CIRRD	4	3
VICARP	5	5
WESMARRDEC	6	2
NOMCARRD	3	3
SMARRDEC	5	8
CEMARRDEC	2	5
C-CARRD	3	3
Total	93	70

Table 4. Active FITS Centers by Lead Agency

Lead Agency	Number	%
LGU	56	60
NGO	3	3
SCU	10	11
DA	19	21
DOST	4	4
DENR	1	1
Total	93	100 %

4) Strengths, Weaknesses, Opportunities and Threats (SWOT) of the FITS Centers

The Regional Technology Promotion Coordinators of the 14 regional R and D consortia performed SWOT analysis of the FITS centers in Region II in February 2002. The Coordinators identify the major strengths of the centers as follows:

a) Techno Gabay matches with the mandate and institutional structures of the host agencies;
b) Immediate hands-on training of technologies through the MS or on-site techno demo area; and
c) Specialist and technicians of the local government units readily available to provide technical assistance to the clientele.

Some of the opportunities noted include the:

a) Potential for expansion of the services to other livelihood projects and thus generate employment in the local area, and
b) Ability to attract strong support from the local officials and their constituents because of the relevance of the services provided.

MAJOR ISSUES AND CONCERNS OF AGRICULTURAL EXTENSION IN THE PHILIPPINES AND THEIR POSSIBLE SOLUTIONS

Given the history and current situation and less than solid effectiveness of agricultural extension in the Philippines, the major problems of Agricultural Extension in the Philippines is the lack of a coherent national policy on agricultural extension that embodies and guides all the agricultural extension efforts within the country by the different organizations and agencies of four departments of government, (i.e. the Department of Agriculture, Agrarian Reform, Education, Interior and Local Governments), the private sector and the non-governmental organizations. As a consequence 10 interrelated problems can be easily recognized, namely:

i. A multi-billion pesos effort of the Philippine government to support the knowledge and technology needs of around 12 million Filipino farm people, involving between 35,000 to 40,000 central and local government employees, has nobody to account for its operations, achievements, failures and impact or lack of it. Without the PIDS Comprehensive Study of Agricultural Extension in the Philippines, very little was known of this sleeping giant for accelerated, modernized agricultural and rural development.
ii. Experts and professional authorities in agricultural extension are not used in policy making, planning, organizing, implementing and evaluating the extension function in the country.
iii. Evidently, there is no national policy and coordination mechanism as far as the functioning of the agricultural extension in the Philippines is concerned. Agriculture and Fishery Modernisation Act (AFMA) of 1997, has provided for an Agricultural and Fisheries Research and Extension Coordination Council, but so far its presence in the extension sector is not felt at all. What is needed is a dedicated national policy and coordination mechanism of Agricultural Extension in the country that sets out policies and coordinates implementation of the mandated extension work of the DA Bureaus and Attached Agencies, DARs Extension work with the agrarian reform beneficiaries, the SCUs of the Commission on Higher Education, the Extension work of the LGUs of the Department of Interior and Local Government, the private agri-business companies and the non-government organizations wherever and whenever they take the function of extension.
iv. Fiscal support is problematic in general and weak and uneven among the different agencies of government.
v. Isolation and poor complementation, partnership and cooperation between DA agencies with research and extension functions and the LGUs which are conducting general agricultural extension in 41,940 barangays of the country with around 12 million people.
vi. LGUs at the Municipal level are too small as operational units of extension or have separate provincial and municipal operational units of extension.
vii. Lack of coherent personnel and fiscal policy for Agricultural Extension in the entire country.
viii. Lack of weak leadership for the extension function in most government agencies doing extension work.
ix. Common perception that agricultural extension is weak and not creating the expected impact on the productivity of farmers and of agriculture in general.
x. Poor image of the Agricultural Extension services in the Philippines due to the above problems and lack of objective monitoring, evaluation and reporting of the activities and achievements of agricultural extension.

The key solution to these interrelated problems of Philippine Agricultural Extension is a legislation that will put into the law of the land the PLURALISTIC POLICY of Agricultural Extension in the Philippines making extension in the Philippines as a PLURALISTIC AGRICULTURAL EXTENSION SYSTEM. That legislation should address and provide among other things, the following:

1. Establish a Policy and Coordinating Body of the Pluralist Agricultural Extension System of the country;
2. Provides funding at the national and local levels;
3. That the general agricultural extension program for farmers at the countryside should be a partnership and a cooperative responsibility of the Department of Agriculture and the Local Government Units. A formula of sharing the cost of operating the extension service between the DA and LGUs should be studied, decided and provided for in the law;
4. While the Local Government code does not provide for an appropriate local government unit as the Operational Unit of the general agricultural extension service, this law must pinpoint the Province as the appropriate and optimum level for an efficient agricultural extension Operation Unit;

5. That each operational unit of general agricultural extension should have an Agricultural Extension Center where: a) assessment of technology for location specific adaptability and farmers problems are undertaken (as a linkage point with research), b) training on new technologies are given to extension workers and farmer leaders from the municipality level can be given regularly, and c) dissemination and spread of knowledge and information to the municipalities and barangays are planned and carried out;
6. The law should provide for a Personnel and Fiscal policy framework for agricultural extension at different institutional bases; and
7. It should make provision for a mandatory process and impact monitoring and evaluation of extension work at every Operational Unit of the system or for every institution, Bureau, Specialised Commodity Agency Extension Unit/program.

CONCLUSION

Agricultural Extension in the Philippines is provided to different kinds of farmers by many agencies of the government and by the private Agri-business companies and some NGOs. The exact size and scope of the agricultural extension work in the Philippines is not yet fully known, but the initial findings of the PIDS indicates that in the government sector alone, more than 6 billion pesos is budgeted for agricultural extension at the LGUs, DA, DAR, and Commission on Higher Education, annually and is employing as much as 35,000 to 36,000 people with training in agriculture and administration. If properly managed, this is a fairly big investment for the non-formal education of Filipino farmer to enhance science and technology in farming and to increase their productivity, efficiency and income. But this de facto pluralistic character of the Philippine Agricultural Extension can be embodied by a formal Pluralistic Policy on Extension, making the seemingly unrelated agricultural extension work into a coherent and cohesive Pluralistic Agricultural Extension System in the Philippines.

