

Assessment of Green Productivity Implementation and Needs of Member Countries



ASIAN PRODUCTIVITY ORGANIZATION

First published in Japan
by Asian Productivity Organization
Leaf Square Hongo Building 2F
1-24-1 Hongo, Bunkyo-ku
Tokyo 113-0033, Japan
www.apo-tokyo.org

© 2014 Asian Productivity Organization

The views expressed in this publication do not necessarily reflect the official views of the Asian Productivity Organization (APO) or any APO member.

All rights reserved. None of the contents of this publication may be used, reproduced, stored, or transferred in any form or by any means for commercial purposes without prior written permission from the APO.

Table of Contents

EXECUTIVE SUMMARY.....	2
INTRODUCTION	5
BACKGROUND INFORMATION	7
OBJECTIVES OF THE STUDY.....	12
SCOPE AND METHODOLOGY	12
STAKEHOLDERS AND THEIR INVOLVEMENT IN GP PROMOTIONS.....	16
Status of Implementation of GP	21
General Findings.....	21
Sector-Specific Findings.....	33
Industry	36
Service	40
Results on Assessment of Needs of Member Countries	43
General Findings.....	44
Sector-Specific Findings.....	49
Industry	51
Services.....	54
Conclusion and Recommendations	56
Recommended Actions/Activities for COE-GP/APO/NPOs.....	57
Sector-Specific Recommendations.....	64
Proposal of Concrete Action Plan.....	69
COE-GP's 2014-2018 Action Plan	70
References	75
List of Experts.....	76

EXECUTIVE SUMMARY

This report presents the findings from the research and assessment of Green Productivity (GP) needs for Asian Productivity Organization's (APO's) member countries, conducted for APO's Center of Excellence on Green Productivity (COE-GP) during the second half of 2013. National experts from 13 APO member countries participated in this research, using the Rapid Assessment (RA) methods and based mostly on questionnaire surveys and stakeholder meetings. The stakeholder meetings were conducted after the questionnaire surveys to confirm the survey findings, and to seek additional comments and recommendations from stakeholders.

The participating national experts were given a six-month period during the second half of 2013 to conduct this Assessment Study, and then submitted their country reports to be consolidated by the Chief Expert of this project. The experts agreed to focus on three sectors in their studies: agriculture, industry and service. The consolidated findings from the country reports are organized in this report into the following chapters: Introduction, Background Information, Objectives, Scope and Methodology, Stakeholders involved in GP Implementation, Status of GP Implementation (general and sectoral practices and issues), Assessment of Needs of Member Countries (general and sectoral needs), and Conclusions/Recommendations.

The member countries' recommendations are categorized into four areas in this report:

1. **Capacity building:** Develop training manuals, courses, best GP practices, case studies/examples; and offer training courses, workshops and seminars to both GP consultants and the businesses disseminating GP knowledge and practices.
2. **Awareness building:** Raise GP awareness of the businesses' management, government policymakers, consumers and environment groups, and the general public, using approaches such as spreading GP messages through the media, management meetings, or linking with environmental and sustainability awareness activities.

3. **Promotion of GP adoption:** Conduct pilot GP projects or develop demonstration GP organizations; the knowledge from examples and case studies of these projects can add to the GP knowledge base for the capacity building efforts.
4. **GP Networking:** Networking can be instrumental in locating existing GP technologies and experiences, and transferring suitable GP knowledge without the efforts of repeating previous work. However, the knowledge may need to be modified to suit local circumstances or converted into local languages to help with knowledge dissemination.

As many of the tasks described in the report have already been practiced in several member countries, this report suggested member countries should seek opportunities to learn from past experiences, therefore maximizing the potential benefits in other member countries without repeating existing efforts. The following recommendations for COE-GP are also provided:

1. **Help develop GP training manuals, case studies and promotional material suitable for member countries lacking such resources.** This may involve identifying the member countries in need of such assistance, and developing or modifying existing training material so it is suitable for individual and specific needs.
2. **Help develop demonstration/pilot projects and model organizations in member countries with such needs.** It is important to identify member countries that need this kind of assistance the most, and conduct cost-benefit analysis to achieve maximum impacts of such projects.
3. **Develop a network of GP knowledge and capacity.** The focus should be on using existing successful experiences to develop local networks in member countries. This will allow all networks to link together, along with APO, in order to share GP knowledge.
4. **Conduct training courses, workshops and seminars.** COE-GP should be able to gather existing GP knowledge and resources, and disseminate such knowledge through GP training courses, workshops and seminars in member countries with such needs.

1. **Building GP awareness through the above actions.** COE-GP's actions may be conducted alongside promotional drives through mass media, or to targeted private sector stakeholders and policymakers.

Taking into account the GP needs of member countries summed up in this report, the COE-GP has prepared a short-term (2014–2018) proposal including the following:

1. **Continued operation of the Asian Green Productivity Exchange Platform.** This is the platform on which all COE-GP actions and activities are launched, and it manages all COE-GP's administrative affairs. The platform consists of:
 - a. COE-GP Advisory Committee: this committee is tasked with providing policy direction to COE-GP through meetings at least twice a year.
 - b. COE-GP Office: this office is responsible for coordinating and managing all of COE-GP's daily affairs and related projects.
 - c. Technical group meetings: these groups of experts provide COE-GP with the necessary technology information and technical policy inputs.
2. **Establish Asian Green Productivity Team.** Each team will consist of at least four experts, and the teams will provide assistance to at least eight member countries in four focused technology areas: resource recycling, green energy, green factory and ecoagriculture.

3. Promote Asian GP Excellence Benchmarking and Green Leadership

- a. Organize annual International GP Conferences: APO will invite GP experts from member countries and international organizations to attend this annual three-day conference to be held in Taipei.
- b. Organize Green Leaders Benchmarking Workshops/Seminars: five such workshops/seminars will be held each year to gather industry/business leaders and spread the concept of GP benchmarking and green leadership.

4. Enhance Stakeholders' GP Awareness

- a. Green Excellence Enterprise Awards will be presented to model enterprises in three focused sectors capable of demonstrating excellence in pursuing GP.
- b. Establish an APO-GP website offering Chinese and English versions, and a monthly GP newsletter.
- c. Produce additional promotional material, such as press releases, journal articles, promotional features and highlighting project events through print and electronic media.

INTRODUCTION

The APO launched its GP program in 1994, in line with the 1992 Earth Summit recommendations that both economic development and environmental protection would be key strategies for sustainable development. With support mainly from the Government of Japan, the APO has implemented several initiatives to promote GP as a practical way to respond to the challenges of sustainable development.

A lot of the GP knowledge and best practices have been transferred through these initiatives and gained roots in APO member countries. However, after almost two decades since GP was launched, GP-related projects have been dwindling due to the financial constraints of APO, while the economies in Asia have become important parts of the global value chains and the focuses of fast economic growth, as well as the significant contributors to global environment pollution, greenhouse gas emissions, and environmental degradation. This trend has highlighted the importance of intensifying the promotion of GP in order to address such challenges and issues and lay the foundation for building greener economies in the APO region. It has created the need for a dedicated facility to refocus the attention on GP, hence the establishment of APO's COE-GP.

In November 2013, following the decision of APO's Governing Body Meeting (GBM) to approve the recommendation of a Panel of Experts to select the Republic of China (ROC) as the Center of Excellence's host country, the APO's COE-GP was officially launched in Taipei, Taiwan, ROC. One of the first tasks of COE-GP was to determine which actions/initiatives were needed to help the APO member countries promote and implement GP in their respective economies. Thus research entitled, 'Assessment of Green Productivity Implementation and Needs of Member Countries', involving all APO member countries was conducted to serve this purpose.

In response to the needs of this research, a Project Coordination Meeting was held from 20–23 August in Taipei, and 16 national experts from member countries interested in participating in this research attended.

This research was intended to assess the extent and status of implementation and adoption of GP practices in member countries' three focus sectors (agriculture, industry and service), identify emerging areas where GP needs required extra support, and make recommendations as to what actions/initiatives APO and specifically COE-GP should pursue in order to advance the implementation and adoption of GP practices in member countries. As of March 2014, all 16 APO member countries that had national experts attending the August 2013 Project Coordination Meeting had submitted their country reports to the project's Chief Expert for consolidation.

