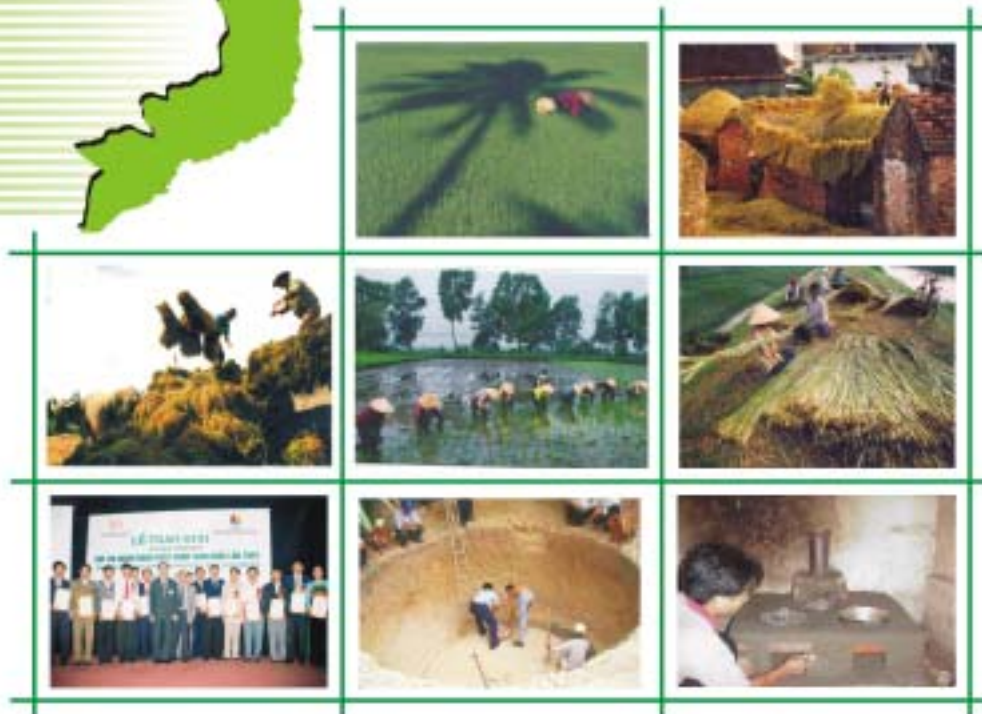


GREEN PRODUCTIVITY & INTEGRATED COMMUNITY DEVELOPMENT THE VIETNAM EXPERIENCE (1998 – 2003)



Asian Productivity Organization



GREEN PRODUCTIVITY -

INTEGRATED COMMUNITY DEVELOPMENT
FOR POVERTY ALLEVIATION
THE VIETNAM EXPERIENCE

APO
DEMONSTRATION PROJECTS
IN VIETNAM
1998-2003



ASIAN PRODUCTIVITY ORGANIZATION



VIETNAM PRODUCTIVITY CENTRE

2006

ASIAN PRODUCTIVITY ORGANIZATION

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PREFACE

The Vietnam Productivity Centre (VPC), together with the Asian Productivity Organization (APO) and the Ministry of Science and Technology (MOST) has successfully implemented Green Productivity (GP)/Integrated Community Development Projects at the community level. Between 1998 and 2003, GP Demonstration Projects were successfully implemented in 81 villages in Vietnam. These projects were made possible with the financial support of the APO and the Vietnamese Directorate for Standards and Quality (STAMEQ). The VPC also had the cooperation and support of MOST, various provincial Departments of Science and Technology (DOST), the Departments of Natural Resource and Environment (DONRE), Departments of Rural and Agricultural Development (DARD), the communities where projects were implemented, many research institutes, and countless other organizations.

The VPC would like to thank all the above-mentioned organizations and also the following organizations involved in the publication of this booklet:

- The APO for providing a grant for the publication of this booklet;
- DOST, DONRE, DARD, and various Provincial Departments of Standards and Quality for providing invaluable comments that have contributed to the success of this booklet; and
- The staff of the VPC who compiled this booklet.

This booklet provides details of the GP methodology and GP in Vietnam and gives information on the project implementation progress in Viet Nam. It clearly demonstrates how GP can be successfully applied within communities.

If you have any comments and/or suggestions on how this booklet can be improved, we would like to hear from you. Your comments and/or suggestions will help us make this booklet an invaluable resource that can be used to promote and expand GP programs in Vietnamese communities as well as internationally.

Vietnam Productivity Centre

Directorate for Standards and Quality

INTRODUCTION

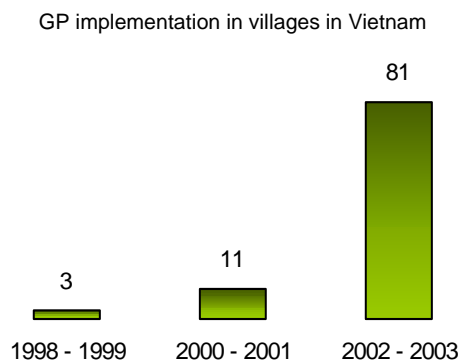
1. APO AND GREEN PRODUCTIVITY

The Green Productivity (GP) concept was established by the Asian Productivity Organization (APO) in 1994 as an outcome of the Rio Earth Summit in 1992. GP is a strategy used to address environmentally sustainable development and aims to enhance productivity and socioeconomic development while ensuring environmental protection. It applies environmental management tools, techniques, and technologies to reduce the impact of an organization's or communities' activities, goods, and services on the environment.



GP is applicable to the manufacturing, agricultural, and service sectors. Nineteen countries throughout Asia and the Pacific are members of the APO, and GP methodology has been, and continues to be, applied to many different-sized enterprises within these countries. The benefits gained from GP implementation are significant in terms of productivity enhancement and environmental protection. Vietnam is the first country to implement GP at the community level.

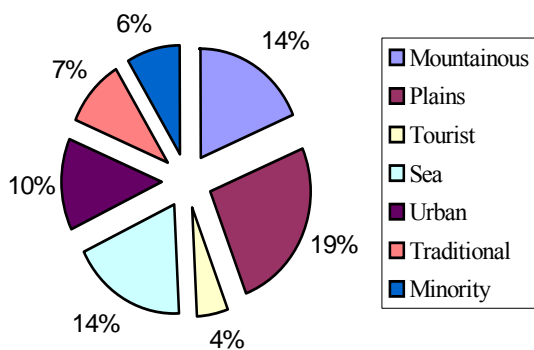
2. GP PROGRAMS IN VIETNAM



The GP in Communities Program began in Vietnam in 1998 as a pilot program in three villages. In Phase II, 1999–2000, the GP Program was expanded to nine villages. In these phases, the primary areas of concern included clean water supply, solid waste management, and reduction in the use of pesticides and chemical fertilizers, and traditional career development.

The Vietnam Productivity Centre (VPC), under the Directorate for Standards and Quality (STAMEQ), has been successfully implementing GP projects in community groups in Vietnam since 1998. Given that the majority of GP projects in other APO member countries have been implemented in the industrial sector and on agricultural farms, Vietnam was the first country to implement the GP concept in community groups. The GP Program in Vietnam is, therefore, different from those in other APO member countries as far as the nature and scope are concerned.

In response to the success of Phases I and II (1998-2000), the GP Program was expanded so that in 2001-2003, GP was introduced into 81 villages in 21 provinces. Villages from the north, the south and the center of Vietnam currently participate in the GP Program. The characteristics of villages under the GP Program vary as displayed as follow:



Characteristics of villages under GP Program in Vietnam

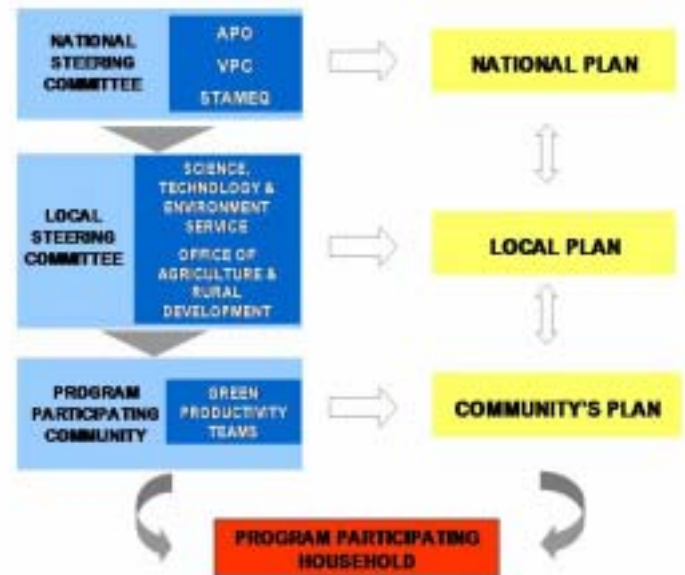
In addition to the GP issues considered in Phase I and Phase II, additional GP options have been generated and implemented. These include planting trees to prevent sand erosion, worm farming, beekeeping and the use of a foliage color table to control nitrogenous fertilizer use in rice farming. Additional GP options for environmental protection and income generation were developed and implemented widely in this phase.