REFERENCES

ATI-DA. June (2003): *The National Pluralistic Extension Agenda and Programs for Modernizing Philippine Agriculture:2003-2008*. The Agricultural Training Institute (ATI), BAEX Bldg. Elliptical Road, Diliman, Quezon City, Philippines

Contado, Tito E. (March 2003): *Agricultural Extension in the Philippines: Status, Problems and Strengths for Effective Technology Transfer. A paper prepared for the meeting of Division IV, Agriculture and Forestry Division of the National Research Council of the Philippines,* at the Ecosystems Research Development Bureau Auditorium, College of Forestry Campus, UP Los Baños, Laguna, Philippines.

Contado, Tito E. January (2003): *Agricultural Extension in the Philippine- Strategies. A paper presented for the First Philippine Corn Annual Symposium and Planning* Workshop held at Monte Vista Resort, Pansol, Calamba, Laguna, Philippines.

PCARRD. (2003): *R & D status and directions (200 and beyond). Applied Rural Sociology Team, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development* – Department of Science and Technology (PCARRD-DOST), Philippines

PHILARM. (2003): *Research Management Component. 12th PHILARM Convention Proceedings.* Philippine Association of Research Managers, Inc. (PHILARM) in collaboration with the Bureau of Agricultural Research (BAR), UP Los Baños, College, Laguna, Philippines

Reyes, Jaine C. (2000): "*is There Anything New in the R & D Institutional Arrangement? A Cursory Review*". Research Management Components. UP Los Baños, College, Laguna, Philippines

Serrano, Segundo C. (1986): *Extension Delivery System: The Philippine Bureau of Agricultural Extension*. A paper presented during the CSSP Workshop on "Accelerating Technology Transfer in Small Farm Agriculture" SEARCA Auditorium, College, Laguna, Philippines.

Van den Bann, A. W., Hawkins H. S. (1996): *2nd edition. Agricultural Extension*. Blackwell Science Ltd. Berlin, Germany

11. SRI LANKA

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INTRODUCTION

1. Geographical Characteristics of Sri Lanka

Sri Lanka is a small island in the Indian Ocean situated at the southern tip of the Indian subcontinent within the equatorial belt. The country has a land area of 65,610 km^2 (6.56milion-ha-) of which approximately 2 million ha are arable lands. On the basis of the rainfall and soils the country has been divided into three major agro-ecological zones: Dry Zone with annual rainfall of <191 cm / year (4.17 million ha), Wet Zone with annual rainfall > 254 cm (1.54 million ha) and Intermediate Zone with rainfall between 191 cm and 254 cm (0.85 million ha) and these are further sub divided into 22 agro-ecological regions (Figure 1). According to the elevation, the island is divided into low country (from sea level to 300 meter above sea level), mid country (300-900 meter) and up country (over 900 meter). The soils of Sri Lanka have been surveyed at a reconnaissance level and mapped.

2. Socio-Economic Characteristics of Sri Lanka

The total population of the country was estimated 19.007 millions in 2002, of which about 70% live in the rural areas of the island. The rate of growth of population is 1.3 % which is lower than the rates in other developing countries in the region.

Agriculture has been the main stay of the Sri Lanka economy. In 2002, it accounted for 20.1% of the GDP and about 35% of the foreign exchange earnings. Its per capita GNP for 1995 was US$ 719 and it rose to US$ 858 in 2002. The agriculture sector provides most of the country's food requirements, raw materials for agro-based industries and employment to about 40% of the country's population. These contributions exceed the contributions of any other sector of the economy. An estimated 1.8 million families are engaged in farming. Small holders dominate Sri Lankan agriculture, as over 64 % of the farm families cultivate less than 0.8 ha of land.

It is an important indicator that 62.3% of total households have electricity facilities. Telephone density (fixed lines) is 4.7 per 100 persons and including cellular phones it is 9.5. 0.37% of the total population have internet and e-mail facilities. Overall literacy rate is 90.1% (male 92.5% and female 87.9%) and pupil/teacher ratio is 14.2.

In 1977 Sri Lanka adopted an open market policy, which focus on trade liberalization, export orientation and private sector participation in the development process. This policy change has brought about some desirable benefits as well as some negative economic and social implications.

DEVELOPMENT OF AGRICULTURAL EXTENSION

1. Ancient Period

Prior to the advent of the colonial regime, Sri Lanka had a long history on rice and subsidiary food crop based social system and spice crop based export economic system. This system survived for over 2000 years due to a unique institutional system, made up of many components and organized as a hierarchy. At the base was the village with a village council and a village chief. Villages were grouped in to larger divisions and the apex of this pyramid was the king. Well-developed irrigation schemes and traditional technologies indicate the evidence that an advanced civilization existed. Such civilized society was internally self-governed and agriculture was regulated by local customs and traditions. With the advent of the colonial regime, which drove towards the establishment of a centralized administration, the village based social system experienced drastic changes. Priority given was the plantation sector and the environmental friendly traditional agricultural systems were neglected. Later, it was realized by the government that food production should be considered as a priority area.