This report starts with the overview of this study's background information, objectives, scope of study and methodology adopted for research. The results of the study are then presented and organized into two chapters on the status of GP implementation and the needs of GP implementation respectively. Each chapter will also discuss the general as well as the sectoral (agriculture, industry and service) information regarding GP implementation status and implementation needs. Finally, the conclusions and recommendations gleaned from country reports on actions for COE-GP to pursue are presented for consideration by COE-GP in deciding its future plan for actions.

The findings and recommendations of this study are expected to serve as the basis for the design of new projects or strengthening the existing GP programs of member countries' NPOs and the APO, as well as to serve as inputs for the COE-GP in updating its two-year plan.

BACKGROUND INFORMATION

APO's Centers of Excellence

During the 50th APO Governing Body Meeting (GBM) held in April 2008 in Tehran, Islamic Republic of Iran, the APO Directors discussed the idea of establishing APO Centers of Excellence (COE). The idea was for COEs to be catalysts for spreading and intensifying the adoption of a body of knowledge and best practices in a particular field or subject related to productivity to complement the efforts of the APO Secretariat.

In 2009, the 51st GBM launched the APO's first Center of Excellence for Business Excellence (COE-BE) and designated SPRING Singapore to host it. In 2013, the 55th GBM approved the recommendations of a Panel of Experts for the ROC to host APO's second Center of Excellence, the COE-GP.

Center of Excellence on Green Productivity (COE-GP)

Following the GBM's approval, the COE-GP Office in ROC was opened in June 2013 in preparation for the organization of this Center of Excellence. On November 5, 2013, the COE-GP was officially launched in a ceremony attended by the ROC's President Ying-jeou Ma, who delivered his remarks to the 300 distinguished government officials, representatives

from foreign representative offices, industrial leaders, scholars and experts who had gathered to discuss the prospect of GP in Asia.

The COE-GP has been established with the support of APO's resources and ROC's inter-ministerial efforts to integrate industry, academia and government agencies. The COE-GP will promote GP best practices through hosting seminars with experts from ROC and abroad, arranging visits at benchmark enterprises, compiling how-to manuals, liaising with domestic and international mass media, participating in international conferences, and publicizing international publications. With these functions in place, resourceful APO member countries will be better equipped to aid other less-advantaged member countries and this would foster improvements in specific domains for better green competitiveness.

Project Coordination Meeting for the Needs Assessment Research

Prior to the official November 2013 launch, COE-GP's first research project 'Assessment of GP Implementation and Needs of MCs' was already underway. The coordination meeting of experts for this project was held between 20–23 August 2013 in the ROC, to discuss the methodology and overall research framework.

The following approaches to the research were adopted during the meeting:

In-country research period: within six months.

Coverage of the research report:

- Review of GP promotion and implementation (focus on the institutional framework, the key institutions/organizations involved).
- Assessment of implementation of GP strategy in agriculture, industry and services (focus on the GP tools and techniques and their level of adoption by companies/enterprises and communities).
- Priority needs of sectors and institutions in member countries to develop and/or strengthen capacities in GP promotion and implementation.

Timeline:

- 1 September 2013: Scoping and preparation
 - Define and contact stakeholders

- Prepare and finalize RA documents
- 15 September 2013: Conduct survey activities
 - Survey activities
 - Primary report preparation
 - Preparation and coordination for stakeholder meeting
- 1 November 2013: Conduct Stakeholder meeting
 - Stakeholder meeting
 - Review stakeholder feedback
- 15 November 2013: Report preparation
 - Report preparation
 - Report submission to Chief Expert, Dr. Ning Yu, ROC

No.	Content	September				October				November			
		W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
1	Identify the advised stakeholders group												
2	Plan for well-organized stakeholders meeting, including master stakeholders, sub stakeholder and public												
3	Organize master stakeholders meeting, identify the GP needs												
4	Data analysis of stakeholders meeting results												
5	Finish report												
6	Submit the final country report to all stakeholders and other concerning organizations/people												
7	Submit the final country report to APO												

Methodology

The method adopted for this research will be the World Bank's Rapid Appraisal (RA) Methods. A brief introduction of the RA methods and approaches are presented below.

Introduction to the Rapid Appraisal Methods adopted for this research

- Due to its advantages of low cost, quick execution, and flexibility to explore new ideas, the RA methods¹ are adopted for this research to gather the views and feedback of beneficiaries and other stakeholders, in order to respond to decision-makers' needs for

1. [http://lnweb90.worldbank.org/oed/oeddoclib.nsf/24cc3bb1f94ae11c85256808006a0046/a5efbb5d776b67d285256b1e0079c9a3/\\$FILE/MandE_tools_methods_approaches.pdf](http://lnweb90.worldbank.org/oed/oeddoclib.nsf/24cc3bb1f94ae11c85256808006a0046/a5efbb5d776b67d285256b1e0079c9a3/$FILE/MandE_tools_methods_approaches.pdf)

information. However, the RA methods also have the disadvantage of relating findings to specific communities or localities, thus making it difficult to generalize, as well as rendering it less valid, reliable and credible than formal surveys.

- In this study, the RA methods will rely heavily on stakeholder meetings, which should be as effective as possible.
- The time required to conduct RA methods is typically four to six weeks, depending on the size and location of the population interviewed and the number of sites observed.

The RA methods can involve the following approaches:

- **Key informant interviews** — a series of open-ended questions posed to individuals selected for their knowledge and experience in an area of interest. Interviews are qualitative, in-depth and semi-structured. They rely on interview guides that list topics or questions.
- **Focus group discussions** — a facilitated discussion among 8–12 carefully selected participants with similar backgrounds. Participants might be beneficiaries or program staff, for example. The facilitator uses a discussion guide. Note-takers record comments and observations.
- **Community group interviews** — a series of questions and facilitated discussion in a meeting open to all community members. The interviewer follows a carefully prepared questionnaire.
- **Direct observation** — use of a detailed observation form to record what is seen and heard at a program site. The information may be about ongoing activities, processes, discussions, social interactions, and observable results.
- **Mini-surveys** — a structured questionnaire with a limited number of closed-ended questions that is administered to 50–75 people. A selection of respondents may be random or ‘purposive’ (interviewing stakeholders at locations such as clinics for a healthcare survey, for example).

Key requirements on implementing RA methods for this research

Key Informant Interview: stakeholders including GP-leading organizations, industry sectors and promotion agencies.

Key categories:

GP promotion:

- Describe the origin of the GP promotion plan.
- What are the organization's GP policy, strategy and program?
- What type of GP plan has there been in the past?
- How does the organization define and engage GP stakeholders?

GP implementation and activities:

- Describe how the organization implements GP.
- What are the challenges or issues in GP Implementation?
- Who are the leaders in GP implementation?
- What type of GP activities are in place?
- What is the scale of GP implementation?

GP results:

- What are the achievements or results of GP?
- What are the benefits?
- What is stakeholder perception and satisfaction like before and after GP?

GP needs:

- What kind of recourse is needed for GP implementation?
- What are the government regulation requirements?
- Which GP-related activities should be enhanced or established?

Outline/Format of the National GP Report

1. Introduction
2. Objectives
3. Scope of GP Research
4. Profile of GP Implementation in a Respected Country
5. Methodology
6. Results and Analysis
7. Conclusion and Recommendations
8. References
9. Appendixes

OBJECTIVES OF THE STUDY

For each participating APO member country, the objectives of this study are the same and can be described as follows:

- Assess the extent of the adoption of a GP approach in the different sectors (focusing on agriculture, industry and service sectors) in the respective member countries.
- Identify the priority needs of the different sectors in member countries in furthering the promotion and adoption of a GP approach.
- Recommend actions for sustainable promotion and adoption of GP in member countries.

SCOPE AND METHODOLOGY

During the project coordination meeting held in August 2013 in Taipei, the experts agreed to adopt the RA methods with two main components: a questionnaire survey to gain responses from stakeholders and a follow-up stakeholder meeting to confirm and verify the survey findings and seek recommendations on the future promotion of GP practices. However, the national experts may choose to adopt the two aforementioned techniques and/or other techniques more appropriate to their national circumstances or organizational budget and resources, such as interviews or direct observation.