“Vietnam has set a pioneer example for other Asian countries to follow in the application of Green Productivity (GP) at community level” – Takashi Tajima, Secretary -General – Asian Productivity Organization

Province	Village	Mountainous	Plain	Tourist	Sea	Urban	Traditional	Minority
Ha Noi	Huong Long					■		
Hai Duong	Man De						■	
Quang Ninh	My Cu				■			
Thai Nguyen	Thanh Lap		■					
Bar Giang	Kha Ly Ha	■						
	Tinh Loc	■						
	Ap	■						
	Binh An		■					
	Cho Mai		■					
	Dong Huong		■					
	Lai	■						
	Thuan		■					
	Thung Dong		■					
	Kim Sim					■		
Hinh Binh	Thang Thanh			■			■	
	Van Thi						■	
	Vuon Thi	■	■					
	Tri Chinh					■	■	
	Kien Thai						■	
Hoa Binh	Lac							■
	Dam							■
	Trai							■
Ha Tinh	Xuan Thanh				■			
	Thach Chau				■			
	Hu Lai				■			
Nghé An	Quyên Lương				■			
	Nghi Thu				■			
	Hung Nhan		■					
Hue	Phu Hau		■					
	Phu Hai				■			
	Thuy Chau		■					
Da Nang	Nam Ô 2				■	■		
	Thanh Vinh					■		
	Hoa Phu	■						
Quang Nam	Phuoc Kieu						■	
Quả Lãi	Phuoc Thum							■
Kon Tum	Konkrachot							■
Phu Yen	Hoa An		■					
Ho Chi Minh	Xuan Thai					■		
	Binh Chanh					■		
	Thai My					■		
Can Tho	Dinh Phuoc		■					
	Nhon Loc		■					
Vinh Long	Phuoc Hau		■					
	Phu Thanh		■					
Vung Tau	Lam Lon	■						
	Phuoc Hai				■			
Ban Tra	An Phong	■						
	An Binh	■						
	An Loc	■						
Ca Mau	Ba Dieu				■			
	Cai Ra				■			

3. METHODOLOGY

The process of implementing the GP program in Vietnam adopted the following organizational framework:



- Establish of the National Steering Committee;
- Develop of a national action plan;
- Set up provincial steering committees, who coordinate all project activities in the province through a coordinator;
- Combine national action plan with provincial plans;
- Select participating villages;
- Establish a GP team in each village, which includes representatives from local leaders, relevant sectors and social organizations; and
- Select the households to pilot the program.

❖ Selection of villages

In order to participate in the GP Program, villages are required to meet the following criteria:

- Commitment of local authorities to GP implementation;
- Commitment of village/commune to GP implementation; and
- Both the village and province need allocate amount of budget for GP option implementation.

The VPC reviews the information from the provincial level, and based on this will organize an initial survey of the registered villages. The selection of participating villages is based on the requirements and commitment of both the village and the provinces.

❖ **Setting priorities**

Selected villages will be classified based on priority, as described below:

- First priority: Provinces that participate in the GP Program for the first time;
- Second priority: Provinces that participate in Phase 1 and Phase 2; and
- Third priority: Villages that participated in a previous phase and is currently expanding and maintaining the program.

The onsite visits for VPC staff to the province is based on the village's priority ranking.

First priority: The average number of onsite visits is eight.

1 st visit:	Agreement between VPC and provincial DOSTEs
2 nd visit:	Training on GP concepts and methodology, GP option generation and selection, and development of an implementation plan for GP options
3 rd visit:	GP options training (integrate with monitoring)
4 th , 5 th visit:	Monitoring
6 th visit:	Exchange with other GP teams
7 th visit:	Prepare for GP contest
8 th visit:	GP contest at village

Second priority: The average number of site visits is seven.

1 st visit:	Agreement between VPC and provincial DOSTEs
2 nd visit:	GP option generation and selection and development of an implementation plan for GP options
3 rd visit:	GP options training (integrate with monitoring)
4 th , 5 th visit:	Monitoring
6 th visit:	Prepare for GP contest
7 th visit:	GP contest at village

Third priority: The average number of onsite visits is five.

1 st visit:	GP options training
2 nd , 3 rd visit:	Monitoring
4 th visit:	Exchange experience with other GP teams
5 th visit:	GP contest at village

❖ Partnership

3.3.1 Steering Committee

The GP process involves various organizations at different levels such as:

- The Central Steering Committee;
- Provincial Steering Committees; and
- GP Teams.

The Central Steering Committee includes representatives from the APO, STAMEQ, VPC, and

external technical experts. This committee has responsibility for the overall coordination of the project, providing technical expert support, and monitoring the progress of the project.



GP competition

A Provincial Steering Committee is also formed in each province to implement the GP Program. These committees include representatives from the provincial DOSTE, the village head and local experts who support villagers in implementing GP projects. The Provincial Steering Committees are important for ensuring commitment and support from provincial and community managers. The main responsibility of the

provincial steering committee is to monitor project activities in their province and to adjust the implementation plan as the situation changes.

GP teams are formed in each village. The team members are representatives from local unions or associations, such as the local Women's Union, Youth Union, and Farmers' Association. The GP team system encourages and empowers all team members, as they become directly involved in promoting project activities and helping fellow villagers to understand the benefits of the program. Through the GP teams, GP options have expanded widely in the surrounding communities.

A typical GP team includes eight to 10 members. However, the number of team members may change according to the scale of each village. Each team member has responsibility for a particular issue, such as the provision of clean water supplies, solid waste management systems, or chemical and pesticide control. The teams develop self-governing regulations as a framework for the GP team's activities. GP teams meet frequently to identify the problems that are faced by the village to propose and implement solutions to solve those problems.

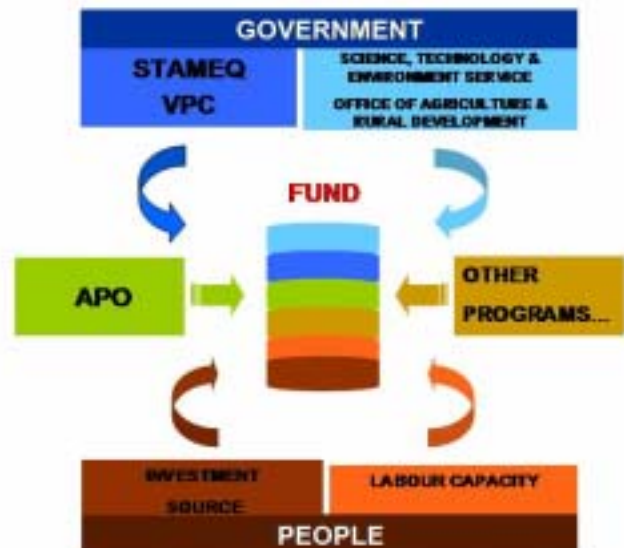
3.3.2 Project coordinator

In order to evaluate and monitor the project's progress, a network of coordinators is established from national to village level. At the national level, a group of coordinators is established. Each coordinator is responsible for monitoring GP programs in several provinces. Each province is assigned one coordinator to monitor the progress of projects at the provincial level and to report to the VPC. The coordinators at the village act as a bridge between village and provincial organizations.

3.3.3 Coordination with other local programs in the province

The program's budget is a joint effort between the state and the people:

- The APO, VPC, and STAMEQ provide experts and help the program apply appropriate technologies.
- The budget to realize these solutions is from the Science Research Fund of the MOST.
- Local people give labor and financial contributions to develop models for their own locality.



Most GP options are implemented in conjunction with other local programs in the provinces, such as the Mountain Rural Development Program, the Rural Clean Water Supply Program, or the Poverty Alleviation Program. As many other community development programs also have similar objectives to the GP Program, the integration of these programs with GP can strengthen the overall contribution to socioeconomic development in rural areas.

As many other community development programs also have similar objectives to the GP Program, the integration of these programs with GP can strengthen the overall contribution to socioeconomic development in rural areas.

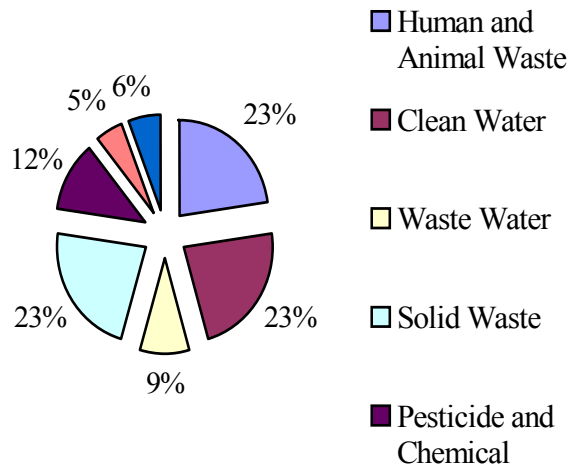
3.3.4 Network of experts

GP teams and other coordinators of project activities in the province are trained in GP methodologies. The network of local technical experts is established with reference to the identified problems and proposed GP options for each area. The DOSTE coordinates and implements GP options with the collaboration of technical experts from various fields such as energy, agriculture, clean water supply, and forestry extension. These experts train and transfer relevant technical information and expertise to GP team members and villagers.