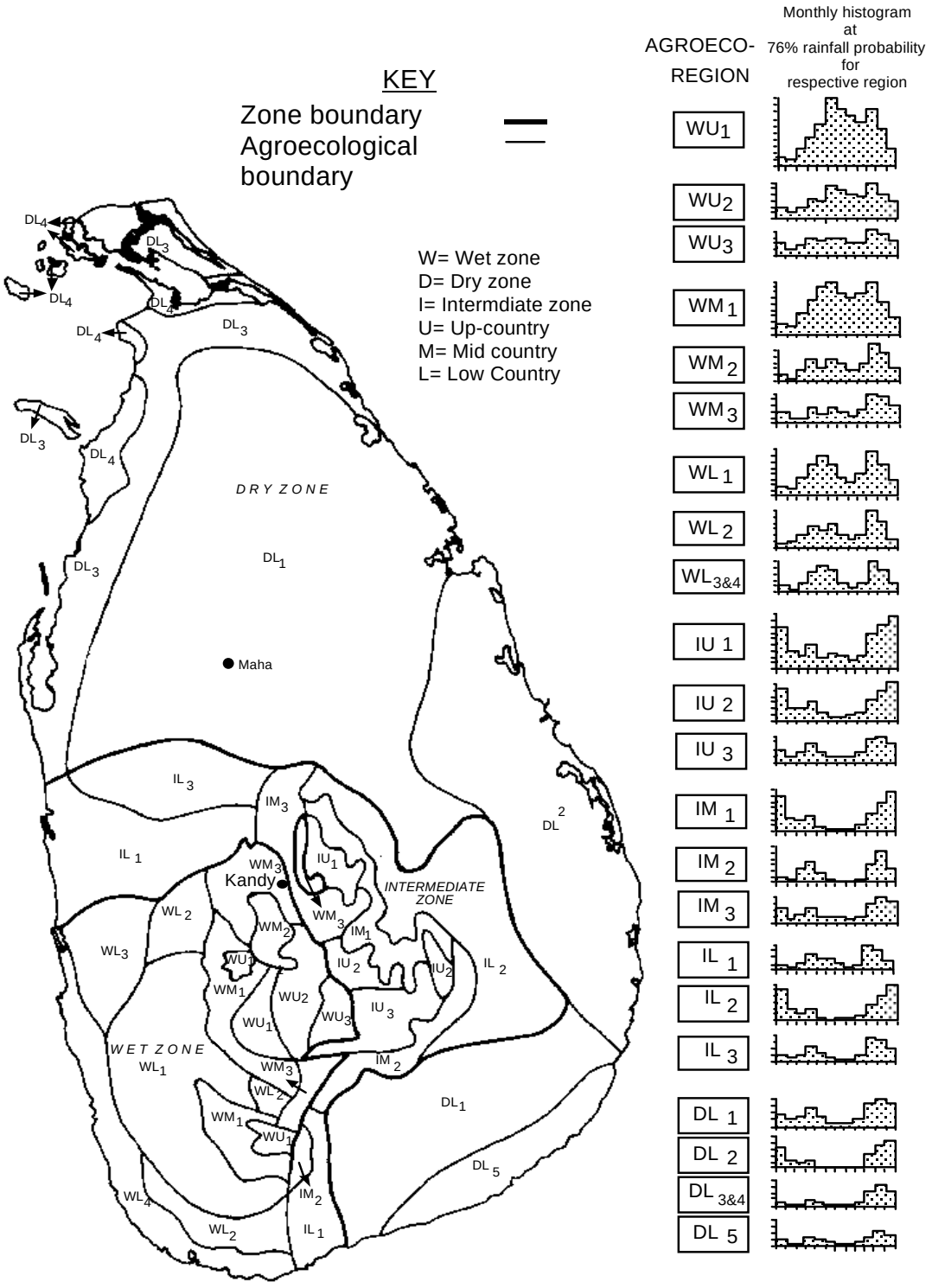

Figure 1. Agro-ecological Map of Sri Lanka

2. Independence Period

During the later part of 19th Century few Agriculture Instructors (AII) were appointed to work directly under Government Agents, who were responsible for increasing food production in the country. In 1904 Ceylon Agriculture Society was established with an attempt to resuscitate peasant agriculture. This society attempted to get to the native cultivators by means of the wealthier local landowners and planters, to pass on the experience and knowledge of agriculture possessed by the research staff. There after Ceylon Agriculture Society in association with the Government Agents, food production was formed. With the creation of the Department of Agriculture (DOA) in 1921 the staff of Ceylon Agriculture Society was

absorbed into DOA. Even after the creation of the DOA, emphasis of research and advisory work was directed to the plantation sector.

The country faced a severe food shortage in 1922, an aftermath of the first World War. By 1938, there were six Agriculture Divisions headed by Agriculture Officers and Agriculture Instructors were serving as the field level extension workers who came in direct contact with the farmers.

The outbreak of the Second World War followed by food shortages made the Government revise its agricultural development policies. The AII were released to the Assistant Government Agents of the Districts (GAA) to be engaged in food production.

3. Post Independence Period

Immediately after gaining independence the Government paid emphasis on rice production for which renovation or reconstruction of old irrigation tanks, settlement of peasants in colonization schemes were undertaken. In most of the major colonization schemes, the government opened up government farm to conduct research, produce seed and also to serve as the demonstration fields to colonists, to show the type of farming they should be following. The AIIs served as the field extension workers.

In 1952, food production was considered a high priority and a separate Department of Food Production (DFP) in the Ministry of Agriculture was created. The DFP was entrusted with the responsibility of coordinating the activities of all departments connected with the production of food thereby making DOA a second liner in food production. In 1957, The Department of Food Production was disbanded and the staff was absorbed into the DOA. About 500 Food Production Officers (FPO) came into the DOA and a new carder of FPO was created. Many FPOO did not have any agriculture qualifications.. The designation of FPO was later changed to *Krushikarma Vyaptha Sevaka* (KVS) and subsequent recruitment was from individuals who completed one year training course in practical farm schools. This led to the new cadre of Extension Officers below AI as direct contact with the farmers at the village level.

4. Agricultural Extension after 1956

The grade of District Agriculture Extension Officer (DAEO) of the DOA was created after abolishing Divisional Agriculture Officer (DAO) who were in-charge of a province (Sri Lanka has nine provinces). DAEO were appointed to each of the 22 administrative districts and they were asked to concentrate mainly on agriculture extension work. In 1963, a separate Division of Agriculture Extension was created in the DOA. Up to this, extension work concentrated on rice. After 1963, emphasis on crops like chilies, onions, potatoes and vegetables started.

Since then the Agriculture extension service kept to normal growth and increase in staff. The noteworthy development up to 1979 was the introduction of the "Annual Agriculture Implementation Programme Preparation". Agriculture Service Centers and Agriculture Productivity Committees were established in 1970. Agriculture Extension Centre, Bank, Fertilizer Stores, Agrarian Service Divisional Officers Office were housed in the same roof.

5. Training and Visit System of Agricultural Extension in Sri Lanka

The World Bank assisted Agriculture Extension and Adaptive Research Project (AE&ARP) was implemented in 1980. This brought in a major development of agriculture extension, improvement of research extension linkages, training of extension staff, increase of staff training centers and increase of extension staff at all levels. The main features of the project were:

a) The major intervention under T & V were: professional unified extension service covering all crops with a line of command from the head of the extension division of the DOA to village level extension worker;
b) It provided for regular fortnightly training of all AIIs and *KVSs* by Subject Matter Officers (SMO); and
c) It provided for pre –programmed visits to groups of farmers by *KVSs.*

Following are the positive results of the implementation of T&V system:

a) number of extension workers in the Department of Agriculture was increased;
b) coverage of all farmers without any bias big, small or poor by the extension service;
c) extension work programmed with extension targets and monitoring of the extension program;
d) appointment of Subject Matter Officers to train AII and KVSs on a fortnightly basis;
e) appointment of Subject Matter Specialists to conduct In-Service training of all extension staff and to serve as a link between research and extension;
f) creation of Regional Technical Working Group (RTWG) meeting with a clear function of identifying and allocating priorities in research, training of extension staff and extension program for the region;

g) creation of Adaptive Research Centers in each district to conduct adoptive research in farmers fields; and
h) conduction of monthly Research Extension and Training dialogues.