As the findings of the RA methods are dependent on the specific stakeholders, communities and localities participating in the study, the scope of methodology adopted for each study from participating member countries is listed below:

Table 1 Scope and Methodology Adopted by Participating Member Countries

Member Country	Content
Bangladesh	RA Method: <ul style="list-style-type: none">▪ Literature review▪ Rapid Appraisal (key stakeholder interviews, structured observations and informal surveys)▪ National consultation meetings

	<ul style="list-style-type: none"> ▪ Stakeholder meetings ▪ Response analysis
Cambodia	Not indicated
Republic of China	<ul style="list-style-type: none"> ▪ Literature review ▪ COE-GP National Experts consultation meetings
Fiji	<p>Approach:</p> <ul style="list-style-type: none"> ▪ National Productivity Organization (NPO) conducted consultations with support from the National Expert (NE). ▪ NPO and NE conducted research and presented findings during a stakeholder consultation meeting. <p>RA method:</p> <ul style="list-style-type: none"> ▪ Stakeholder interviews ▪ Focus group discussion ▪ Direct observation
India	<p>RA Method:</p> <ul style="list-style-type: none"> ▪ Interaction with stakeholders (through personal meetings) ▪ Literature survey ▪ Available data within National Productivity Council (NPC) ▪ Discussions with experts from NPC
Indonesia	<p>RA Method:</p> <ul style="list-style-type: none"> ▪ Planned to hold a stakeholder focus group discussion with stakeholders from the NPO, relevant ministries, real estate developers and domestic companies concerned with green products. However, meeting could not be carried out due to technical reasons. Instead, one-to-one interviews were done through phone calls and emails (with eco-living estates developers, university resource personnel familiar with GP issues, and staff from the Ministry of Environment and Ministry of Industry) <p>Direct observations were also carried out for:</p> <ul style="list-style-type: none"> ▪ eco-village sites (in the Bandung suburban area) ▪ environmentally-sound agricultural practices (SRI system in Garut District) ▪ some industries' water pollution control measures (Bandung City) <p>A literature study was also used to support relevant data on GP</p>
IR Iran	RA method:

	<ul style="list-style-type: none"> ▪ Survey: Primary data obtained through three questionnaires on three groups (senior NIPO officers, CEOs, heads of benefited organizations and policymakers) ▪ Interview: One-to-one interviews with concerned individuals
Laos	Not indicated
Malaysia	RA Method: <ul style="list-style-type: none"> ▪ Questionnaire through emails ▪ Questionnaire also used for on-site observation, and interview at sites of Centrex clients ▪ Views canvassed from GP Consultants (x4), government officials (x3) and private organizations involved in manufacturing and agriculture (x15)
Mongolia	RA method: <ul style="list-style-type: none"> ▪ Views canvassed from MPO, national GP stakeholders, public organizations and NGOs ▪ Review of Stakeholders meeting ▪ Selected three–five companies in each sector (agriculture, industry and service) to evaluate GP implementation levels ▪ Average level of implementation: industry (86.7%), agriculture (66.7%), service (90%)
Nepal	RA method: <ul style="list-style-type: none"> ▪ Design and conduct a questionnaire survey ▪ Conduct a stakeholders meeting ▪ Analyze the responses
Pakistan	RA method: <ul style="list-style-type: none"> ▪ Stakeholder consultations (details not provided)
Philippines	<p>Scope mainly covers Cordillera Region (agricultural), Central Visayas and the National Capital Region (service and manufacturing)</p> RA Method: <ul style="list-style-type: none"> ▪ Consultative/workshop meetings; participants: government agencies/ministries (50%), SMEs and industry associations (35%), NGOs (15%) ▪ Focus group discussions ▪ Mini-survey involving 30 respondents

Sri Lanka	<p>RA Method:</p> <ul style="list-style-type: none"> Conducted a mini-survey via a questionnaire administered to nine organizations in construction, manufacturing, agriculture, services and public sectors This was followed by two stakeholder meetings (September and October 2013) in which over 40 participants from the construction, manufacturing, agriculture and services sectors attended.
Thailand	<p>RA Method:</p> <ul style="list-style-type: none"> Conducted a mini-survey through questionnaire administered to 60 people. Sampled a random selection of respondents: industry (57%), service (38%) and agriculture (5%) <p>Steps:</p> <ul style="list-style-type: none"> Form an advisory group for overall leadership and implementation Prepare the background, objective and timeline information Conduct a survey (quantitative data) or collect information Hold a stakeholders meeting to clarify the information from the survey and to gather more recommendations about GP The survey consisted of three parts: general organization and respondent's information; level of understanding of GP and involvement in green activities; sharing ideas and experiences on improving GP in the organization
Vietnam	<p>Approach:</p> <ul style="list-style-type: none"> SMEDEC 2 invited 40 consultants/experts from consulting, training enterprises, standards, metrology and quality agencies as well as members of the Department of Science and Technology from southern Vietnam to a stakeholders consultation meeting <p>RA Method:</p> <ul style="list-style-type: none"> Literature review Rapid appraisal: used to validate and enhance the preliminary research findings during the stakeholders consultation meeting Survey Questionnaire: administered to 40 experts during the 'Training to consultants/experts on productivity tools' in 2013 organized by SMEDEC 2. Before the meeting, questionnaires were collected for data analysis National consultation meeting on GP: held after the ten-day training course

	with questionnaires collected and information analyzed and presented in the official consultation meeting.
--	--

Findings and comments:

Most participating national experts have adopted the RA methods in their studies to varying degrees, with the questionnaire survey followed by a stakeholders meeting being the most common approach. When the questionnaire surveys were not conducted, the study was based heavily on literature reviews and interviews with stakeholders. In this case, the views of the report authors had more weight in the findings and conclusions of the studies.

The number of participants in the studies ranged from under 20 to over 60, with 20–40 being the most common range. The participants were mostly from the three major stakeholder groups: GP experts/consultants, governmental officials (policymakers), and private organizations (NGOs, SMEs and private organizations). The ratios of study participants also affected the survey results, as sometimes the participants might consist largely of officials from the government or private sector.

For the scope of the study, all national experts were told to limit their studies to three focused sectors: agriculture, industry and service.

It is important to note these differences in the methodologies of the national studies. The report readers need to be aware of the limitations of the RA methods, as their findings can only be related to specific communities, localities or participants of the study. It is difficult to make generalizations based on the findings.

Even with the limitations of RA methods employed for this study, for the purpose of assessing GP needs, and making recommendations for future actions or developing a roadmap for COE-GP, the findings of these country studies should adequately meet the purpose and needs of this project.

STAKEHOLDERS AND THEIR INVOLVEMENT IN GP PROMOTIONS

One of the objectives of the study is to assess the status of GP implementation in member countries, and part of these implementation efforts is linked to stakeholders' involvement in GP implementation. The description of stakeholders in the country reports are summarized as follows:

Table 2: Stakeholders involved in GP Implementation in Member Countries

Member Country	Stakeholder
Bangladesh	<ul style="list-style-type: none"> ▪ National Productivity Organization (NPO) of Bangladesh: Originally the National Centre for Monitoring Labour Productivity, established in 1983 and renamed Bangladesh Productivity Centre in 1987, it became the NPO under the Ministry of Industries in 1989 ▪ NPO has a multidimensional National Productivity Council (NPC)
Cambodia	National Productivity Center of Cambodia
Republic of China	China Productivity Center (CPC)
Fiji	National Training and Productivity Centre (NTPC)
India	<ul style="list-style-type: none"> ▪ National Productivity Council (NPC) was established 1958 to promote and enhance productivity. NPC expanded services to cover energy conservation in the early 1970s, environmental services in the early 1980s, and agri-services in the mid-1980s ▪ GP-related initiatives also taken by other ministries/organizations: ▪ Ministries: Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry, Ministry of Small and Macro Enterprises, Ministry of Power and Bureau of Energy Efficiency (BEE), Ministry of New and Renewable Energy (MNRE), Ministry of Environment and Forests, Ministry of Water Resources, Ministry of Surface Transport, Ministry of Textile, Ministry of Science and Technology, Department of Scientific and Industrial Research, Ministry of Agriculture and Food Processing and Ministry of Rural and Urban Development ▪ NGOs: TERI-BCSD (Business Council for Sustainable Development), Indian Institute of Sustainable Development (IISD), World Business Council for Sustainable Development India, Institute of Bioresources and Sustainable