GP experts meeting

4. MAIN ISSUES



Main issues in GP implementation villages

The villages cover a range of different socio-economic conditions and have differing environmental conditions and problems. Some of the problems that are commonly faced include:

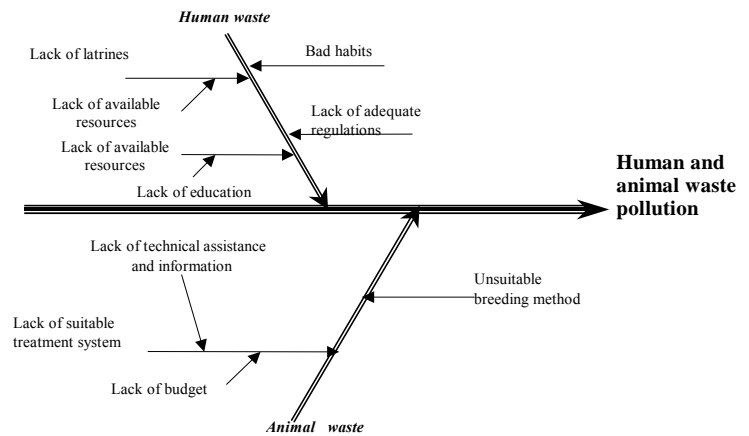
- Human and animal pollution;
- Clean potable water supply;
- Pollution due to storm water runoff;
- Solid waste disposal;

- Inappropriate use of chemical fertilizers and pesticides;
- Low income; and
- Limited environmental awareness of villagers, especially regarding the application of new technologies for environmental protection.

❖ Human and animal pollution

The primary causes of human and animal waste pollution are:

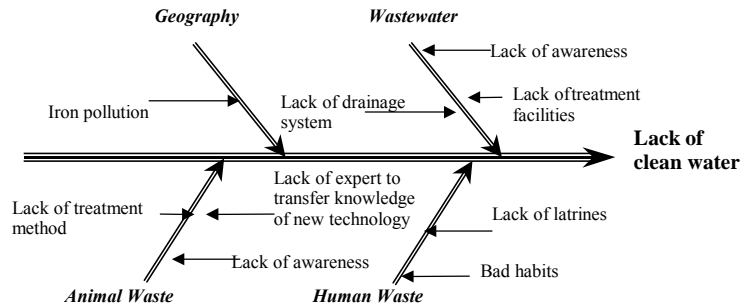
- Facilities: old breeding facilities, limited knowledge and budget for the construction of appropriate breeding facilities;
- Technology: lack of understanding of the options available for rearing animals;
- People: limited awareness of environmental protection;
- Management: local regulations are not adequate or enforced, cooperation between each government level is weak, and regular meetings to consider environmental protection issues are not convened;
- Lack of funds for the construction of suitable latrines; and
- Lack of treatment systems.



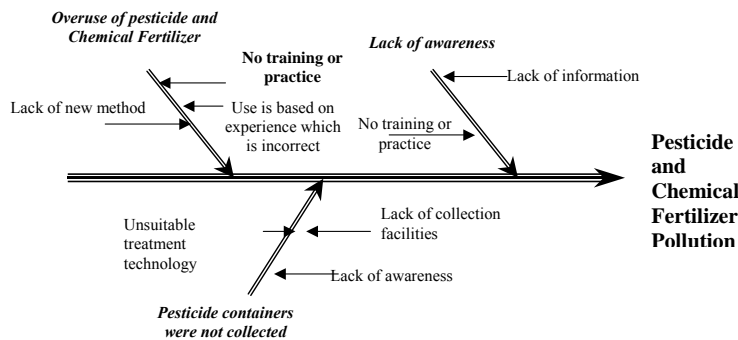
❖ **Clean water and wastewater**

The main causes for lack of clean water in rural areas are:

- Geographic conditions (iron and manganese pollution);
- Human and animal waste pollution;
- Lack of budget and facilities for appropriate clean water treatment; and
- Pollution due to storm water runoff.



❖ **Inappropriate use of chemical fertilizers and pesticides**

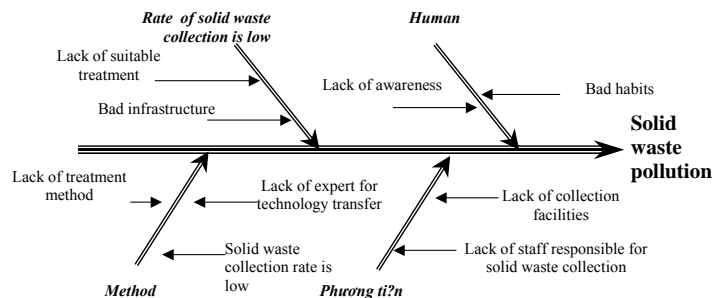


- Lack of awareness of suitable handling and use;
- Inappropriate chemical container storage and disposal; and
- Overuse of chemicals.

❖ **Solid waste disposal**

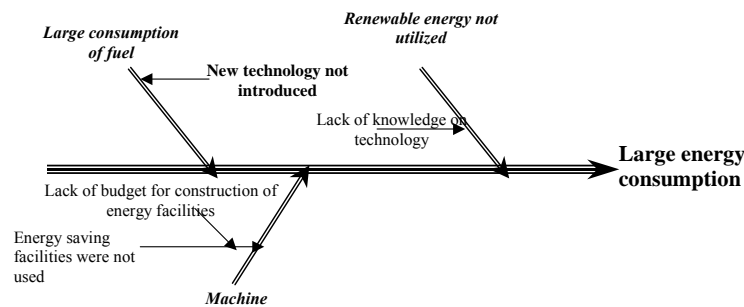
The main causes of unsuitable solid waste management can be summarized as:

- Lack of knowledge of solid waste treatment;
- Lack of solid waste collection and classification facilities;
- Lack of infrastructure for solid waste collection and treatment;
- Lack of solid waste collection teams; and
- Lack of regulations for solid waste management.



❖ **Inefficient use of cooking fuel**

The main cause of inefficient use of cooking fuel, which lead to a large consumption of energy can be summarized as:



- Lack of knowledge of available technology for saving energy;
- Renewable energy is not utilized; and
- Lack of budget for the application of new technology.

❖ **Income generation**

The main causes of low income in rural areas are summarized as follows:

- No alternate occupation/by-trade;
- Unstable market prices for agricultural products;
- Not enough capital for investment;
- Lack of information on available technologies; and
- Poor economic returns for crops.

5. GP OPTIONS, IMPLEMENTATION AND RESULTS

Through its five-year implementation period (1998-2003), the GP Program resulted in significant benefits to people in rural areas in terms of living standard enhancement and environmental protection. In addition to the tangible achievements of biogas, energy-saving stoves, hygienic latrines, etc., there were also intangible achievements, such as enhanced awareness of environmental protection that is also important.

❖ **Training**

Training and promotion are effective methods to increase local people’s awareness of environmental protection. Through the training courses, people have opportunity to learn technical information that can help them to improve their quality of life and the local environment. The training courses vary greatly, depending on the local problems faced and the solutions proposed by the GP team. Training in the GP concepts and methodology has been held in 21 provinces within Vietnam, with the participation of 1,857 people. Training courses on new rice varieties attracted more than 1,000 people in Hai Duong; Environmental



Integrated Pest Management training course

Awareness attracted 200 people in Phu Hai-Hue; and Integrated Pest Management in Ha Tinh, Ho Chi Minh, and Nghe An, Phu Yen had involved more than 700 participants. Through these training courses, people had an opportunity to learn about new GP options, which may help them improve their living standards as well as the environmental conditions in their area.

“We just provide the Green Productivity methodology for villagers and they will apply this methodology to solve their own problems. The key factor for the success of the project is the awareness of the people. While they recognize the benefits of the GP options, they will implement and disseminate these options” – Mr. Dang Thanh Long, Office for Environment and Community Development, Vietnam Productivity Centre

❖ Promotion

GP promotion and dissemination activities are a very important factor in the success of the GP Program. Depending on the project goals and contents, a number of channels are used to promote GP including:

- Banners, slogans, and posters;
- Establishing a promotion campaign on mass media, i.e., TV and radio;
- Organizing study missions on GP practices;
- Facilitating GP demonstration village visits;
- Conducting GP competitions;
- Reporting on GP Programs through TV, local, and national media; and
- Organizing training courses, seminars, or conferences on GP practices.



GP banner



GP competition

The main method of promoting the GP methodology and news in villages is through the use of banners, slogans, posters, local radio, TV, and notice boards. The aims are to disseminate the benefits of GP solutions as well as appeal to people to join the Program. This has been most successfully used in Hai Duong, Phu Yen, Da Nang, and Ho Chi Minh City.

Another GP promotional activity is to visit demonstration villages that have successfully implemented the program to

learn and share practical GP experiences. These visits can be both locally organized by provincial authorities, or occur to share information among provinces and can be organized at a national level. This method of promotion provides villagers with opportunities to learn and share experience in GP implementation. The achievements gained from implementation of a GP demonstration projects are practical and visual, facilitating program enhancement on a broad scale.

The GP competitions are an additional way to motivate local people to participate in the program. At the competition, contestants are questioned on GP, GP solutions, project implementation, and benefits. These competitions are an effective way to promote GP activities and are usually organized in conjunction with entertainment activities in the villages.



Picture exhibition at GP convention

methodology were held in Ninh Binh and Ho Chi Minh City which provided an opportunity for villagers of all regions to exchange GP practices. Moreover, in cooperation with local and national TV, the VPC made programs about GP methodology and practices to disseminate its benefits to all Vietnamese.

A national Green Productivity Conference was held in Hanoi in March 2003. Approximately 250 delegates from 81 villages in 21 provinces and cities attended. It offered an opportunity for the delegates, many of whom were visiting Hanoi for the first time to share experiences with each other. GP teams reported their achievements as well as difficulties. Front-rank teams were recognized with award from STAMEQ. Participants listened to comments from many local and foreign experts. Each team showed photos of their locality, their activities, and even the products produced during the project implementation process.