During the early stages of the T&V system it was observed that there was a significant impact on agricultural development. High yields of rice in major irrigation schemes, crop diversification in paddy fields and improved crop protection of rice were some of them. At the later stages there was some criticism leveled against the system. The policy makers had to pay attention to the following.

a) T&V system was too rigid a system such as fixed visit schedule to *KVSs* which could not be adhered to.
b) Contact farmers were not passing the information to the follower farmers.
c) Extension worker had to do non- extension functions.
d) Extension tools were too expensive and a large number of extension workers were required.
e) Use of mass media for extension was very low.
f) Emphasis on contact farmers neglected the natural groups in the farming community.
g) "Top down approach "instead of "bottom up" approach of extension.

6. Integrated Agricultural Extension Strategy, an Alternative for T&V System

With financial assistance of the World Bank, the Second Agricultural Extension Project (SAEP) was started in 1994 to strengthen the non- plantation extension system in the country. The strategy behind the SAEP was to identify and solve farmer constraints in a participatory partnership with farmer groups. Problem Censes Problem Solving (PCPS) technique was used to identify farmer constraints to develop a farmer based action plan. Extension system introduced under the SAEP was explained as an Integrated Agricultural Extension System (IAES) where four implementing agencies (Department of Export Agriculture, Department of animal Production and Health, Coconut Cultivation Board and DOA) were involved. At the provincial level the Provincial Extension Working Group (PET) was formed to coordinate the activities of implementing agencies and to review the integrated extension program. At the divisional level, the team (GET) was responsible to monitor the program where the field extension team (FET) members were responsible to prepare the farmer based extension plan at the village level. The main weaknesses in the use of PCPS for IAEP implementation were:

a) A limited understanding of the purpose of PCPS as a planning tool;
b) Use of a problem prioritization process, which restricts the number of farmer problems which are addressed;
c) A poor problem analysis process which does not identify core problems, leading to a weak problem solving activity;
d) Inadequate action planning with farmers to secure their commitment and to provide the basis for proper extension work planning;
e) Inadequate training, guidance, monitoring and evaluation; and
f) The retention of top down extension targets by the line agencies.

Several years of operation the experience under the SAEP showed that the collaborative work did not materialize the desired outcome due to the following reasons:

a) different agencies work under different ministries and each of them has its own mandate, responsibilities, targets and work plans; and
b) most of the time, the joint programs were shunned or at least given only a passive support by supervisory officers at various levels although the field level extension workers are involved actively in implementing various aspects of IAES.

7. Participatory Technology Development (PTD) as an Effective Extension Tool (A success story from the North Western Province of Sri Lanka)

The North Western Province Dry Zone Participatory Development Project was a cooperative effort between the Government of Sri Lanka, the International Fund for Agricultural Development (IFAD) and the Federal Republic of Germany. The project was started in 1993 and covered 13 administrative divisions in the province.

The main objective of the project was to stabilize and improve the income of the resource poor farmers through more appropriate and more sustainable management of natural resources. Rain fed upland and home gardening development program was one of the seven components of the project and has given a very high priority. The main characteristic of the project was it's focus on beneficiary participation in planning implementation, monitoring and evaluation of project activities. The methods applied in the

process of planning, implementing and monitoring were based upon adaptation of Participatory Rural Appraisal (PRA) combined with the concept of Social Mobilization.

The approach adapted in working with farmer groups was commonly described as "Participatory Technology Development" (PTD). Through the PTD, process farmers had an opportunity to discuss field problems with their field extension worker (Agricultural Instructor) and to develop a program to test alternative solutions for farming problems. The approach adopted to try PTD was called as "Seasonal Cycle", where five steps had to be followed by extension workers and farmers.

Step 1 : ***First seasonal meeting of village interest group on upland farming*:**
Village members and agricultural field staff analyze the situation in upland farming and discuss possible solutions. The members decide which innovation to test and establish a seasonal work plan for the activities agreed upon.

Step 2 : ***Inter- village Visit*:**
Interest group members conduct a trip to another village, where similar problems have been identified and where farmers have started the testing of promising solutions.

Step 3 : ***Second Meeting Of Village Interest Group*:**
The tests agreed upon in the first meeting are discussed in detail and a work plan for each test will be prepared.

Step 4 : ***Monitoring Visits*:**
The interest group and the agricultural field officers meet regularly throughout the cultivation season ; walking field to field they observe and discuss the tests implemented.

Step 5 : ***Evaluation Meeting*:**
After the harvest, the interest group meets to analyze and evaluate the results of the season and to draw conclusions for the continuation of activities in the next meeting.

As an effective approach, application of PTD in 500 project villages has shown very positive results. By conducting extension programs along in the field, it provided an opportunity for extension workers to concentrate their efforts towards a more sustainable rural development program. The Project training component was very effective and training programs were conducted to improve extension workers' knowledge and skills on application of PRA tools in the field. It has further improved their skills on group facilitation, communication, planning, monitoring and evaluation of extension programs.

CURRENT SITUATION OF AGRICULTURAL EXTENSION IN SRI LANKA

Currently, different organizations are involved in agricultural extension in Sri Lanka (Annexure I). Not only their mandate but also the system of extension differs from each other. The Department of Agriculture has a long experience in applying Integrated Pest Management (IPM) as an effective tool for rice extension. Tea, Rubber and Coconut Research Institutes have their own advisory services and provide information together with their subsidy schemes. In view of the growing trend for reducing investments for public extension services by the government, a significant contribution can be seen by the private sector to provide commercially oriented extension support services to medium and large scale agricultural enterprises. Under the 13th amendment to the constitution of the country in 1988, agricultural and livestock extension became devolved subjects and separate departments were formed under the Provincial Ministries of Agriculture. Central Department of Agriculture is responsible for extension activities in specially selected irrigation schemes called Inter Provincial Irrigation Areas. The extension activities in the Mahaweli scheme, the largest irrigation scheme in the country is totally handled by a separate organization called the Mahaweli Development Authority of Sri Lanka which is going to be restructured in the near future. Though these organizations have their own mandate, they had focused on a common goal of upliftment of the farming community. It is a common feature in the country that the extension service for small scale farmers is mainly handled by the government where the private sector is dominating in the supply of input services. In certain locations, some Non Governmental Organizations are playing an important role in agricultural development. All the government extension services together with the input supply are concentrated at the *Govjjana Kendraya* which has become the main development center where field level officers are stationed. With the introduction of the recent agricultural policy, government involvement will be minimized with respect to the inputs supply and most of the government owned farms are now being handed over to the private sector. Such policy implications may stimulate the government organizations to examine some key issues, which may be critical in the near future. In this changing situation, the following issues must be discussed in detail at different levels (from national to village) and strategies need to be formulated to overcome them:

i. What are the main objectives of extension conducted by different organizations?