	Development (IBSD) and Centre for Sustainable Technology
Indonesia	<ul style="list-style-type: none"> ▪ National Indonesia Productivity Organization/Ministry of Man Power and Transmigration ▪ Ministry of Industry ▪ Ministry of Environment ▪ Ministry of Agriculture ▪ PT Martina Berto (private company) ▪ Indonesia Organic Farming Association ▪ Universities
IR Iran	<ul style="list-style-type: none"> ▪ National Iranian Productivity Organization (NIPO) ▪ Department of the Environment (DOE) ▪ National Committee of Sustainable Development (NCSD)
Laos	<ul style="list-style-type: none"> ▪ Ministry of Agriculture and Forestry (MAF) and Ministry of Industry and Commerce promote GP together ▪ MAF achieved the incorporation of GP strategy into 2010–2015 National Master Development Plan
Malaysia	<ul style="list-style-type: none"> ▪ KeTTHA Green Tech (GreenTech Malaysia) – implementation arm of Ministry of Energy, Green Technology and Water, responsible for developing and promoting green technologies ▪ Malaysia Productivity Corporation (MPC) has been leading GP promotion since 1999
Mongolia	<ul style="list-style-type: none"> ▪ Since 1998, Mongolian Productivity Organization (MPO) has been implementing GP projects with support from APO ▪ Mongolian Chamber of Commerce and Industry ▪ Ministry of Environment and Green Development ▪ Mongolian Environmental Civil Council
Nepal	<ul style="list-style-type: none"> ▪ National Productivity and Economic Development Centre (NPEDC) – NPO of Nepal ▪ Nepal-Denmark project ▪ Nepal-Finland project
Pakistan	<ul style="list-style-type: none"> ▪ National Productivity Organization (NPO) of Pakistan ▪ Small and Medium Enterprise Development Authority (SMEDA) ▪ Pakistan Institute of Trade and Development (PITAD)

	<ul style="list-style-type: none"> ▪ Energy Conservation (ENERCON)
Philippines	<ul style="list-style-type: none"> ▪ Development Academy of the Philippines ▪ National government agencies responsible for agriculture (DA), energy (DOE), environmental and natural resources (DENR), science and technologies (DOST), trade and industry (DOST) ▪ NGOs: Philippine Center for Environmental Protection and Sustainable Development, Inc. (PCEPSDI), Philippine Business for the Environment (PBE), Solid Waste Management Association of the Philippines (SWAP), Pollution Control Association of the Philippines (PCAPI)
Sri Lanka	<ul style="list-style-type: none"> ▪ National Productivity Secretariat (NPS) ▪ Nation Cleaner Production Centre (NCPC) ▪ Sri Lanka Institute of Development Administration (SLIDA) ▪ Ceylon Chamber of Commerce (CCC) ▪ Environmental Management System Users and Promoters Association (EMSUPA) ▪ Private sector industry associations/organizations
Thailand	<ul style="list-style-type: none"> ▪ Ministry of Industry: Responsible for green industry, green GDP project, Green Mark, Green Loan and green procurement projects ▪ Office of Industrial Economic: Develop master plan of increasing efficiency and productivity ▪ National Food Institute: Work on best practice for GP and carbon label improvement ▪ Electrical and Electronic Institute: Responses on EE-Green productivity integration ▪ Private sector takes part in GP implementation – clean technology, recycling business, etc.
Vietnam	<ul style="list-style-type: none"> ▪ Vietnam Productivity Center (VPC), under Directorate for Standards, Metrology and Quality (STAMEQ) since 1998. Most active between 1998–2003. Now in a policy and advocacy role ▪ Small and Medium Enterprises Development Support Center 2 (SMEDEC 2) ▪ take part in three national package projects (1st, 2nd and 9th) until 2020. Have been in charge of demonstrating GP projects in Vietnam since 2013

Findings and comments:

Based on the descriptions gleaned from the country reports, the stakeholders involved in GP implementation can be broadly grouped into three categories:

1. **Government agencies/institutions:** These government ministries or agencies can have a wide range of responsibilities, including environment, industry, economic development, science and technology, commerce and trade, energy, climate change, sustainable development, agriculture and forestry, etc. The reason for their diverse responsibilities is that GP is usually not a dedicated and independent policy area in member countries and is tied up with these policy areas. Accordingly, it is also not common to have dedicated GP promotion policies in member countries as they are often tied up with other sustainable development, environmental protection and cleaner production policies/initiatives (described later in this report). Nonetheless, these government agencies are responsible for developing and implementing policies, initiatives and projects directly or indirectly involved with GP implementation.
2. **National Productivity Organizations (NPOs)/GP Implementation Organizations:** These are organizations or entities directly involved with implementing governments' GP policies and or initiatives. As the APO member countries' respective national productivity organizations, they can be a government institution, a non-profit organization founded or supported by the government, and/or a consultancy commissioned by the government to perform the GP promotional tasks. These NPOs may decide to conduct the implementation projects by themselves or commission external consultants, experts or private organizations to perform the tasks.
3. **GP Practicing Entities:** These are the organizations/entities that actually perform the tasks of GP measures. They can be the community groups, SMEs, farmers, workers, trade/industry associations, manufacturers, or even consumer or environmental groups interested in promoting GP as part of their agenda.

Status of Implementation of GP

The results gleaned from the study on implementation of GP by member countries can be divided into two categories: general findings which are applicable to all economic sectors, and sector-specific findings related to three focused sectors (agriculture, industry and service).

General Findings

This section describes the general policies/initiatives related to GP implementation in member countries based on submitted country reports, as well as the current status of implementation and issues encountered during GP implementation.

Table 3: General Findings of GP Policies/Initiatives, Implementation Status and Issues

Member Country	Survey Result
Bangladesh	<p>Issues:</p> <ul style="list-style-type: none"> ▪ Lack of coordination among sectors ▪ Scarcity of GP experts ▪ Lack of sector guidelines for GP implementation ▪ Urgency of availability of GP information ▪ Frequent training needs on GP issues ▪ Government's role ▪ Experts' involvement ▪ Social legislation <p>Challenges:</p> <ul style="list-style-type: none"> ▪ Low level of awareness on GP ▪ Traditional mindset ▪ Resistance to change ▪ Lack of funding ▪ People's participation in implementation ▪ Need for active role of NPO
Cambodia	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Green Industry Policy: still in the initiative development stage. Draft Policy

	<p>established in 2012 and submitted to the Minister of Industry for approval for mainstreaming into the National Climate Change Policy</p> <ul style="list-style-type: none"> ▪ Cleaner Production: CP Program has been established since 2004 in Department of Industrial Techniques of the Ministry of Industry, Mines and Energy (MIME) ▪ Energy efficiency: in 2011, MIME established National Policy, Strategy and Action Plan on Energy Efficiency in collaboration with EU Energy Initiative Partnership Dialogue Facility (EUEI PDF) ▪ Industrial energy efficiency: MIME initiated projects with support from UNIDO starting in 2009 ▪ Chemical safety management ▪ Better Factories Cambodia (BFC) – ILO program initiated in 2001 ▪ Hot-Spot & TEST project ▪ 3R policies and programs ▪ Green Industry Award ▪ Green Growth Policy: 2009 National Green Growth Roadmap (NGGR), signed MOU with Global Green Growth Institute (GGGI) in 2011, 2012 National Council for Green Growth (NCGG), National Policy on Green Growth (NPGG)
Republic of China	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Pollution prevention and industrial waste minimization initiated in 1970 ▪ Key GP strategies: promote service-oriented manufacturing industry, assist SME development, promote development of key industries, foster investment, encourage foreign companies to set up Research and Development (R&D) centers ▪ Main measures: promote energy saving, disclosure of environmental information, resource recycling, cleaner production ▪ To effectively mitigate pollution and boost economic growth, ROC has initiated a wide range of measures including pollution prevention and industrial waste reduction programs, which then further extended to include cleaner production solutions in the areas of products, production processes and service <p>Status:</p>