Recognizing the benefits of the GP Program serves as a driving force for the villagers to initiate programs in their area. For example, the competition in Hai Duong attracted more than 1,000 participants.

Publicizing the GP Program on TV and in local or national press, as well as organizing GP conferences and seminars to share the experiences and expertise of villagers are also very useful tools for GP promotion. In order to help with the nation-wide expansion of GP, two conferences on GP



Awards Ceremony for national GP convention

❖ GP options implemented

Many GP options have been implemented during the various phases of the GP Program—an overview of all options is provided in Table 2. For more details, the following sections describe the most significant achievements for each of the key issues.

Table 2: Summary of GP Options Implemented in Viet Nam to Date

Problem	GP option
Animal waste pollution	Construction of clean pig breeding facilities
	Construction of central cow breeding facilities
	Construction of biogas plants
	Construction of plastic bag Biogas models
	Construction of pig breeding facilities suitable for combination with a biogas model
	Composting models
Human waste pollution	Construction of hygienic latrines
	Construction of a public latrine
Lack of clean potable water	Improve well system
	Installation of simple filtration water treatment systems
	Construction of a central water supply plant
	Construction of tank for rain water collection
	Water treatment by flocculation and micro filtration (to remove micro organisms)
	Water treatment system by flocculation/disinfection or sand/gravel/activated carbon filtration systems.
Wastewater pollution	Install water treatment facilities in each household
	Construction of border and drainage system around common wells
	Construction of a drainage systems
	Improve drainage systems
Improper use of pesticide and chemical fertilizer	Training courses on how to use pesticide properly
	Plantation of high yield rice variety which also has high pest resistance
	Application of integrated pest management (IPM) on rice and vegetables
	Application of bio-product instead of chemical fertilizer

Problem	GP option
	Proper use of pesticides for fruit Application of “safe vegetable” limit on chemical fertilizers through the application of bio-fertilizer and bio-pesticide Application of natural farming Application of “safe vegetable” limit Application of plant color table to control the use of chemical fertilizers
Environmental pollution from solid waste disposal	Establishment of environmental protection regulations Set up a solid waste classification system Establish solid waste collection system Construction of common rubbish bins Launch of a cleaning campaign Construction of bins for pesticide container collection Improvement of rural roads for solid waste transportation Construction of landfills
Inefficient use of cooking fuel	Construction of energy efficient stove
Low income generation	Construction of advanced furnaces for processing of agricultural products Mushroom cultivation Worm farming Beekeeping at household level Pigeon breeding Frog breeding Development of traditional careers in village Improvement of the garden and plant trees with high economic returns Change of Cow breed Rice-fish, rice-shrimp model Pig rearing Planting of orange trees with high pest resistance

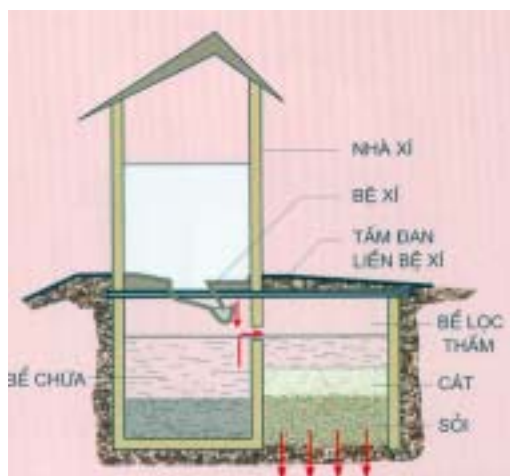
Problem	GP option
	Plantation of high-yield corn
Decrease of forest coverage area	Tree plantation
	Planting trees to prevent sand erosion
Inadequate rural infrastructure	Construction of concrete road

5.3.1 Human and animal waste

- 200 hygienic pig breeding facilities were constructed
- 524 hygienic latrines were built
- 138 biogas plants were constructed
- 22 composting models
- 10 central breeding facilities were constructed to separate cows from household residential areas



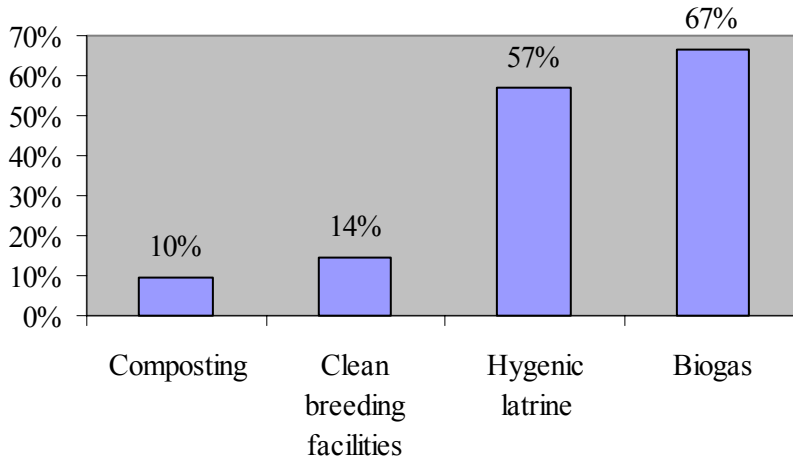
Hygienic latrine



Hygienic latrine model

GP options for human and animal waste have brought practical benefits for people in terms of improvements in the environmental conditions and productivity. For example, the construction of pig breeding facilities has significantly contributed to a cleaner environment, reduced the incidence of disease in animals, enhanced productivity and reduced pollution. Through the application of biogas technologies, villagers can treat pollution from human and animal waste and produce fuel for cooking, protect human health, and with regards to economic aspects, biogas technology can save 700,000-1,000,000 dong/household for fuel, with a payback period of 3-4 years. This GP option also has

other economic and social benefits including increased income generation, job creation, and a reduction in diseases associated with human and animal waste, etc.



GP options for human and animal waste

“We usually did not have the facilities for cattle breeding. Through the GP Program, we have constructed cattle breeding facilities which can provide better breeding conditions for the cow and also can utilize the animal waste” – Mr. Le Van Nghia, Phu Tuc village, Hoa Phu commune

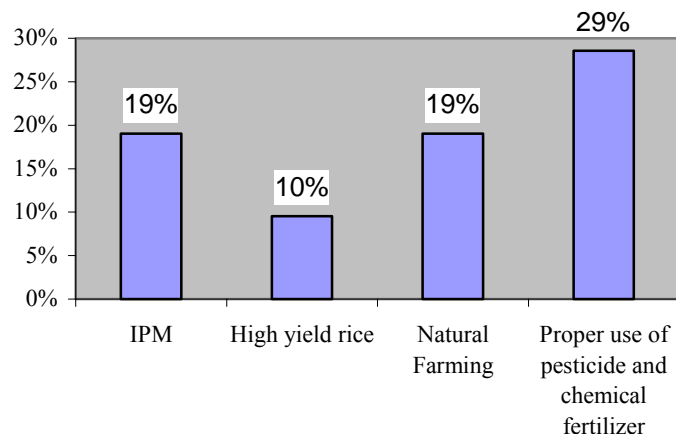
5.3.2 Water Pollution

- 33% of the 21 provinces involved in the GP program have constructed water treatment plants to supply water for the whole community.
- 28% of the 21 GP provinces have wastewater treatment facilities or drainage systems.

Implementing of the above GP options has increased the number of rural people with access with clean water. Numerous GP options are simple and easy to implement with low costs such as the rainwater collection tanks. This GP option has provided various benefits, including: minimizing diseases associated with wastewater pollution, resulting in reduced expenses for hospital treatment, providing economic benefits to the entire community. With regards to social aspects, the simple act of providing of a rainwater tank can help to increase people’s awareness of their role in environmental protection, create a beautiful landscape for the village, reduce skin and gastric disease prevalence, reduce wastewater pollution and mosquito populations, and increase the number of people with access to clean water.

5.3.4 Pesticides and chemical fertilizers

- 127 households applied Integrated Pest Management (IPM);
- six “safe vegetable” models were applied in four provinces;
- four provinces have applied natural farming; and
- 100 color tables were supplied to farmers, to limit the use of nitrogenous fertilizers.



GP options for proper use of pesticide and chemical fertilizer

The use of a color table was applied to control the application of nitrogenous fertilizers. Inappropriate use of nitrogenous fertilizer can increase the loss of rice, which can cause a 30-40% yield reduction. Through the use of a color table, farmers can halve the amount of nitrogenous fertilizer applied, providing significant cost savings.

5.3.5 Solid waste management

- 34% of provinces have established a solid waste collection teams;
- 523 solid waste collection bins were constructed;
- Three common landfills were constructed; and
- 29% of provinces have established environmental protection regulations.



Solid waste collection

The application of solid waste management in communities has contributed to improving environmental conditions in regional areas.

Additionally, it has also helped to reduce adverse effects on human health resulting from pollution of the environment. The awareness of people on environmental issues has been also enhanced through their daily activities.