ii. How wide will the public and private extension coverage be?
iii. As extension workers in different organizations, can we assess the extension demand properly ?
iv. What methods will best match extension delivery to beneficiaries ?
v. How can we coordinate various sources of extension ?
vi. Do we have effective approaches to improve research extension linkages?
vii. What are the considerations for conducting sound and effective human resources development programs in agricultural extension?
viii. How can we design demand driven extension programs?
ix. What tools are more effective for evaluation of extension programs?
x. Do we have proper extension indicators for evaluation?

CONSIDERATIONS FOR STRATEGY FORMULATION FOR ENHANCING AGRICULTURAL EXTENSION SYSTEMS IN SRI LANKA

The statement no: 14 of the National Policy on agriculture and livestock of Sri Lanka (2003-2010) accepts the situation that the agricultural and livestock service has become weak and it needs to be improved. For the enhancement of agricultural extension systems in the country, a number of avenues can be considered.

i. The existing extension organizations, with long experience on performing extension functions in the country should be provided room to make the necessary structural changes which may enable them to provide a better service. Such changes must be based on the recent agricultural policy statement. Under the proposal for structural re-adjustment of the Department of Agriculture, it is suggested that separate divisions for extension and human resource development be established, which are now operating as one division. The North Western Provincial Department of Agriculture has made some internal structural changes and established separate units for planning, monitoring and human resources development in agricultural extension.

ii. With the representation of different extension organizations, it is useful to establish an umbrella organization, which may act as an advisory body to support policy formulation at the national level. The current mechanism is not much organized to fulfill such requirements.

iii. Agricultural education, research and extension organizations, which are functioning in the country have highly qualified and experienced staff. It is very important to mobilize such services appropriately to achieve the development objectives.

iv. When the privatization policy is adapted, a rapid infrastructure development can be seen in the country. Such development may be an opportunity for introduction of new technology for enhancement of extension especially in rural areas. Cyber Extension is introduced on a pilot basis to improve knowledge of rural farmers. This may be an effective strategy to popularize agriculture among school children and youths.

v. Although the intensity of public sector contribution for extension is indicating a downward trend, the private sector is in the process of expanding their services even in rural areas. But still, the rural farmers are not willing to pay for extension as public sector extension is available free of charge. Taking into consideration the huge number of extension workers attached to different government organizations, strategies should be formulated to motivate and utilize them properly. Performance appraisal, which has been recently introduced by the Central Ministry of Agriculture, must be implemented without any bias.

vi. Improvement of research, extension and training linkages is an important issue to be taken into serious consideration. Currently, such linkages are limited to a seasonal forum called Provincial Technical Working Group (PTWG), which has a positive impact on the T&V system. The forum consists of higher level technical personnel of the Department of Agriculture and the Provincial Department of Agriculture in each province. This forum should be strengthened by identifying real field problems and come up with well designed action plans to solve such problems. An effective monitoring and evaluation mechanism should be a pre condition. North Western Provincial Department of Agriculture is now in the process of trying out this strategy.

CONCLUSION

Strengthening of agricultural extension systems in Sri Lanka is an urgent and important task to be taken into consideration. Not only policy makers, but also implementers have to rectify the real constraints which can be seen as limiting factors for quality service of extension organizations. Even though the government contribution for extension is showing a downward trend, the organizations involved in extension can take various steps to improve their working capacity. Specific extension approaches, proper human resources development programs, well designed monitoring and evaluation mechanisms, effective communication systems, better coordination among other organizations are some crucial factors that can improve the efficiency of available resources of most of the organizations. In a situation where a mixture of extension strategies and approaches are practiced, comprehensive analysis is needed to strengthen Extension system in Sri Lanka.

REFERENCES

T&V System (1981): *Agricultural Extension: The Training and Visit System*, Operational Note. 1981

Bertus. H, Katrien van 't Hooft and Wim Hiemstra . (2003). *Ancient Roots, New Shoots*. ETC/COMPAS

Bull, T.A (1996); *Extension Consultancy on Problem Census techniques*, Work Planning, Monitoring and Evaluation, November 1996.

CBSL (2002): *Central Bank of Sri Lanka*, Annual Report. 2002.

IAES (1994): *Integrated Agricultural Extension Strategy (IAES), Operational Procedures, S/L Second Agricultural extension Project*, Ministry of Agriculture, Lands and Forestry, Sri Lanka, October 1994.

Agricultural Extension (1977) :*Manual of Agricultural Extension Personnel*, Dep. of Agri. Sri Lanka. 1977.

FAO (1980): *Proceedings of the Workshop on Agricultural Extension Management*, 16th –17th July,1980. Dep. Of Agri., FAO/UNDP.

National Policy on Agriculture and Livestock (2003-2010), January 2003, Ministry of Agriculture and Livestock, Sri Lanka.