	<ul style="list-style-type: none"> ▪ ROC promoted resource recycling technologies which aim to utilize sustainable material by constructing a resource/recycling-based society, supporting the domestic recycling industry, improving resource productivity and cyclic use rate of materials, and implementing land reclamation projects ▪ Successful experiences with the Recycling Management Fund, Four-in-One recycling system and environmental science and technology parks ▪ Significant achievements in the following areas: <ul style="list-style-type: none"> ▪ Best practices on green technologies ▪ Best practices on green energy ▪ Best practices on cleaner production ▪ Best practices on green facilities/buildings ▪ Best practices on green purchasing ▪ Best practices on ecoagriculture ▪ Best practices on resource recovery ▪ Best practices on service industries
Fiji	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ 2000: GP initiated ▪ 2002: first project taken by Fiji Sugar Cooperation, managing solid waste after production of sugar ▪ Green Productivity Demonstration Project: Pacific Batteries Limited (recycling lead) and Fletcher Pacific Steel Limited (recycling industrial oil)
India	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Industries shifted to pollution control beginning late 1980s to early 1990s, due to limited success with pollution command and control mechanisms. The government identified highly polluting industrial sectors and funded GP demonstration projects, e.g., Waste Minimization Circle (WMC) ▪ NPC has participated in APO initiated GP projects since the mid-1990s, including developing GP manuals and GP demonstration projects ▪ Other GP initiatives: establishment of national and regional Cleaner Production Centers, environmental awards, national and international fairs/workshops/seminars/conference in the field of environment ▪ Four policy missions with a bearing on GP were launched between 2009–

	<p>2010: National Mission for a Green India, National Mission on Enhanced Energy Efficiency, Jawaharlal Nehru National Solar Mission (JNNSM) and National Water Mission</p> <ul style="list-style-type: none"> ▪ The Department of Industrial Policy and Promotion (DIPP) and the Ministry of Commerce and Industry introduced a new national manufacturing policy emphasizing SMEs and focusing on environmental auditing, green manufacturing, water conservation, wastewater treatment, renewable energy, green buildings, etc. ▪ Issues: <ul style="list-style-type: none"> ▪ No productivity policy, therefore no GP policy. However the new manufacturing policy has covered issues relevant to the promotion of GP ▪ Proposed measures for water conservation, water auditing etc. will result in a huge demand for certified environmental auditors and water auditors. Therefore, guidelines need to be developed to provide to certified auditors ▪ There will be huge capacity building issues in India around environmental and water auditors ▪ All India Council for Technical Education (AICTE) accredits engineering and management colleges in India and has made passing the environmental education paper mandatory for all students, although contents are generic and basic in nature ▪ GP concept may be incorporated in the syllabus and other streams of education may also be brought in to create awareness about GP ▪ No benchmarks exist in the area of energy consumption, water consumption, raw material consumption etc. Despite launching a lot of initiatives which have a bearing on GP, no sectoral benchmarks have been set.
Indonesia	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ The System of Rice Intensification (SRI) has had limited implementation in Java Island since 1975, and has been given particular consideration for wide implementation from 1999 onward ▪ Issues on productivity and environmental protection have been given attention and implemented since early 1990 ▪ Cleaner production has been discussed and was selectively implemented in

	<p>1994</p> <ul style="list-style-type: none"> ▪ A national program on green industry was initiated around 2005 ▪ A special task force, namely the Center for Green Industry and Environmental Assessment Agency for Industrial Policy, Climate and Quality Assessment, was established in 2009 (attached to the Ministry of Energy and Mineral Resource) ▪ Self-sufficiency in electricity energy (micro-hydro and solar-based energy) as part of a national development program on Desa Mandiri Energi (energy sufficiency at village level) was started in 2010
IR Iran	<p>GP Policies/Initiatives (With APO Assistance):</p> <ul style="list-style-type: none"> ▪ GP workshops implemented for Iranian Industrial Development Organization, Tehran Recycling Organization, Sarcheshmeh Copper Complex, etc. ▪ GP demonstration programs implemented for a car manufacturing company (paint shop), Sugar Cane & Byproducts Development Corporation, Alcohol Factory, etc. <p>National promotion activities:</p> <ul style="list-style-type: none"> ▪ Green Award ▪ Green Government ▪ Eco-Product Exhibition <p>Implementation Status:</p> <ul style="list-style-type: none"> ▪ GP activities were initiated in 1999 ▪ GP not practiced by majority of public/private entities ▪ Gap exists between NIPO's present and required capability ▪ NIPO is well recognized, yet services and coverage are limited ▪ Training courses are limited and their content is not up to date ▪ The government's 5th national development plan (2009–2014) provided a good opportunity to use GP <p>Issues for GP practices in food industry:</p> <ul style="list-style-type: none"> ▪ Not using state-of-the-art technology in the packaging process ▪ Insufficient attention to market research ▪ Lack of modern technology in production process ▪ Not using proper production capacity

	<ul style="list-style-type: none"> ▪ Absence of optimum R&D activities in food SMEs
Laos	<p>GP Policies/Initiatives:</p> <ul style="list-style-type: none"> ▪ 2005 environmental policies contain recommendations to promote organic farming and certify/accredit environmental laboratories, to build the capacity of technology transfers and research the effects of subsidies ▪ Climate change policy related to green energy, energy efficiency, vehicle fuel efficiency, urban planning, and cleaner production <p>Issues:</p> <ul style="list-style-type: none"> ▪ Producers' attitudes to GP are negative due to the issue of high investment and low return ▪ Quite difficult to express GP's benefit and value for their businesses ▪ No desire to implement GP if no customer demand exists ▪ Business groups need support from the government on investment, promotion, and on production techniques and market issues ▪ Collaboration and networks ▪ Planning and budget ▪ Attitude and awareness ▪ Monitoring and evaluation
Malaysia	<p>Policies/Initiatives:</p> <ul style="list-style-type: none"> ▪ 2009: National Green Technology Policy laid out the route of GP for Malaysia ▪ 2010: MPC implemented Material Flow Cost Accounting (MFCA) in five model companies ▪ 2012: MPC initiated MFCA Task Force ▪ 2013: MFCA rebranded into Material Cost Saving (MCS) <p>Status:</p> <ul style="list-style-type: none"> ▪ Most common reported GP-related activities: ISO 14001, reuse, recycle, energy efficient program and Kaizen activities ▪ Acceptance and willingness to implement GP by the industries remains questionable <p>Issues:</p> <ul style="list-style-type: none"> ▪ The survey indicated moderate GP awareness but relatively low GP implementation

	<ul style="list-style-type: none"> Technology and financial assistance were reported as the main challenges, as well as the most needed resources for GP implementation
Mongolia	<p>Policies/Initiatives:</p> <ul style="list-style-type: none"> First stage (1998–2002): focused on awareness training, introduced training programs on productivity improvements with APO’s experts Second stage (2000–2010): focused on rural areas with education sectors Third stage (2011 onwards): green economic development <p>Implementation Status:</p> <ul style="list-style-type: none"> Some industries implemented GP programs (e.g., GP and wastewater treatment) GP in cashmere industries, solid waste management etc. <p>Issues:</p> <ul style="list-style-type: none"> Poor GP awareness Financial crisis slows GP adoption Lack of institutional GP framework Weak information system Lack of national experts Lack of environmental regulations
Nepal	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> First GP program launched in 1996 by NPEDC NPEDC conducted GP study of KMSS in 2010 <p>Issues:</p> <ul style="list-style-type: none"> Low level of GP awareness Traditional mindset/resistance to change Poor business practices and lack of professionalism in the enterprises Fear of taking risks and increasing production costs Weak enforcement of existing environmental rules and regulations Absence of environment policy at plant level Low level of consumer and public pressure Management, support and technology factors
Pakistan	<p>Issues:</p> <ul style="list-style-type: none"> Most GP activities were carried out for energy efficiency, audits and conservation for industry and buildings. Lack of energy audits for other