5.3.6 Energy conservation



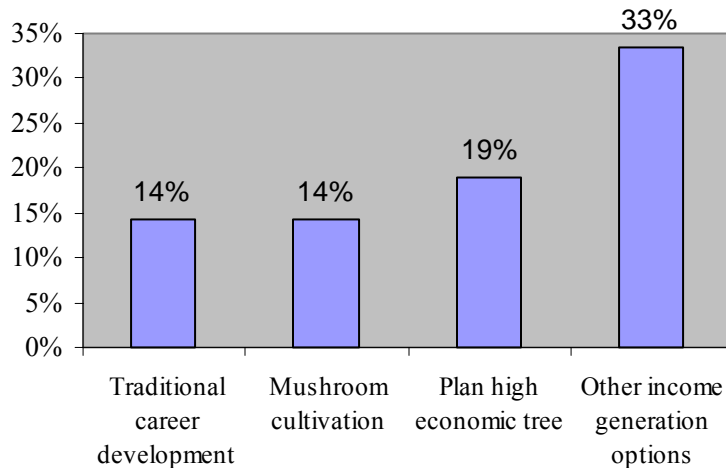
Advanced furnace

- 449 energy efficient stoves have been constructed;
- 200 advanced furnaces were applied for agricultural food processing; and
- 43% of GP provinces have applied energy conservation options.

The advanced furnace contains a separate dry chamber to ensure improved hygiene and high product quality. Workers' health is also protected since smoke is released through a high chimney. In economic terms, the return for high-quality products is significantly greater compared to the application of a traditional furnace. The application of an advanced furnace also saves 5% of fuel.

5.3.7 Income generation

- 14% of GP provinces grow mushrooms;
 - 50% of traditional villages expanded traditional careers; and
- 33% of total GP villages applied GP options for income generation



GP options for income generation have contributed to an improvement of the living standard of villagers. Other GP options such as worm farming and beekeeping attracted the attention of villagers. These create supplementary work for villagers, which help them to further increase their living standard.

Methods of Income Generation

6. ADVANTAGES AND DIFFICULTIES

❖ Advantages

- Development of rural communities is one of the priorities of the Government's development strategy. The objectives of the GP Program fit well within these priorities.
- The GP Program has strong support of governmental authorities at different levels such as MOST, the Ministry of Natural Resource and Environment (MONRE), the DOSTE, the Departments of Agriculture and Rural Development and various Research Institutes.
- A network of experienced experts has been established in the provinces as a result of the GP program.
- The GP project has mobilized the participation of people from top to bottom level. A Steering Committee established at the provincial level has monitored the progress of the project, while the GP team has participated in the entire project cycle of planning, implementation and monitoring.



Clean environment campaign

- The GP teams are participated in by a number of unions at the village level (Farmers' union, Women's union, Youth union), which play an important role in the success of the projects.
- The GP methodology is simple and easy to apply in rural areas. Most GP options have brought many benefits to villagers. Therefore, the GP program has expanded to more household and villages.
- The program has mobilized contributions from the government, local authorities and villagers.

❖ **Difficulties**

Difficulties that have been met in implementing the GP Projects include:

- Changing the mindset of the villagers to encourage the alignment of productivity and environmental protection.
- Environmental protection is often not a high priority in local communities or even within the local authorities.
- Some GP options depend on time. For example, mushroom cultivation should be conducted at harvesting time, and beekeeping should be conducted in the flower season (March) to have maximum yield. Biogas plants run into difficulties in the rainy season when the ground water level is high.
- A common problem encountered is how to maintain GP activities after the completion of the project, once external funding ceases.
- People often look to the government for investment to solve their own problems and do not recognize that environmental pollution is caused by their actions.



Mushroom growing

“While there are many approach to the development of rural communities, based on the Vietnamese experiences the APO’s integrated Community Development (GP-ICD) approach for sustainable development has proven a practical way and workable approach” – Takashi Tajima, Secretary- General, Asian Productivity Organization

GP CASE STUDIES



❖ Trai village, Hoa Binh district, Hoa Binh province

GENERAL INFORMATION

Trai village implemented Green Productivity (GP) in 2002 under the GP Integrated Community Development Program. Trai in Hoa Binh District, Hoa Binh province, is located on a low hill next to National Highway 6. Some characteristics of the village are as follows:



Trai village, Hoa Binh district, Hoa Binh province

Total amount of land: 22 ha
Cultivated land: 18 ha, comprising <ul style="list-style-type: none"> ◦ Vegetable plantation : 4.8 ha, and ◦ Lowlands used for rice cultivation: 13.2 ha. Tenure lands: 4 ha
Population: 484 people in 118 households
Average income: VND 4,100,000 /person/year
Main production activities
Agriculture: 98% of total income Other: 2%

MAIN ISSUES

- 20% of villagers used well water. However, the quality of well water was not good, which caused many health problems.
- The application of chemical pesticides and fertilizers was inappropriate. Bottles that contained chemicals were not collected and treated.
- 70% of households did not have hygienic latrines.
- Solid waste and wastewater were not properly treated and were typically discharged to gardens, rivers, or ponds.

GP OPTIONS

- (1) Increase the awareness of the villagers of environmental protection and sustainable development;



Water filtration model

- (2) Organize training courses on different GP technologies;
- (3) Establish a solid waste collection system;
- (4) Construct biogas plants and energy efficient stoves;
- (5) Utilize agricultural residues for mushroom cultivation;
- (6) Apply simple water treatment methods to ensure clean water supplies.

IMPLEMENTATION AND RESULTS

○ GP Training Activities:

- Two training courses on solid waste collection and management were conducted; and
- A training course on mushroom cultivation techniques was organized.

○ GP Option Activities:

- A solid waste collection system was established.
- Environmental protection regulations were established in the village.
- Two mushroom cultivation models were applied, with initial results indicating a high income for villagers.
- Three counter current water filtration tanks were constructed. Many villagers have



Construction of biogas plant

observed the advantages of these water treatment systems and continue to install this model in their own homes.

- Three biogas plants were constructed. These plants are capable of treating both human and animal sewage and creating clean fuel for cooking.
- 75 energy-efficient stoves were constructed. These stoves reduce fuel consumption, smoke, output, and the time needed for cooking.



❖ **Kha Ly Ha village, Quang Minh commune, Bac Giang province**

GENERAL INFORMATION

Kha Ly Ha is a village that was selected for the initial Green Productivity Demonstration Program (GPDP) during 1998 and 1999. The GP program was extended in this village during 2000 and 2002 under the GP Development Assistance program.

Kha Ly Ha is an agricultural village in Bac Giang province. The village is located in a mountainous area, approximately 60 km north of Hanoi. Some characteristics of the village are as follows:



Kha Ly Ha village, Quang Minh commune, Viet Yen district

Total amount of land: 72 ha
Cultivated land: 61 ha, comprising: <ul style="list-style-type: none"> ◦ Vegetable plantation: 30 ha, and ◦ Lowlands used for rice cultivation: 31 ha Residential land: 11 ha
Population: 1,509 people in 364 households
Average income: VND3,750,000/person/year
Main production activities
Agriculture: 80% of total income Other: 20% from various services

MAIN ISSUES

- Access to potable water is a major problem in many villages in Vietnam, including Kha Ly Ha. Wells, ponds, and lakes were the primary source of water, however, these sources were often polluted and their use by villagers results in many health problems.
- Daily activities such as cooking and burning solid waste were causing significant amounts of air pollution.
- Practices for disposing of human and animal waste were inappropriate. Disposal problems were causing both air and water pollution.
- The application of chemical pesticides and chemical fertilizers was inappropriate and causing an increase in environmental pollution.
- Disposal methods for domestic waste were increasing the problem of air and water pollution. Waste was not collected and treated. It was either burned or thrown into gardens.
- Agricultural productivity was low, mostly due to inappropriate cultivation methods used by villagers.

GP OPTIONS

- (1) Set up village-specific environmental regulations and educate the villagers on environmental management, including wastewater treatment, potable water, and environmental regulations;
- (2) Construct a centralized water supply plant, publicize the plant among villagers, and encourage the development of additional simple water systems such as water filtration pools and well water;
- (3) Apply integrated pest management (IPM) techniques and use effective microorganisms (EM) during agricultural production within the village to limit the use of chemical fertilizers and pesticides;
- (4) Establish a waste collection system at each gate to collect rubbish from houses and public areas;
- (5) Apply biogas technology for treating sewage;
- (6) Install a drainage system to minimize the amount of flooding during the wet season;
- (7) Distribute semicircular rat traps to villagers to aid in reducing damage to vegetable crops caused by rats;
- (8) Construct energy-efficient stove to reduce the amount of energy used, minimize air pollution, and improve the health of villagers; and
- (9) Introduce mushroom cultivation techniques that make use of agricultural waste, such as straw, and produce a secondary income.