Annexure I

Agricultural Extension Organizations in Sri Lanka

Sector	Responsible Organization			Other Organizations
	Research	Extension	Training	
1. Plantation:				
Tea	TRI/ Universities	TRI	• TRI • Tea Small Holding Authority	
Rubber	RRI/ Universities	RRI	• RRI	
Coconut	CRI/ Universities	Coconut Cultivation Board	Coconut Cultivation Board	
Cashew	Cashew Research.Ins./ Universities	Cashew Dev. Board	Cashew Dev. Board	
2. Export Agriculture (spices)	Department of Export Agriculture	Department of Export Agriculture	Department of Export Agriculture	
3. Non-Plantation	Department of Agriculture/ Universities	• Department of Agriculture • Provincial Dept. of Agriculture • Mahawalli Development Authority • Cooperative Dept. • *Samoodi* Development Authority • Agrarian Services Dept.	• Dept. of Agri. • Provin. Dept. of Agri. • *Samoodi* Dev. Authority	Private Sector: • NGOs • Banks • Farmer Companies
4. Livestock	Dep. of Animal Production & Health	Provincial Dept. of Animal Production & Health	Dept. of Animal Production. & Health/ Provincial Dept. of Animal Pro & Health	Private Sector

12. THAILAND

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INTRODUCTION

Agricultural extension is one of the most important policies of the government of Thailand to reduce the poverty of Thai population. In the year 2000, the estimated population was about 62 millions with a growth rate of one percent. Thailand is still considered as an agricultural based country. The production area is about 265,200 km^2 of the total area of about 512,000 km^2. About 58 percent of the population is engaged in agriculture (36 million). Agriculture production accounts for 1,000,000 million baht. Approximately 600,000 million baht is consumed in the country, while 400,000 million baht is exported. The government has strongly focused on the improvement of agricultural sector, by setting up policies and showing commitment to the sector continuously. The government pushed up the agricultural sector to solve the economic crisis that commenced in 1998 as a great production in the agricultural sector was perceived to lead the industrial, trade, financial and economic sectors to grow up firmly. Moreover, the government has also set the goal to make Thailand, the "Kitchen of the word".

However, the development of agricultural sectors still needs support from other sectors. The development of basic agriculture structure must be operated, while high yield per unit area needs to be improved. The investment cost needs to be reduced while quality of the production needs to be improved to conform with the international standards. Therefore, developments of production technologies including agro-processing and marketing need to be improved. These activities certainly need the skill of agricultural extension to push the policies to be operated at the grassroots level (farmers).

VARIOUS ORGANIZATIONS INVOLVED IN AGRICULTURAL EXTENSION SYSTEM (AES)

The government certainly uses the agricultural sector to increase the income of people at the grassroots level. In 2002, ten millions of population (2.7 millions household) were under the poverty line (922 baht/head/month). The target income for this group was set to be higher up to 1,667 baht/head/month (20,000 baht/head/year) in 2006. This is a challenge for the government officers who are designed to promote agriculture productivity. There are various organizations involved in agricultural extension system:

1. Government organizations

1) Department of Agricultural Extension (DOAE)

This is the major government organization working closely with the farmers. The main department is located in Bangkok and there are provincial offices located in all the provinces. Under the provincial offices, there are agricultural extension offices providing extension staffs for each sub-district. The DOAE normally promotes farmers to produce economic crops, and also advises them to solve production problems.

DOAE Case study 1*: Rice production project*: The rice production project (Kao Khaw Tok Mali 105) had been set to achieve the target 6.3 million tons/38 provinces/year within two years. The target was touched in time in 1993, when 1.2 families participated in the project and produced 6.3 million tons of rice with a yield of 320 kg./rai (1 rai = 1600 m^2).

DOAE Case study 2*: Increase in yield of soybean project*: Soybean is a very important crop for feeding agro-processing industry. The industry needs 1 million tons/year while the production capacity of the country was 130,000 ton/year in last decade. After running the program, the DOAE promoted farmers' capacity to produce 600,000 tons/year. Consequently, the import of soybean was reduced up to 40 percent.

DOAE Case study 3*: Fruit production and processing for exporting project*: The DOAE has strongly promoted fruit and fruit processing for the export project. The amount of export was 1-2 million

ton/year and the cost was 30,675 million baht. The most valuable crop was pineapple, which accounted for 42 percent of the exported value.

2) The other Government Organizations

In the past, many government organizations worked on agricultural extension program including Department of Agriculture (DOA), Department of Animal Husbandry, and Department of Fishery. Recently, the representatives of these organizations have been working together in the district areas and the working unit named Mobile unit (MU). The responsibility of the MU team is to stimulate and support the initiation idea of farmers, advice the farmers to solve the principal problems and to contact a specialist to help farmers solve difficult problems.

2. Non-Government Organizations (NGOs)

Not only have government organizations implemented the agricultural extension program, the NGOs have also been involved. Over the last three decades, many NGOs have sprung up to complement the work of government. In Asia, such as Thailand and Philippines, a number of NGOs continue to work for the basic needs of poor villagers in urban and rural areas. In general, NGOs trend to work with and have better access to grassroots groups and villagers, lacking the opportunity in terms of standard of living. NGOs usually transfer their appropriate skills to the targets. They can also contribute the needed innovation, flexibility, and dedication, which are necessary to the rural and agricultural development activities. For doing this, the NGOs still use the villager participatory approach in their development processes. NGOs tend to have various approaches to develop rural and agricultural extension programs. The development agencies attempt to design an approach that will create an appropriate model depending on the circumstances. Actually, the models can help NGOs to decide where they can make the greatest contribution to the rural communities. Generally, four main approaches adopted by NGOs are relief and welfare, community development, sustainable development and villager movements.

NGO Case study 1: The famous Thai NGO named "The Population and Community Development Association" (PDA) has initial a mission to implement the efforts of the Royal Thai Government to promote family planning in urban and rural areas in Thailand. The PDA used a community-based strategy to recruit and train **r**espectable villagers to provide information and distribute affordable contraceptives directly in their communities. The success of the PDA's community-based approach to family planning encouraged them to apply the same strategy to other development programs such as agricultural extension and rural industrial promotion throughout the country. The most popular agricultural extension system of the PDA is the vegetable bank or sky irrigation. The program is a village- based irrigation system developed for the purpose of year–round, intensive production of high value crops, especially for vegetables and flowers. It consists of both a physical infrastructure to utilize existing water resources for irrigation as well as related organizational structures to manage the irrigation system. The basic sky irrigation module has a size of 12.5 rai (2 hectares) and 25 members who hold a plot of 0.5 rai each. In terms of infrastructure, sky irrigation has three main components:

a) A pump and control system to extract water from either surface or underground sources;
b) Holding tanks to store the water; and
c) A network of pipes with taps and small tanks reserved at each member outlet.

Regarding organizational structure, the Sky Irrigation Systems (SIS) are managed by the Village Water Management Committee (VWMC), specially set up for this purpose. The 11 persons committee is elected by the assembly of members and has the specific task of collecting water, carrying out the system maintenance work as well as assisting members on agricultural and marketing matters. Importantly, women representation must be at least 50 percent on the committee.