	<p>sectors (e.g., agriculture and SMEs)</p> <ul style="list-style-type: none"> ▪ GP implementation carried out under different names, e.g., green growth, clean production, green economy, climate change adaptations, ecosystem restorations, waste minimization ▪ GP activities scattered, poorly reported/documented, without any coordinated mechanisms ▪ Lack of realistic policies/strategies to support energy efficiency, audits and R&D in the renewable energy sector ▪ Lack of top-down approaches (e.g., policies, laws, regulations, training, etc.,) and bottom-up approaches (responding to the needs of stakeholders such as industry, services, farmers and households) for GP
Philippines	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Sustainable development-related GP initiatives since 1992 ▪ APO-induced GP promotion initiated in 1996 by the Development Academy of the Philippines (DAP) following the first APO GP conference ▪ DAP promoted GP-related projects including: GP advocacy/promotion projects (e.g., first and second APO World Conferences on GP); GP demonstration projects (e.g., farming, food production); GP dissemination assistance (e.g., hog, fish farm); and capacity building projects (e.g., EMS, ecotourism workshops)
Sri Lanka	<p>Issues:</p> <ul style="list-style-type: none"> ▪ State policy ▪ Lack of publicity, general/sectoral awareness, general/market acceptance ▪ Lack of recognition ▪ Lack of application, corporate acceptance ▪ No motivation ▪ Ignorance of benefits and state policy ▪ GP networking is absent among local stakeholders, and except for one instance where NPS was involved with Mongolia, international networking is absent ▪ Promotion of GP adoption should be through state policy. The Chambers of Commerce and Industry can use GP as a market instrument to provide an advantage to the consumer. This can be achieved through sensitizing the

	<p>chambers.</p> <ul style="list-style-type: none"> Documentation of good practice is not sufficient, although there are many good practices
Thailand	<p>GP Policies/Initiatives:</p> <ul style="list-style-type: none"> 2010: GP promoted to help improve SME capability and sustainability 2011–2012: GP promoted to combat energy crisis and carbon pollution GP strategy incorporated into the 2013–2031 National Development Master Plan <p>Implementation Status:</p> <ul style="list-style-type: none"> Between 2008–2012, the government invested GP 60 Million Baht (USD1.7 million) to promote implementation of GP in 345 factories. The total saving was THB597.89 million, from EE green productivity projects, best practices on GP, continuous improvement projects and Carbon Label project <p>Issues:</p> <ul style="list-style-type: none"> Attitude and awareness: many companies are not aware of the impact of inadequate energy or pollution dispersion Collaboration and networks: GP implementation needs collaboration among businesses to make it happen Planning and budgeting: budget is the key issue regarding the implementation of GP because it impacts cost and growth of businesses Monitoring and evaluation: currently, GP implementation needs an organization to monitor and evaluate the progress of each project <p>General</p> <ul style="list-style-type: none"> Most do not understand the GP concept or implementation due to lack of training Organizations do not see the benefit of GP or how GP could support their processes Many understand the individual parts of GP but not how to link these parts together to be of benefit People have not been trained or consulted about GP in an effective way, especially regarding how to apply an integrated approach and available GP tools to help achieve a realistic result Most companies (especially manufacturers) focused on the activities of

	<p>reusing and recycling products and materials in their process, improving the process of preventing environmental impact, using environmentally friendly material and improving their workplace environment. Less supported activities include: pollution reduction, community waste reduction, supplier evaluation and the recycling process.</p> <p>Organizational</p> <ul style="list-style-type: none"> ▪ Do not consider GP important ▪ Emphasis on environmental issues, not implementing GP ▪ No training program on concept and implementation methods of GP ▪ High turnover rate causes discontinuity in GP implementation ▪ Consider GP costs too high ▪ OEMs fear GP implementation may impact customer requirements ▪ High cost of using green material may reduce competitive advantage ▪ Not enough investment in developing substitute materials ▪ Cannot see the value of GP-related standards, e.g., OHSAS 18001:2007, ISO 14001:2004 standard, Agriculture Standards Act, B.E. 2008, Green Label (ECO-Label) etc. ▪ Lack an integrating team to improve and contribute to GP project <p>Leadership</p> <ul style="list-style-type: none"> ▪ Management are not aware of the impact of energy or pollution ▪ Management emphasizes short-term cost reduction <p>People</p> <ul style="list-style-type: none"> ▪ People not trained in GP concept and implementation ▪ People have no opportunities to share ideas or provide recommendations to improve processes or workplace environments
Vietnam	<p>GP Policies/Initiatives:</p> <ul style="list-style-type: none"> ▪ Low labor productivity (61% of ASEAN average, 22% of Malaysia, 12% of Singapore) ▪ 1995: first Vietnam Quality Conference held, launched Quality Decade 1996–2005 ▪ 2010: approved first national productivity program, Enhancing Productivity and Product Quality of Vietnam until 2020, and launched nine package projects <p>Promotion programs:</p> <ul style="list-style-type: none"> ▪ GP awareness training

	<ul style="list-style-type: none"> ▪ For village programs: using banners, slogans, posters, local radio, television and notice boards ▪ Site visits to villages ▪ Community GP competitions ▪ TV broadcasts and programs ▪ GP conferences and seminars ▪ GP expert network <p>Implementation Status:</p> <ul style="list-style-type: none"> ▪ Since 1998, the Vietnam Productivity Center (VPC), under STAMEQ, has successfully implemented GP projects with APO in community groups throughout Vietnam (different from other APO MCs) ▪ 1998: the first community projects were implemented under APO: Green Productivity Project (GPDP) ▪ 1998–2003: community projects focusing on solid waste, clean water and human and animal waste (GP introduced into 81 villages in 21 different provinces) ▪ For industry, GP programs were successfully implemented in two large cement companies: Vicem Hoang Thach Cement Company Limited and Saigon Development Corporation ▪ 1998–2003: GP greatly contributed to rural development ▪ Vietnam was the first country to apply GP at community level ▪ GP can enhance sustainable development ▪ VPC brought GP success and international recognition to Vietnam <p>Since 2013, SMEDEC2 has provided GP leadership and implemented four projects under the second package:</p> <ul style="list-style-type: none"> ▪ Organizing a GP awareness program ▪ Establishing GP training materials and conducting training courses ▪ Broadening the demonstration projects on management systems (ISO 9000, ISO 22000) and other productivity (5S, 7 tools) application to 100 enterprises ▪ Implementing a demonstration project on Material Flow Cost Accounting (MFCA to SMEs)
--	--

	<p>Issues:</p> <ul style="list-style-type: none"> ▪ GP awareness hampered by financial crisis ▪ Poor enforcement of environmental regulations ▪ Low labor cost ▪ GP program's dependence on external funding ▪ Weak internal information system ▪ Delivery of GP knowledge to students ▪ A lack of professional and practical GP consultants/experts ▪ Need to develop sectoral GP guidelines ▪ Need to strengthen GP network/information availability ▪ GP training needs to target top management
--	--

Findings and Comments

The following findings from the member countries' reports can be generalized:

1. **Few countries have dedicated GP policies or strategies:** most APO member countries are already promoting resource recycling, energy efficiency, waste reduction, ecoagricultural practices and relevant management measures which are important components of GP. However they are often pursued under a different theme or title, such as environmental pollution, sustainable development, climate change, green technologies and organic farming, etc. This sometimes causes low GP awareness within businesses.
2. **The status of GP implementation varies widely among member countries,** as does the perception or awareness of GP, but most member countries benefit from an enhanced promotional campaign on GP awareness.
3. **The reasons for poor GP implementation also varies among member countries** but typical issues are lack of knowledge, experts, funding, awareness, legislative environment and institutions assistance, etc.
4. **The lack of external assistance on funding and expertise** is also one of the major reasons for some member countries with low GP implementation. Owners of manufacturing plants are afraid of taking risks and increased production costs associated with GP.

