
INTRODUCTION

ASIAN PRODUCTIVITY ORGANIZATION AND GREEN PRODUCTIVITY PROGRAMS

The Green Productivity (GP) concept was established in 1994 by the Asian Productivity Organization (APO) 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 socio-economic development while ensuring environmental protection. It applies environmental management tools, techniques, and technologies to reduce the impact of an organization's 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. Internationally, GP programs have been applied to industrial and service sectors. Vietnam is the first country to implement GP at the community level.



GP PROGRAMS IN VIETNAM

Since 1998, the Vietnam Productivity Center (VPC), under the Directorate for Standards and Quality (STAMEQ), has been successfully implementing GP projects in community groups in Vietnam. Given that the majority of GP projects in other APO member countries have been implemented in industrial sectors and agricultural farms, Vietnam was the first country to implement the GP concept in community groups. As such, it was expected that the VPC would have several problems such as a lack of people with GP expertise in community groups and limited awareness of the Vietnamese villagers of GP concepts and techniques. The GP program in Vietnam is, therefore, different from those in other APO member countries as far as the nature and scope are concerned.

Projects implemented by the VPC have been completed with financial support from the APO. Other organizations throughout Vietnam, including various provincial Departments of Science, Technology and Environment (DOSTEs), have also supported the VPC and contributed to GP projects. In addition, many institutions have provided technical assistance, and local authorities and villagers have contributed to the implementation of projects. The combined efforts of all these organizations have made GP projects in Vietnam a success.



The first community project implemented by the VPC was the GP Demonstration Program (*SPE-GPDP-98*). During 1998 and 1999, this project applied GP in three villages: Tinh Loc and Kha Ly Ha villages in the Viet Yen district of Bac Giang province, north of Hanoi; and My Khanh B village in the Cu Chi district of Ho Chi Minh City.

Through the GPDP project, the environmental conditions and living standards of the villagers have improved by implementing options such as utilization of biogas technology to manage human and animal waste, construction of centralized water supply plants to provide clean water to villagers, and the application of integrated pest management (IPM) to reduce the amount of pesticide and chemical fertilizer used.

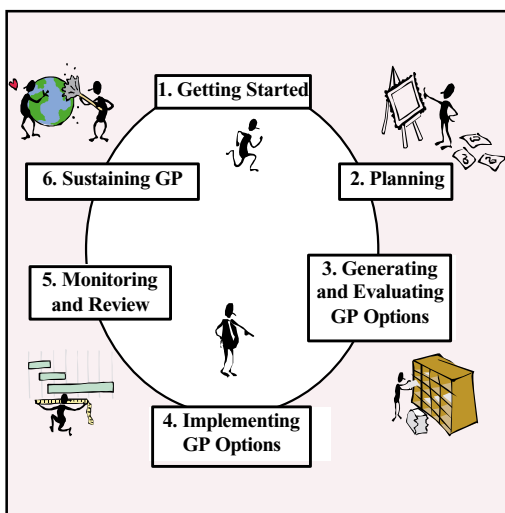
After evaluating the success of the first GPDP project, the program was initially expanded to three villages during 2000 and 2001 under the GP Development Assistance program. In addition, another eight villages implemented GP through 2000 and 2001 under the GP Integrated Community Development program. To date, there are eleven villages that have implemented GP. The VPC has currently received requests to implement GP in sixty villages covering twenty-one provinces throughout Vietnam. GP programs will be implemented in these villages during 2001-2002.

The objective of the GP program in Vietnam is to improve the environmental and socio-economic situation of communities and then to expand GP into the industrial sector. The approach within industries is to integrate GP with an environmental management system (EMS) such as ISO 14000. Currently GP is being implemented in two cement factories at Sai Son and Hoang Thach in Vietnam. The action plan of the VPC aims to have forty enterprises applying GP in 2003.

In addition, the VPC has conducted training courses to promote and expand the GP concept throughout Vietnam. These training courses taught participants about GP tools and techniques. Participants in training courses included consultants, staff from different companies and departments, and people from research institutes.

Given that Vietnam is the first country to apply GP at the community level, the results and experiences from GP projects there will help other APO member countries to implement GP programs at the community level.

OVERVIEW OF GP METHODOLOGY, TOOLS AND TECHNIQUES



The GP methodology consists of six primary steps with various tasks associated with each step (Table 1).

Step 1: Getting Started

Task 1 : GP team formation

This task involves forming a GP team that includes members from the village and supporting organizations such as the DOSTE.

Task 2: Walk-through survey and information collection

This task incorporates gathering information and data on the village and then undertaking a survey of the village to

identify problem areas and possible options for solutions. The survey is undertaken by the GP team and information recorded in a database for future reference.