IMPLEMENTATION AND RESULTS

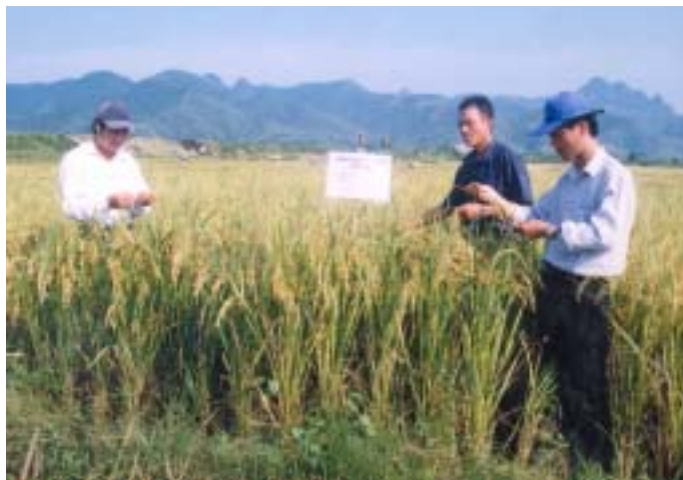
- GP Training Activities:
 - A training course on GP implementation and other technologies was organized and attended by over 2,457 people.

o GP Option Activities:

- Constructed a centralized water supply plant with 30 m³/h capacity, and 97% of households in the village use groundwater from wells.
- 30 tons of straw was used for growing mushrooms. Normally this straw would have been burned. Mushroom growing utilized a waste product of the village and generated a secondary income. Mushroom growing increased the income of villagers; for 1 ton of mushrooms they can receive approximately USD90.
- 10 biogas chambers were constructed within the village. The total volume of the chambers is 100 m³.
- 20 dustbins were distributed throughout the village, a landfill was constructed, and a waste collection team was established.
- Energy-efficient stoves were introduced into 120 households. Due to a reduction in energy consumption, each household containing four to six people saves approximately USD12/year.



Mushroom cultivation



Application of IPM in rice field

- Teams responsible for killing rats were formed in the village. By applying 700 semi-circular rat traps, teams in Kha Ly Ha village caught more than 10,000 rats. These rats were then used as pig food.
- 95% of households applied IPM technology to reduce the use of pesticides and chemical fertilizers and encourage the use of biological options.

- A pilot natural farming program was applied for rice, peanuts, soybeans, and potatoes.
- EMs were supplied to the village and used for rice cultivation and for treating solid waste. EMs are a catalyst for the disintegration of solid waste and reduce the odor from the landfill.
- Hybrid varieties of rice were cultivated with high pest resistance, which can reduce pesticide application.
- GP Promotional Activities:
 - Village-specific regulations were established to protect the environment. All households within the village made a commitment to follow these regulations.
 - The villagers became aware of the need to protect their environment. GP methodology has become the environmental preservation technique for the village. It is now applied to any new production activity.

MAIN ISSUES

- Inappropriate management of solid waste, human waste, and animal waste, which lead to air pollution, water pollution, and affected the landscape of the village and villagers' health (5.2% of the villagers had diarrhea and dysentery);
- No environmental protection regulations;
- The onion and garlic processing activities lead to air emissions that effected the health of the villagers (30% of the villagers had respiratory diseases);
- Due to a lack of water for domestic and drinking water needs, 100% of villagers used rain water for drinking and used polluted water for other domestic purposes, 100% of wells were contaminated with aluminum, 90% of ponds and lakes were polluted due to the lack of water drainage, these water pollution problems lead to health issues, and as a result 41.8% of villagers had trachoma;
- Lack of awareness of advanced technology application and environmental protection so that chemical fertilizers and pesticides were used two to five times over the permitted threshold, which led to environmental pollution and reduced the effectiveness of the chemicals; and
- Inadequate standard of rural traffic routes (nearly 10 km of pathways) which negatively impacted rural hygiene.

GP OPTIONS

- (1) Conduct a propagation and promotion campaign to enhance the awareness of GP of villagers in the community;
- (2) Set up village-specific environmental regulations and educate the villagers on environmental management;
- (3) Establish a solid waste collection and management system;
- (4) Conduct training and apply IPM to reduce the reliance on chemical fertilizers and pesticides;
- (5) Apply advanced technologies to cultivation and livestock breeding activities to increase the economic effectiveness and protect the environment;
- (6) Use advanced furnaces to dry agricultural products to protect the environment;
- (7) Construct biogas plants to treat human and animal waste, and to produce fuel for cooking and other domestic purposes within households;
- (8) Cooperate with the sanitary and fresh water program to improve drinking water sources for the villagers; and
- (9) Construct a rural concrete road system to make traveling easy.

IMPLEMENTATION AND RESULTS

- GP Training Activities:
 - Training courses on GP methodologies were organized and attended by over 50 participants, primarily made up of GP team members, environmental officers, and the manager of the commune.

- A training course on new cultivation methods to support environmental protection was conducted with 1,000 participants attending.
- A two-day training course on IPM was conducted for 40 people from the GP team and other technicians of the village.

○ GP Option Activities:

- The villagers established regulations for environmental protection, which has been approved by the commune authorities.
- A solid waste collection team with six members was established. Solid waste is now collected twice per week and treated.
- Many bins for pesticide container collection were constructed.
- A village environmental protection fund was established, with contributions from households and support by other sources.
- 3000 m of drainage system and 7000 m of concrete roadway were constructed at the village.
- 180 pig breeding facilities and 65 two-compartment latrines were built.
- 200 advanced stoves for processing agricultural products were constructed, which not only helped to increase the quality and productivity of the product, but also reduced environmental pollution and improved the health of villagers. In addition, this activity created jobs for more than 1,500 villagers from neighboring villages. Consequently, income has increased from VND300, 000 to VND400, 000/person/month.



Dustbin in the field



Banner for environmental protection

- A 10 m³ biogas plant was constructed to treat animal waste and provide energy for a household of seven members.

GP Promotional Activities:

- A cleaning campaign was launched at Man De village, with the participation of 1,000 people to clean up the whole village.
- GP banners and slogans were suspended in the center and on the main road of the village, and GP articles were published in the Hai Duong provincial Technical and Science Bulletin.
- GP activities have been disseminated through the mass media of the commune and province.
- 2,000 brochures and posters on GP activities and an environmental promotion manual were issued.
- A study mission to other GP villages was undertaken to gain knowledge and share experiences.
- A GP competition was organized with the participation of more than 100 people.



❖ **Thang Thanh village, Truong Yen commune, Ninh Binh province**

GENERAL INFORMATION

Thang Thanh village implemented GP programs during 2000 and 2003 under the GP Integrated Community Development Program.

Thang Thanh village in Truong Yen commune is located in the old capital city. It is home to the historic ruins of the Temple of Dinh Le King.

Thang Thanh is in the west Hoa Lu district, approximately 93 km south of Hanoi. The Sao Khe River runs through this village. Some characteristics of the village are as follows:



Thang Thanh village, Truong Yen commune, Ninh Binh Province

Total area: 22.38 ha
Cultivated area: 14.12 ha <ul style="list-style-type: none"> ○ Farm produce area: 8.74 ha ○ Low-lying land area: 5.38 ha Residential area: 8.26 ha
Population: 1,200 people in 285 households
Average income: VND2,800,000 /person/year
Main production activities:
Cultivation: 93% of the village's total income Other: Embroidery, stone cutting, breeding pigs, poultry, developing tourism, and extracting limestone.

The average area cultivated by an individual is about 400 m². However, productivity is very low (5.4 – 5.6 tons/ha/year of rice). Villagers can increase their income and thus improve their quality of life by breeding pigs and poultry, developing tourism, and quarrying limestone for export.

MAIN ISSUES

- Poor water quality was the predominant problem for people within Thang Thanh village. Thang Thanh had neither a regular water supply system nor water drainage. The main source of potable water is rain and groundwater from a well. In the dry season, the well often dried up, resulting in limited water availability for domestic and drinking needs. In the wet season, polluted floodwater entered the well and contaminated the drinking water.
- The sewage management system was inadequate. There were few septic tanks in the village; concrete containers were used to store sewage. Once full, the contents of these containers were used as compost in fields and household vegetable gardens.
- The village lacked a solid waste collection system. The villagers often disposed of their waste in their gardens, rivers, or ponds.
- Households used wood excessively in their traditional stoves for cooking.
- Farmers depended heavily on chemical fertilizers for their fields. The average application rate was about 20 kg of phosphate fertilizer, 3 kg of potassium fertilizer, and 8 – 10 kg of nitrogenous fertilizer/crop/360 m². The amount of chemical fertilizer applied was continuously increasing. The soil was acidic.
- The use of pesticides was not according to the guidelines provided by the manufacturers. Some households applied pesticides themselves without the control of the cooperative. The cooperative is responsible for cultivation activities in the village.
- Bottles that contained chemicals were not being correctly disposed of and were often left in mountain caves.

GP OPTIONS

- (1) Set up village-specific environmental regulations and educate the villagers on environmental management including wastewater treatment, potable water, and environmental regulations;
- (2) Construct a water supply plant capable of supplying potable groundwater for 50 households;
- (3) Construct a countercurrent water filtration model;
- (4) Construct septic tanks, biogas plants, and composting pits to treat sewage;
- (5) Construct a wastewater treatment system in each household to prevent polluted wastewater from being discharged directly into ponds or streams;
- (6) Set up a solid waste collection and management system;
- (7) Construct energy-efficient stoves to reduce energy consumption and air pollution;
- (8) Apply IPM to cultivated areas to reduce the reliance on chemical fertilizers and pesticides; and
- (9) Undertake traditional career development.

IMPLEMENTATION AND RESULTS

In 2000 – 2001:

- GP Training Activities:
 - Training courses on GP methodology were organized and attended by over 200 people.
- GP Option Activities:
 - A water supply plant was installed to pump and filter groundwater for potable purposes. This plant is capable of supplying potable water for 50 households. In addition, a water treatment plant was established for households unable to connect to the water supply plant. This plant provides households with simple filtration systems capable of making their water suitable for drinking as per the 505/BYT Potable Water Quality Standard (Ministry of Health).
 - Four wastewater treatment systems were constructed within different households.
 - Five biogas plants and a compost pit (2 m³) were constructed. EMONY, a biological product used to increase the speed of composting and to reduce odors, was added to the biogas plants and the compost pit.
 - Three two-compartment latrines and four one-compartment latrines were built.
- GP Promotional Activities:
 - The villagers established regulations for environmental protection. They were informed of these regulations through radio, newspapers, and posters and also at festivals.
 - A competition was organized for GP. Hundreds of people from the Hoa Lu district attended. This helped increase environmental awareness among the villagers.