Sector-Specific Findings

Agriculture

Table 4 Sector-specific (Agriculture) Findings of GP Policies/Initiatives, Implementation Status and Issues

Member Country	Survey Result
Bangladesh	Not indicated
Cambodia	Not indicated
Republic of China	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ The Agriculture Production and Certification Act has attracted more farmers to invest in the organic agriculture business since 2007. By October 2013, the verified organic farming area had reached 5,864 Ha with a 148% increase compared to 2,356 Ha at the end of 2008 ▪ The Exquisite Agriculture Health-Excellence Program offers three major advantages: (1) enhances the safety validation and creates a toxic-free healthy island, (2) leads the technology R&D and creates an island of superior agriculture science, (3) reshapes the rural culture and creates a smart-living island. This program has achieved the enhancement of organic certification agencies and the strengthening of the certification management of organic agricultural products
Fiji	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Nothing formal happening, but some domestic and commercial farmers are using natural manures to supplement fertilizers. Some constructed compost facilities ▪ Farmers are being encouraged to use compost to eventually replace chemical fertilizers
India	Not indicated
Indonesia	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Organic farming (as part of ecoagriculture): system of Rice Intensification (SRI) practiced mostly on Java island (Districts of Tasikmalaya, Garut, Bandung, Sukabumi, Cianjur, Palembang, and some rice production areas on outer islands)

	<ul style="list-style-type: none"> ▪ Eco-labelling for forestry products (mainly timber products on Kalimantan island and East and Central Java islands) ▪ Waste of palm oil and animal waste (cow) are turned into biogas for local electricity
IR Iran	Not indicated
Laos	Not indicated
Malaysia	<p>GP Policies/Initiatives/Status:</p> <p>Only one respondent from the agriculture sector who claims no GP-related activities at this stage</p>
Mongolia	Not indicated
Nepal	<p>GP Policies/Initiatives/Status:</p> <p>In recent years, the government has improved the productivity of the agriculture sector by coordinating with different village communities in the rural areas, focusing on:</p> <ul style="list-style-type: none"> ▪ improving farmers' productivity ▪ linking farmers to domestic as well as international markets ▪ capturing value-added opportunities ▪ managing the natural base ▪ strengthening public expenditure performance
Pakistan	Not indicated
Philippines	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Solid waste management (e.g., recycling, composting) ▪ Water resources management ▪ Water quality management and assessment ▪ National Greening Program/tree planting/reforestation ▪ Food safety management (GAP, HACCP) ▪ Organic agriculture/natural farming 5S in the communities (Tapat Mo, Linis Mo) ▪ Highland vegetable production through good agricultural practices ▪ Good animal husbandry practices ▪ Effective cooperative practices ▪ Farm infra support program <p>Achieved Benefits/Results: reduced cost and increased market access,</p>

	<p>minimized pesticide use, new technologies adapted, agri-wastes recycled into value-added products, availability of safe potable and irrigation water and improvement in productivity.</p> <p>Issues:</p> <ul style="list-style-type: none"> ▪ Lack of awareness and understanding of GP by managers and workers ▪ Attitude problem (no commitment/resistance to change) ▪ Inadequate training and education ▪ Financial constraints ▪ High transport cost (production and marketing) ▪ Inadequate government support (infrastructure, funding) ▪ Weak links among private, academic and government sectors in promoting GP ▪ Lack of information on GP best practices and green technologies ▪ No monitoring/evaluation of GP initiatives
Sri Lanka	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ GP is not well practiced in the agricultural sector, as seen from stakeholder consultations with the farmers' societies
Thailand	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ As a result of the survey, two companies implement ISO 14001:2004, OHSAS 18001:2007 and ISO 9001:2008 ▪ Lack of communication and promotion on GP awareness, especially on environmental concerns ▪ Promote many programs of producing organic product, using natural materials and alternative energy (biogas) ▪ Implement carbon footprint label and evaluation standard ▪ Implement Agriculture Standards Act, B.E. 2008 to control quality and safety of agriculture products (including operation process)
Vietnam	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Plenty of experiences on community level GP projects, mostly agriculture-related

Findings and comments: Besides ROC's sophisticated Agriculture Production and Certification Act and Exquisite Agriculture Health-Excellence Program, there are few examples of GP practices in the agriculture sector, as many country reports do not cite sector-specific examples. However, from the available information, it can be seen that organic farming (including the use of organic compost and natural materials) and certification, biogas utilization, system of rice intensification, quality/environmental management system and eco-label and carbon label, etc., have been practiced. Agriculture is also a sector where community GP projects (especially in Vietnam) have been demonstrated successfully.

Industry

Table 5: Sector-Specific (Industry) Findings of GP Policies/Initiatives, Implementation Status and Issues

Member Country	Survey Result
Bangladesh	Not indicated
Cambodia	Issues: <ul style="list-style-type: none"> ▪ Limited awareness of GP among government officials and the private sector ▪ Lack of local talent for implementation of GP, such as GP trainers, consultants or practitioner certification. ▪ Insufficient government policies for the introduction of GP practices ▪ Lack of GP model companies for better dissemination of GP performance ▪ Insufficient research facilities and centers to support innovative research and assistance to the private sector
Republic of China	GP Policies/Initiatives/Status: <ul style="list-style-type: none"> ▪ Best practices on green energy ▪ Best practices on cleaner production ▪ Best practices on green facilities/buildings ▪ Best practices on green purchasing ▪ Best practices on resource recovery
Fiji	GP Policies/Initiatives/Status: <ul style="list-style-type: none"> ▪ Waste management, recycling, waste minimization, renewable energy (solar), ecotourism, IT virtualization, and cloud computing ▪ Conduct large-scale recycling of scrap metals

India	<p>Summarized from the general findings (Table 3).</p> <p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ The government identified highly polluting industrial sectors and funded GP demonstration projects ▪ NPC participated in APO-initiated GP projects , including developing GP manual and demonstration projects ▪ Other GP initiatives: cleaner production centers, environmental awards, fairs/ workshops/seminars /conferences in the field of environment. ▪ 2009-2010: National Mission for a Green India, National Mission for Enhanced Energy Efficiency, Jawaharlal Nehru National Solar Mission (JNNSM) and National Water Mission ▪ New National Manufacturing Policy emphasizing SMEs and focusing on environmental auditing, green manufacturing, water conservation, wastewater treatment, renewable energy, green buildings, etc. <p>Issues:</p> <ul style="list-style-type: none"> ▪ The new manufacturing policy has covered issues relevant to the promotion of GP. ▪ Huge demand for certified environmental auditors and water auditors ▪ Huge capacity building issues in the area of environmental auditors and water auditors ▪ All India Council for Technical Education (AICTE) accredits engineering and management colleges. Students have to take mandatory environmental education. GP concept incorporated into the syllabus and other streams of education ▪ No sectoral benchmarks in the area of energy consumption, water consumption, raw material consumption etc.
Indonesia	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Industrial waste management, locally known as IPAL (liquid waste management installation). Any industry producing wastewater (exceeding threshold point) must be equipped with the IPAL ▪ Provided industrial companies with practical ways to implement energy conservation and CO2 emission reduction ▪ Formulated an incentive system for industries implementing GP

	<ul style="list-style-type: none"> ▪ Conducted practical training on the implementation of GP programs ▪ Published a practical guidance book on GP ▪ Conducted special training (training for the trainers) on GP based on the results of research and development activities
IR Iran	Not indicated
Laos	Not indicated
Malaysia	<ul style="list-style-type: none"> ▪ Implemented in various stages, included focus on reducing pollution to most cost or material efficient
Mongolia	<ul style="list-style-type: none"> ▪ Some industries implemented GP programs with different approaches, such as GP and wastewater treatment, GP in cashmere industries and solid waste management etc.
Nepal	<ul style="list-style-type: none"> ▪ GP concepts still new to many industries in Nepal ▪ 2000: National Productivity and Economic Development Centre promoted GP with APO to the following industries: soap and detergent, paper mills, dairy, noodles and leather <p>Issues:</p> <ul style="list-style-type: none"> ▪ Lack of awareness about environmental hazards ▪ Archaic business practices ▪ Resistance to change ▪ Lack of proper incentives and facilities for pollution prevention ▪ Inadequate policies and legal support ▪ Poor monitoring and enforcement of existing rules and regulations ▪ Most Nepalese Industries have not been able to implement GP in their work areas
Pakistan	Not indicated.
Philippines	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Solid waste management/waste reduction/waste segregation ▪ Materials recycling ▪ Reduce, Reuse, Recycle (3Rs) ▪ Installation of wastewater treatment facility/recycling ▪ Water quality management. ▪ Energy management/renewable energy use ▪ Use of non-toxic chemicals

	<ul style="list-style-type: none"> ▪ Food Safety Management Program (HACCP, ISO 22000) ▪ Use of natural items in products (organic materials) ▪ Geo-hygenics concept promotion ▪ 5S/Good Housekeeping ▪ Ecotourism promotion ▪ Good Manufacturing Practices (GMP) program ▪ ISO 14001 EMS <p>Achieved Benefits/Results: lower cost/increased revenue, access to financial aid, disaster mitigation, food safety and security, water conserved, local resources/products patronized, cost-saving innovation adapted, improved occupational health and safety conditions, less accidents, improved morale and overall efficiency and company productivity.</p> <p>Issues:</p> <ul style="list-style-type: none"> ▪ Low level of awareness on GP by company decision-makers and employees ▪ Negative attitude of workers ▪ Financial constraints ▪ Lack of access to funding investment/support (e.g., for projects and green technology acquisition) ▪ Lack of government support (e.g., infrastructure, tax incentives) ▪ Weak sustainability mechanism ▪ Lack of information on GP best practices ▪ No focal organization for GP program ▪ Overall, industry sector still has low level of awareness on GP and limited application of GP tools and techniques
Sri Lanka	<p>Issues:</p> <ul style="list-style-type: none"> ▪ Lack of top management acceptance/support ▪ Lack of capacity for training ▪ Lack of knowledge of benefits/benefits not visible
Thailand	<ul style="list-style-type: none"> ▪ 20 companies from the survey have implemented ISO 14001:2004, OHSAS 18001:2007; 30 companies have implemented ISO 9001:2008 ▪ Promote programs of energy saving, 3Rs process improvement, waste and garbage reduction, clean technology implementation and alternative energy (i.e. wind energy, solar energy, etc.)