Tools and Techniques

At the start of the GP process, flowcharts and process flow diagrams provide graphic representation of activities, processes, and material flow. A material balance may also be utilized, based on the process flow diagram, allowing for the quantitative assessment of material inputs and outputs.

Step 2: Planning

Task 3: Identifying problems and causes

When undertaking the walk-through survey, environmental (e.g., poor water quality), technical (e.g., no wastewater drainage infrastructure), and/or financial (e.g., lack of by-trade) problems and their causes are identified.

Task 4: Setting objectives and targets

When all the problems and their causes have been identified using an Ishikawa diagram, objectives and targets are set to address the problem areas. Performance indicators are also identified.

Tools and Techniques

Benchmarking is used to identify areas that can be improved by comparing the current status of a village to that of other villages. The GP team uses brainstorming to identify the possible causes of the problems. Ishikawa cause-and-effect analysis is another tool used to identify the reasons behind the problems. It is a diagram that illustrates the causes of problems and their effects, thus allowing a problem to be fully analyzed.

Eco-mapping may also be used to identify environmental problems. This is a simple and practical visual tool that provides a bird's-eye view of a village's operations, practices, and problems.

Checklists are used for collecting data over time to show trends and recurring problems. The information from these checklists is then stored in a village database.

Table 1: GP Steps, Tasks, and Tools

| Steps | Tasks | Tools and Techniques |
|--|---|--|
| Step 1. Getting Started | 1. Form a GP team 2. Walk-through survey and information collection | -Brainstorming -Benchmarking -Checklist -Flowcharts and process flow diagram |
| Step 2. Planning | 3. Identification of problems and causes 4. Setting objectives and targets | -Brainstorming -Cause-and-effect analysis (Ishikawa) -Eco-mapping -Material balance |
| Step 3. Generation and Evaluation of GP Options | 5. Generation of GP options 6. Screening and evaluation of GP options 7. Preparation of implementation plan | -Brainstorming -Cost-benefit analysis |
| Step 4. Implementation of GP Options | 8. Implementation of selected options 9. Training, awareness building, and developing competence | -Training -Responsibility matrix |
| Step 5. Monitoring and Review | 10. Monitoring and evaluation of results 11. Management review | -Prepare monitoring program -Audits -Solution effect analysis -Failure mode and effect analysis |
| Step 6. Sustaining GP | 12. Incorporate changes 13. Identify new/additional problem areas for continuous improvement | The tools are repeated here, since the activities are looped back to the previous steps |



Step 3: Generation and Evaluation of GP Options

Task 5: Generating GP options

Options are developed to meet the objectives and targets set in the planning stage.

Task 6: Screening and evaluating GP options

After generating GP options, they are screened and prioritized under the following aspects:

- Environmental
- Technical
- Financial
- Social

Task 7: Formulating GP implementation plan

The GP team then formulates an implementation plan to implement the suitable options selected in Task 6.

Tools and Techniques

GP options are generated and assessed using techniques such as brainstorming and cost-benefit analysis. This facilitates the comparison of options in terms of their monetary costs and the net benefits that can be obtained.

Step 4: Implementation of GP Options

Task 8: Training, awareness building, and developing competence

Training is provided to the GP team that imparts information about GP methodology as well as information on environmental aspects and methods to improve environmental management for the overall improvement of the living standards of the villagers. Issues such as solid waste management, importance of clean, potable water, human and animal waste management, and air pollution management are all included in the training programs.

Task 9: Implementing selected options

The GP team implements the options generated in Task 6.

Tools and Techniques

Options may encompass both simple and more complex changes, such as replacing inefficient traditional stoves with new, more efficient stoves to increase fuel efficiency and reduce air pollution, recycling manure and sewage for use as energy sources in biogas plants, waste stream segregation and the promotion of recycling, and reuse and recovery to reduce the amount of waste a village produces and improve waste disposal.

Step 5: Monitoring and Review

Once the selected GP options have been implemented, it is very important to check whether they are producing the desired results. This involves monitoring the overall GP system to ensure that it is proceeding in the right direction and that targets are being achieved as per the implementation plan. This step consists of two tasks:

Task 10: Monitoring and evaluation of results

The overall GP system is monitored by the VPC and the GP team to ensure that the program is proceeding in the right direction.

Task 11: Management review

Findings of monitoring and evaluation (Task 10) are reported for management review.

Step 6: Sustaining GP

Task 12: Incorporating changes into the community's system of management

A GP program should become a part of the community's daily activities. The support from local authorities and villagers is very important for sustaining a GP program at the community level.

Task 13: Identifying new/additional problem areas for continuous improvement

All the above steps can be applied for any new problem areas that may arise within a community/organization. Therefore, GP is a process of continuous improvement.