Membership in the project is voluntary and basically open to all village residents. Each member has to make both financial and in-kind contributions to the project. With regard to the financial contribution, they commit themselves to repay the construction cost of sky irrigation system on a monthly basis, based on a flat rate and by the amount of water used. Members also contribute their own labor to help in the system construction. These local contributions ensure that the project addresses member needs and is economically viable. The sky irrigation project has been implemented continuously since 1990. At the moment, 126 sky irrigation schemes have been built and a total of 3,280 farmers are benefiting from the schemes. Apart from having chemical free vegetables for healthy nutrition year round, villagers can earn approximately 3,000 baht/month from joining a vegetable bank, which is a sizable complementing income for the mostly poor farmers in the North east.

Two villages that participated the program are described here:

1) AES at Wang Hin Sky Irrigation Scheme

The village of 199 households has 8 rais (about 2 hectares) of common land, which has historically been utilized for livestock farming. The common had no reliable irrigation supply and was located at some distance from the village households. The village members had observed the work of PDA in supplying water to others, and joined with them in establishing a water source for this common area. A deep well was sunk, concrete storage tanks were installed, and agreement was reached by the villagers. Prior to undertaking the construction work, the PAD had taken the members of the project to visit the previous schemes. The objectives were to let them learn and gain experiences on vegetable production and marketing including group management skills. Furthermore, the training courses on vegetable production, management and marketing had been organized.

The PDA approach to this particular program was similar to its overall philosophy. The PAD insisted on its core principles of involving the entire community in all decisions, in commitment to the project and in transparent management and administration of the program and furnishing a better future for it and the community through the surpluses it generates.

2) AES at Nong Bua Dimi Sky Irrigation Scheme

There were many organizations involved in this scheme such as NGOs, business sectors, state owner and DOAE. The sky irrigation system placed with the utilization of land alongside the railway line, owned by The Rail Authority of Thailand for agricultural purposes. The rail authority is a State Owner Enterprise (SOE), and accordingly bureaucratic, and does not have a social mandate that includes provision of arable land to the community. The PDA recognized that if it could cut through the red tape, and obtain land use permission, it could deliver a reliable water supply to the land for vegetable cropping, a source of cash income.

The site was established and water provided by deep wells, stored in concrete tanks, and provided to the individual plots, metered for use at approximately 5 km and 40 m on either side of the rail line. An annual rental is paid for the rail authority, to ensure continuity of use.

As in the village sky irrigation program, the original water facility was established with a loan this venture cost 400,000 baht to set up which was to be repaid from the cash receipts of the venture. An interesting twist in the case, is that BAAC (the Bank of Agriculture and Agricultural Cooperative) provided the loan, ESSO company guaranteed repayment, and the village collectively signed up to ensure loan repayment. Water is metered at 3 baht/cubic meter, and is sold to the adjacent land users at 5 baht, providing and additional revenue source.

Twenty-five farmers from a community of 103 households joined the project on profit-sharing basis for rendering the community services. Each farmer earned at last 3,000 baht/month from joining the activities. The sky irrigation scheme is placed near the village, thus the family members worked together, leading to a warm family atmosphere. Further, this program helped the fight against drugs (amphetamines), which is a real problem in Thailand. The idle time, spent in drug dealing was then redirected to working on this project. A model of the Sky Irrigation Project is depicted in Figure 1.

METHODOLOGICAL TOOLS IN AES

Various methodological tools are being applied in AES in Thailand. The important ones are:

1) *Meetings*: give farmer the information on agricultural aspects;
2) *Field visits*: learn and gain the real experience and stimulate the group target;
3) *Trainings*: To impart Vegetable production skill, marketing management, accounting;
4) *Demonstrations*: let farmers practise in their own land;
5) *Farmer Schools*: The group leader built a hut for visitors who want to learn and the members had to pay for the program;
6) *Department store visits*: e.g. Tesco Lotus, Makro for getting the order; and
7) *Agricultural Technology Transfer Center*: Extensionists is the coordinator.

IMPORTANT ISSUES IN ENHANCING SUSTAINABLE AES

1) *Participation*: members have participated in planning, constructing, sharing benefits and management;
2) *Ownership*: The construction such as sky irrigation system belongs to farmers, not the NGOs or GOs;
3) *Revolving loan fund*: Group fund for maintenance and management is run by the group;
4) *Farmer leadership* : Active leadership with good coordination ability;

5) *Appropriate technology*: farmers can repair, maintain and operate the system themselves;
6) *Organizations involved* : GOs, NGOs, and Business sectors support;
7) *Communication channel*: Easy communication between farmers and extensionists; and
8) *Field visit of extensionists*: Should be regular and help transfer knowledge to farmers.