In 2002 – 2003:

- GP Training Activities:
 - A training course was organized on sedge work for 60 people.
 - 24 villagers attended a training course on embroidery over 45 days to learn about embroidery spade production. This production is aimed at tourists traveling through the village.



GP competition at village

○ GP Option Activities:

- 98% of villagers can now access clean water.
- 90% of villagers have hygienic latrines.
- Thirty-one dustbins were distributed throughout the village and a landfill was constructed.
- Four biogas plants were constructed.
- Four counter current water treatment models were constructed.
- Four wastewater treatment pits were installed.
- 11 energy-saving stoves were built.



Waste collection



❖ **Thanh Vinh 1 quarter, Tho Quang ward, Da Nang**

GENERAL INFORMATION

The Thanh Vinh quarter of Da Nang implemented GP as a part of the GP-ICD project.

Thanh Vinh is located approximately 7 km northeast of Da Nang. The eastern boundary of Thanh Vinh 1 is Thanh Vinh 2, the western boundary is Man Quang 2, the northern boundary is Son Tra Mountain and the southern boundary is Loc Phuoc 4. Some characteristics of the village are as follows:



Thanh Vinh 1 quarter, Tho Quang ward, Da Nang

Total amount of land: 52.5 ha
Cultivated land: 33.7 ha, including <ul style="list-style-type: none"> ◦ Vegetable plantation: 19.4 ha ◦ Lowlands used for rice cultivation: 14.3 ha. Tenure lands: 18.8 ha
Population: 2,457 people in 546 households
Average income: VND4,800,000 /person/year
Main production activities
Agriculture: All of the total income

MAIN ISSUES

- Polluted ground water;
- Inappropriate management of domestic waste, human waste, and animal waste, which led to environmental pollution that affected the landscape of the ward and community health problems; and
- Ineffective using of fuel.

GP OPTIONS

- (1) Construct hygienic latrines and encourage people to construct at their own houses;
- (2) Construct appropriate pig facilities;
- (3) Construct a biogas plant to treat human and animal waste;
- (4) Propagate and promote enhanced awareness of environmental protection among people in the ward;
- (5) Upgrade the road system and collect domestic waste;
- (6) Construct an area for domestic waste treatment;
- (7) Clean the whole ward once a month;
- (8) Construct a plant for storing the animal waste;
- (9) Construct an energy-saving cooking stove;
- (10) Develop local careers by transferring technology such as bee breeding, worm breeding, and mushroom cultivation;
- (11) Construct a simple water filter model for the community; and
- (12) Set up an administration management system for environmental protection.

IMPLEMENTATION AND RESULTS

- GP Training Activities:
 - Training courses to enhance the environmental awareness of people were organized, such as: management and treatment of solid waste, introduction to biogas plant and hygienic latrine models, how to treat wastewater and drinking water; how to save energy. There were 30 participants at each course.
- GP Option Activities:
 - A GP team has been set up.
 - Two hygienic latrines were constructed.
 - Two energy-saving cooking stoves were constructed.
 - The technology of a worm-breeding model was introduced and transferred to households.



Installing a biogas plant

- A 8 m³ biogas plant was constructed.
- GP Promotional Activities:
 - GP promotional activities were organized such as: mass media, campaigns, posters, slogans and cleaning up whole the quarter.
 - A competition for GP was organized.



Ward clean-up in progress



❖ **Phuoc Kieu village, Dien Phuong commune, Quang Nam province**

GENERAL INFORMATION

Phuoc Kieu village implemented GP in 2002 under the GP Integrated Community Development Program.

Phuoc Kieu village is located in the Dien Phuong commune of Quang Nam province. The western boundary of Phuoc Kieu is National Highway 1A, the northern and southern boundaries are Dien Minh village, and the eastern boundary is Thanh Chiem village. Some characteristics of the village are as follows:



Phuoc Kieu village, Dien Phuong commune, Quang Nam province

Total area: 45.9 ha
Cultivated area: 31.2 ha ○ Farm produce area: 23.8 ha ○ Low-lying land area: 7.4 ha Residential land: 14.7 ha
Population: 380 people in 70 households
Average income: VND2,400,000 /person/year
Main production activities:
Production: Bronze casting Other: Agriculture and services

MAIN ISSUES

- 98% of villagers used water from bore wells, although the water was polluted with iron.
- There were no drainage systems in the village. Waste water from domestic and animal breeding facilities was discharged into the gardens, ponds, and road.
- There was no solid waste collection system in the village. Solid waste was disposed of in gardens or ponds.
- Human and animal waste disposal methods were inappropriate. Given that 20% of households did not have latrines, the villagers disposed of waste along the roads or in gardens.
- The wastewater drainage system was limited. Wastewater from domestic use and animals was directly discharged into public ponds or onto the land, resulting in high pollution of both ground and surface water by organic matter. This water was used without any treatment.
- The villagers were unaware of environmental protection.
- The bronze foundry mainly used charcoal and diesel oil for burning without chimneys or personal protective equipment, such as safe working clothing, which caused health and environmental pollution.

GP OPTIONS

- (1) Improve bronze casting technology;
- (2) Establish a solid waste collection system;
- (3) Construct hygienic latrines;
- (4) Construct wastewater pits for treatment before discharging to outside environment; and
- (5) Improve bronze casting technology to reduce material costs.

IMPLEMENTATION AND RESULTS

- GP Training Activities:
 - A training course on GP methodology was organized and attended by over 100 people.
- GP Option Activities:
 - A solid waste collection system was established.
 - 20 latrines were built. This helped to reduce the amount of sewage being disposed of to roads and gardens.
 - Nine biogas chambers using plastic bags were installed. These solved many human and animal waste disposal problems.
 - Three energy-efficient stoves were constructed to reduce



Solid waste collection equipment

energy consumption and air pollution.

- Four water filtration systems were constructed to provide clean water for the village.
- Three wastewater treatment pits were built in different households.
- Environmental regulations were established and all households now follow these regulations.

○ GP Promotional Activities:

- 11 posters on GP and environmental protection were designed and printed.
- A sign reading “Phuoc Kieu Green Productivity Village” was installed at the village entrance.



- Loudspeakers have been utilized to educate people on environmental protection.
- Two information boards on regulations for environmental protection were set up.
- A GP competition was organized to enhance environmental awareness among the villagers.

“Phuoc Kieu Green Productivity Village” sign



❖ **Konhrachot village, Kon Tum town, Kon Tum province**

GENERAL INFORMATION

Konhrachot village implemented GP in 2002 under the GP Integrated Community Development Program. Konhrachot village is one of nine villages of Kon Tum town. The village is situated by the DakBla River and is the site of residence for the Banar people. Some characteristics of the village are as follows:



Konhrachot village, Kon Tum town, Kon Tum province

Total area: 105 ha
Cultivated area: 24.54 ha Milpa land: 54.34 ha Residential land: 26.12 ha
Population: 1,318 people in 191 households
Average income: VND2,300,000 /person/year
Main production activities:
Cultivation: 92% of the village's total income Other: Livestock breeding

MAIN ISSUES

- The lack of drainage system and low topographic location meant that almost all of the wells in the village were polluted. Almost 70% of the wells were contaminated with iron.
- Environmental pollution occurred as a result of traditional techniques and customs, such as cow breeding under the floor, the lack of facilities to breed pigs, and the tendency to let them live unbridled.
- Many villagers did not use toilets, and the percentage of households with toilet facilities in the village was very low (only 10 to 15%), leading to environmental pollution and disease.
- Domestic waste, residue agricultural products, and animal and human wastes were not collected and treated.
- The inappropriate use of chemical fertilizers and pesticides on vegetables produced unsafe vegetables for consumers.

GP OPTIONS

- (1) Enhance the awareness of the need for clean water and encourage villagers to use fresh water;
- (2) Improve and update wells, and construct a simple water filtration model;
- (3) Propagate to the villagers the importance of clean breeding facilities and move cow stables to the outside of their houses;
- (4) Support the construction of the advanced latrine model; and
- (5) Provide training and practice for the safe cultivation method of vegetable (IPM).

IMPLEMENTATION AND RESULTS

- GP Training Activities:
 - Training courses on GP methodology were organized for the local project coordinator and GP team;
 - Training on IPM was given to 25 households who cultivate vegetables.
 - A training course on environmental awareness and GP practice was conducted with 300 attendants.
 - Training sessions on waste management, the usage of hygienic water, wastewater, and the advanced latrine model were conducted.



Training course on GP methodology for GP teams

○ GP Option Activities:

- 35 households, who bred cows under their homes, moved the breeding facilities outside the house. This model indicates the successful results of the project, as 100% of households in the nine villages of Kon Tum town have moved their cow stables to a safe distance from their house.
- Two fixed cow stables with area of 240 m² were constructed.
- 43 households have constructed sanitary cow stables using their own funds;
- 60 latrines were constructed. Finance was provided for the construction of 20 latrines,



Cow stable

although funding for the additional 40 latrines was contributed by villagers. Ten households have constructed their own latrines. As a result of these new facilities, the use of latrines increased from 15% before the project to 80% upon completion.

- Three wells were upgraded, one additional well was built, and 3 water treatment models were constructed at the household level.
- The safety cultivation method was applied by 25 households over an area of 0.5 ha of vegetables. This helped to provide knowledge on IPM and reduce the inappropriate use of pesticide and chemical fertilizer.
- 12 composting models were built and 50 villagers have attended training courses on composting.
- A drainage system was constructed.

○ GP Promotion Activities:

- Established a promotion campaign on mass media, i.e., TV and radio;
- Study missions on GP practice organized;
- Environmental regulations of the village established;
- Environmental activities were promoted at the village's meeting every Sunday morning to encourage the villagers to participate to the program.



❖ **Xuan Thoi Thuong village, Hoc Mon district, Ho Chi Minh**

GENERAL INFORMATION

Xuan Thoi Thuong is located southwest of Hoc Mon district, about 7 km from Hoc Mon town. The northern boundary of Xuan Thoi Thuong is Xuan Thoi Son village, the southern boundary is Vinh Loc village, the eastern boundary is Ba Diem, and the western boundary is Pham Van Hai state-run farm. Some characteristics of the village are as follows:



Xuan Thoi Thuong village, Hoc Mon district, Ho Chi Minh

Total amount of land: 1,856 ha, comprising
Cultivated land: 1,543 ha
Specific land: 313 ha
Population: 17,978 people in 3482 households
Average income: VND4,130,000 /person/year
Main production activities:
Agriculture: 85% of the total income
Other: Small-scale industry, breeding

MAIN ISSUES

- Solid waste and sewage was discharged directly into fields, ponds, and lakes through the drainage system.
- Animal waste was used as a fertilizer and for fish breeding without treatment, which polluted the environment.
- Chemical fertilizers and pesticides were used in large quantities. Bottles and packing that contained chemicals were not properly treated.
- There was no solid waste collection system within the village. The villagers often disposed of their waste in empty areas of land or by burning, which resulted in environmental pollution and poor aesthetics.

GP OPTIONS

- (1) Replace nonstandard latrines with standard latrines and build two-compartment latrines;
- (2) Apply a simple filtration method to remove pollutants from well water;
- (3) Construct a water supply plant for residential areas;
- (4) Install and upgrade a drainage and canal system;
- (5) Apply biogas technology for human and animal waste treatment;
- (6) Establish a solid waste collection system and manage pesticide containers;
- (7) Install animal waste treatment pits in each household;
- (8) Use IPM and natural farming to reduce the utilization of pesticide and chemical fertilizers;
- (9) Conduct training courses on biogas construction techniques, environmental hygiene, etc; and
- (10) Organize a study mission to share best practice experiences with other villages.

IMPLEMENTATION AND RESULTS

- GP Option Activities
 - 150 hygienic latrines for 150 households were built.
 - 40 biogas chambers were constructed.
 - Two worm rearing models were tested.
 - 40 dustbins were distributed throughout the village and a solid waste collection team was established.
 - One closed waste treatment system and two animal waste treatment pits were constructed.



Worm rearing



Training course on natural farming

- 600 people were organized.
- Promotions and campaigns were organized to raise the awareness of the importance of clean water and the collection of chemical containers from the field.

○ GP Training and Promotion Activities:

- Two training courses on environmental protection were conducted. These were attended by 100 villagers.
- Nine training courses on environmental hygiene and prevention of diseases were undertaken with the participation of 450 people.
- 20 training courses on safe vegetables and natural farming for



❖ **An Thanh village, Mo Cay district, Ben Tre province**

GENERAL INFORMATION

An Thanh village implemented GP in 2002 under the GP Integrated Community Development Program. An Thanh is located in a brackish water area and is inundated with salty water from January to March every year. It is located in Mo Cay district, approximately 20 km southwest of Ben Tre. Some characteristics of the village are as follows:



An Thanh commune, Mo Cay district, Ben Tre province

Total amount of land: 1,365 ha.
Cultivated land: 1,149 ha, comprising <ul style="list-style-type: none"> ○ Rice cultivation land: 589 ha ○ Vegetable plantation land: 480 ha ○ Potential land for aquatic production: 80 ha ○ Other land: 216 ha
Population: 12,890 people in 2,985 households
Average income: VND4,050,000 /person/year
Main production activities:
Agriculture: 90% of the total income Other: 10% from various services

MAIN ISSUES

- Potable water was limited and polluted. In the rainy season, 22% of households used rain water. In the dry season, 30% of households used river and pond water. However, the water was polluted and salty in one to three months per year. Only 7.2% of households used potable water.
- Solid waste was discharged to gardens and ponds. There was no solid waste collection system in the village.
- Only 20% of households had access to hygienic latrines. Human waste was generally discharged directly into ponds and lakes. This caused serious environmental and health hazards.
- The village lacked an adequate drainage system, and the inhabited zone usually overflowed in the wet season.

GP OPTIONS

- (1) Enhance environmental awareness of people through training and promotion;
- (2) Organize training courses on GP technologies suitable for the commune;
- (3) Set up a solid waste collection and management system;
- (4) Introduce a simple water treatment technology to provide clean water for the commune; and
- (5) Plantation of appropriate crop varieties with high economic value.

IMPLEMENTATION AND RESULTS

- GP Training Activities:
 - A training course on clean water treatment techniques was conducted for 36 households who applied this option in their own homes.
 - Training courses on the plantation of clean orange trees and shrimp cultivation were conducted
 - Training courses on cultivation techniques for high-yield corn were offered.
- GP Option Activities:
 - 36 water treatment models were built in the commune;
 - A pilot plantation of clean oranges was started on 20 ha managed by 93 households. This new technique can increase productivity by 1.5 to 2 times compared with the traditional method and reduces pollution caused by pesticide application.
 - High-yield corn was planted on 15 ha for 26 households.



Clean oranges

○ GP Promotion Activities:

- Three banners were set up to promote GP in the commune.
- A video on GP implementation was produced which was shown on television at the provincial level.
- GP was publicized through local newspapers.



GP banner



❖ **Phuoc Hanh village, Phuoc Hau commune, Vinh Long province**

GENERAL INFORMATION

Phuoc Hanh village implemented GP during 2001 and 2002 under the GP Integrated Community Development Program. Phuoc Hanh is located 4 km south of Vinh Long town and lies on an important water and land traffic line, where the Doi Ho River is connected to the Tien River, Hau River and National Highway 1A. Some characteristics of the village are as follows:



Phuoc Hanh village, Phuoc Hau commune, Vinh Long province

Total amount of land: 150 ha
Cultivated land: 137 ha, comprising <ul style="list-style-type: none"> ○ Rice cultivation: 60.2 ha ○ Land containing fruit and vegetable gardens: 10.6 ha ○ Potential land for aquatic production: 66.2 ha
Specific land: 13.6 ha
Population: 2,098 people in 395 households
Average income: VND3,000,000 /person/year
Main production activities:
Agriculture: 217 households are involved (54.8%)
Construction: 88 households are involved (22.3%)
Commerce: 90 households are involved (22.9%)

MAIN ISSUES

- Surface and groundwater pollution due to the direct discharge of untreated sewage into rivers and drains caused numerous environmental and health problems.
- During the flood season there was a lack of clean water for domestic activities.
- The application of chemical pesticides and fertilizers was inappropriate and resulted in an increase in environmental degradation through water pollution.
- At the village, a breeding branch was developed but almost no sewage was collected and treated before discharging into the environment. This caused groundwater pollution and epidemic diseases.
- The population had a low level of environmental protection awareness, which led to a generally poor state of the environment.

GP OPTIONS

- (1) Conduct training courses on GP methodology, solid waste management, IPM, mushroom cultivation, worm-rearing techniques, biogas, and composting methodology;
- (2) Construct a biogas plant to treat the human and animal waste;
- (3) Apply clean vegetable production models;
- (4) Apply IPM techniques on rice fields to limit the use of chemical fertilizers and pesticides;
- (5) Introduce a composting technique for sewage to reduce waste and increase the quality of soil where compost is applied;
- (6) Implement worm rearing to make use of animal waste;
- (7) Apply different water treatment techniques, such as water treatment powder and a simple filtration water treatment model, to provide clean water for villagers;
- (8) Construction a plastic bag biogas model;
- (9) Set up a collection and classification system for solid waste within individual households so that separated solid waste can be treated by composting, recycling, or reusing.

IMPLEMENTATION AND RESULTS

- GP Training Activities:
 - A training course on GP concepts and methodologies was organized.
 - A training course on IPM was organized with the participation of 80 people.
 - A training course on safe vegetable plantation was organized with the participation of 80 people.
 - Two training courses on composting were organized with the participation of 120 people.



IPM training course

- Training courses were conducted on GP concepts and methodologies, IPM techniques, natural farming, worm-rearing techniques, biogas, and composting methodologies.

- GP Option Activities:

- 10 biogas plastic bag models were constructed. These solved human and animal waste disposal problems.
- 1,000 packages of water treatment powder were distributed to the villagers. 20 simple water treatment models were constructed which increased the number of people accessing clean water; and a pilot solid waste classification system was implemented for 60 households.
- 10 households implemented composting techniques and five households applied worm rearing practices.



Biogas plastic bag

- GP Promotional Activities:

- Information relating to the GP program was publicized on notice boards, radio, and newspapers of the village and province.