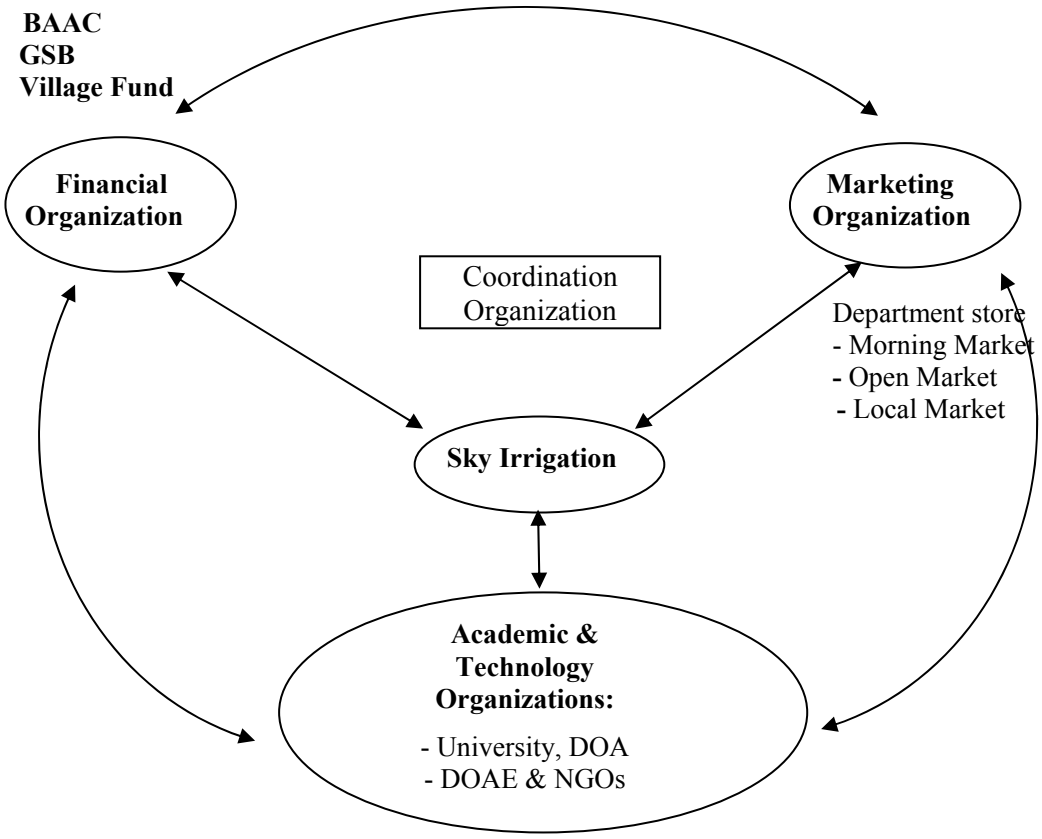

Figure 1: Strategy to Push AES (Case Study: Sky Irrigation Project)

CONCLUSIONS

Thailand has been an agricultural economy for many centuries. Till the present, approximately 60 percent of population was involved in the agricultural sector. Those people can produce up to 1 million million baht a year. Further, many organizations have implemented on agricultural extension program such as DOAE, DOA, and NGOs. Sky irrigation project, implemented by PDA (an NGO organization in Thailand) is the concrete example. In this project, various AE methodologies have been used in the processes. However, ownership and management by the farmers group is very important for sustainability. Furthermore, the business sector should participate and get involved in agricultural extension in terms of providing business skills, technologies and financial support. The success of this project has made the government pay attention to the AES.

REFERENCES

Taweekul, K. (2002). *NGO Promoting Water Resource Development Poverty Alleviation*. Stockholm International Water Institute. Sweden.

Phunpinit, S. (2001). *Agricultural Extension Education*. Ruamsarn. Bangkok. Thailand.

Taweekul, K. (1999). *Assessing Outcomes Of Private Company Involvement In Rural Development In Thailand*. Master thesis,Lincoln University. New Zealand.

Pyvis, R. (2000). *The Management Equation*. Robert Webber. Bangkok. Thailand.

DOAE (2003). *Agricultural Technology Transfer Center*. online. www site. http://www.doae.go.th/centech/techno.

DOAE 92003). Statistic for Indicators online. www site. http://www.doae.go.th/stat/newdata/m15

Annexure I

Per Capita Income/ Per Capita GRP : 1993-1995

Baht/ Head

1993	1994	1995p	Region
27,169	30,521	34,565	Northern
18,020	20,890	24,834	Northeastern
47,859	56,360	64,896	Central
80,585	92,355	109,138	Eastern
41,184	45,564	52,885	Western
35,074	40,976	47,947	Southern
173,393	191,166	212,278	Bangkok and Vicinities
54,809	61,909	70,754	Whole Kingdom

Source : Office of The National Economics and Social Development Board

Annexure II

Number of Province, District, Tumbon, Village, Population, Farms and Farm Holding Land by Region: 1997

Province	District	Sub-district	Tumbon	Village	Population	Number of Farms	Farm Holding Land
17	178	16	1,562	14,526	11,986,299	1,293,997	29,216,745
19	278	43	2,678	29,518	20,876,200	2,273,549	57,859,173
8	72	2	725	5,637	4,241,045	236,492	7,608,261
9	63	10	572	4,879	4,946,032	312,308	10,972,273
8	60	2	635	5,280	4,673,570	331,035	8,657,158
14	143	8	1,083	8,044	7,808,073	801,434	18,164,960
75	**794**	**81**	**7,255**	**67,884**	**54,531,219**	**5,248,815**	**132,478,570**

Source : - Department of Local Administration
- Number of farm and Farm holding land; Office of Agricultural Economics

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2. PROGRAM OF ACTIVITIES

(15 – 20 December 2003)

Date/Time	Topic/Activity
Mon., 15 Dec.	
Forenoon	Registration
	Inaugural session
	Brief remarks about the program by the APO Secretariat
	Presentation and discussion on topic I: *"Agricultural Extension in Asia and the Pacific: Time to Revisit and Reform"* by Dr. M. Kalim Qamar Senior Officer (Agricultural Training and Extension) Extension, Education and Communication Service Research, Extension and Training Division Sustainable Development Department FAO-UN, Rome
Afternoon	Presentation and discussion on topic II: *"Strengthening Education-Research-Extension Linkages for Effective Agricultural Extension Service - Experience of Pakistan"* by Dr. Ansar Ali Khan Freelance Consultant Pakistan
	Presentation and discussion on topic III: *"Integrated, Multidisciplinary and Holistic Rural Development Approach for Effective Agricultural Extension Services"* by Dr. Andrew P. Davidson Senior Lecturer School of Sociology and Anthropology University of New South Wales Australia
Tues., 16 Dec.	
Forenoon	Presentation and discussion on topic IV: *"Cyber Extension: Information and Communication Technology Applications for Effective Agricultural Extension Services-Challenges, Opportunities, Issues and Strategies"* by Dr. V.P. Sharma Director (Information Technology, Documentation and Publications) National Institute of Agricultural Extension Management, MANAGE, Hyderabad, India
	Presentation and discussion on topic V: *"Prospective Extension Methodologies for Improving Agricultural Productivity and Rural Livelihood"* by Dr. M. Kalim Qamar and Dr. Ansar Ali Khan
	A Video Presentation on Japanese Agricultural Extension Systems
Afternoon	Presentation and discussion on topic VI: *"Participatory Extension - An Approach for Innovative Agricultural Development"* by Mr. Muhammad Tahir Waqar Senior Program Officer National Rural Support Program Pakistan
	Presentation of country papers by participants

Wed., 17 Dec.	Presentation of country papers by participants
Thurs., 18 Dec.	Workshop
Fri., 19 Dec.	
Forenoon	Visit of UAF research labs. and experimental area
	Seminar enrichment session: - Address by Ch. Muhammad Iqbal, Minister for Food, Government of the Punjab.
Afternoon	Field Visit
Sat., 20 Dec.	Program evaluation
	Discussion on adoption of Seminar Highlights
	Closing session