	<ul style="list-style-type: none"> ▪ Implement green label (eco-label), carbon footprint and organic food label ▪ Apply GP tools (i.e. eco mapping, LEAN, TPM) to improve productivity and prevent environmental degradation ▪ Promote green industry by using GP road maps
Vietnam	<ul style="list-style-type: none"> ▪ Little experience in industrial GP applications / using natural materials and equipment

Findings and comments: The practicing of GP in member countries depends highly on the reliance of each member country on specific sectors. In member countries where the industry sector is better developed, many GP measures are already widely practiced, including energy efficiency, resource and reuse recycling, waste management, waste minimization, cleaner production, green energy, eco-labeling, carbon footprint label, environmental management system and GP financial incentives, etc. There are already many GP tools (i.e., eco mapping, LEAN and TPM, etc.) available to the industry sector.

Service

Table 6: Sector-specific (Service) Findings of GP Policies/Initiatives, Implementation Status and Issues

Member Country	Survey Result
Bangladesh	Not indicated
Cambodia	Not indicated
Republic of China	GP Policies/Initiatives: <ul style="list-style-type: none"> ▪ Best practices on green purchasing ▪ Best practices on service industries
Fiji	GP Policies/Initiatives: <ul style="list-style-type: none"> ▪ Ecotourism, waste management, renewable energy (solar, hydro), IT virtualization, cloud computing.
India	Not indicated
Indonesia	GP Policies/Initiatives: <ul style="list-style-type: none"> ▪ Eco-living estate ▪ Eco-village (ecotourism) ▪ Eco-settlement/housing complex

	<ul style="list-style-type: none"> ▪ Renewable alternative energy (solar, biogas, micro-hydro) ▪ Eco-efficiency in industrial, agriculture and office sectors ▪ Eco-labelling (forestry and agriculture products)
IR Iran	Not indicated
Laos	Not indicated
Malaysia	No response from services sector
Mongolia	Not indicated
Nepal	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Developers resorted to developing tourist attractions in and around natural scenic sites, including ecologically sensitive areas, sometimes resulting in severe environmental degradation ▪ Need to balance the needs of tourism development with environmental constraints to ensure both economic and ecological sustainability ▪ GP signifies a new paradigm of socioeconomic development aimed at pursuing economic and productivity growth while protecting the environment ▪ Application of the concept and practices of GP is deemed to be a very appropriate strategy in the context of ecotourism for socioeconomic development
Pakistan	Not indicated
Philippines	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Solid Waste Management Program (waste segregation, recycling) ▪ Infectious/hazardous waste management program ▪ Septic Tank Management Program ▪ Reduce, Reuse, Recycle (3Rs) ▪ Wastewater Minimization Program ▪ Watershed Management Program ▪ Water Conservation Program ▪ Rain Water Harvesting/Recycling Sustainable Storm Water Management Program ▪ Natural Wastewater Treatment System ▪ Leak Detection Program ▪ Oil and Grease Management Program

	<ul style="list-style-type: none"> ▪ Tree Planting (National Greening Program) ▪ Energy Efficiency Program ▪ Efficient Lighting Retrofit Program ▪ Efficient Appliances Utilization Program ▪ Maximum Demand Load Management ▪ Boiler Efficiency Program ▪ Transport Efficiency Program ▪ Renewable Energy Sources Harnessing Program ▪ Cool Roof Program ▪ Use of natural/organic raw materials ▪ 5S Program ▪ Material Flow Cost Accounting (MFCA) ▪ Lean Management System <p>Achieved Benefits/Results: enhanced awareness of GP, cost savings, increased profits, improved quality of services, increase in tourism, rejuvenation of nature, preservation of natural capital, higher employment rates, cleaner air, improved health and safety conditions and reduction of solid wastes.</p> <p>Issues:</p> <ul style="list-style-type: none"> ▪ Resistance to change by management ▪ Lack of managerial support ▪ Negative attitudes of workers ▪ Apprehension of companies to share emission information ▪ GP activities perceived as costly ▪ Inadequate funding resources ▪ Low public awareness and appreciation of GP ▪ Limited access to investment funding support ▪ Inadequate information about GP ▪ Lack of qualified staff to implement GP ▪ Inadequate knowledge and skills on GP tools and techniques ▪ Weak monitoring and evaluation mechanism ▪ Lack of market demand for green products ▪ Lack of designated GP-focused organization
--	--

	<ul style="list-style-type: none"> ▪ Extent of GP adaption and application by stakeholders in the sector is still in the initial stage with limited application of GP tools, techniques and technologies at enterprise level
Sri Lanka	<ul style="list-style-type: none"> ▪ Lack of resources for training of large staff ▪ Lack of capacity for training ▪ Lack of/insufficient appreciation at corporate level
Thailand	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Eight companies that took part in the survey have implemented ISO 14001:2004, OHSAS 18001:2007 and ISO 9001:2008. ▪ Promotion of many programs about ecotourism, eco-resort, eco-hotels, including alternative energy, recycling and reusing implementation ▪ Lack of GP knowledge and understanding of GP ▪ New support services available on using natural materials and equipment
Vietnam	<p>GP Policies/Initiatives/Status:</p> <p>Little experience in service sector of GP applications.</p>

Findings and comments: The member countries have reported few GP practices for the service sector. Of the few GP examples cited are ecotourism/hotels, eco-housing, energy efficiency, eco-labeling, green purchasing, quality/environmental management systems, green IT technologies (cloud computing, IT virtualization) and green energies. There are already existing GP practices and practical experiences available to the service sector.

Results on Assessment of Needs of Member Countries

This section presents the results from the study on assessment of needs for GP by member countries. Again, the results can be divided into two categories: general findings which are applicable to all economic sectors; and sector-specific findings relating to three focused sectors: agriculture, industry and service.

General Findings

Table 7: General (non sector-specific) Findings of GP Needs of Member Countries

Member Country	Survey Result
Bangladesh	Not indicated
Cambodia	Not indicated
Republic of China	<ul style="list-style-type: none"> ▪ To elevate Taiwan's international standing in trade so that it can become the global innovation center, Asia-Pacific operation hub, and operation headquarter for local businesses ▪ To transform ROC into a more diverse industrial structure, meet the international responsibility of environmental protection and energy conservation, as well as upgrade the industrial value-added ▪ To facilitate balanced regional developments, assist small and medium enterprises, and create diverse job opportunities to realize the goal of a happy ROC
Fiji	Not indicated
India	<ul style="list-style-type: none"> ▪ Procedures for GP implementation schemes to be simplified, and the financial/technical assistance to be provided ▪ Useful information from every department, organizations etc. should be uploaded onto accessible websites ▪ Every year a national-level workshop to be organized by all ministries/departments running any GP incentive schemes ▪ Guidelines need to be developed to certify environmental auditors and water auditors ▪ GP concept may be incorporated in college syllabuses and other streams of education may also be brought in to create awareness about GP. ▪ Develop GP benchmarks in the area of energy consumption, water consumption, raw material consumption, etc.
Indonesia	<p>GP promotion and implementation through:</p> <ul style="list-style-type: none"> ▪ Training on GP concept and practices for various GP implementation schemes ▪ Awards and/or certificates for GP implementation, especially in industrial

	<p>activities such as cleaner production</p> <ul style="list-style-type: none"> ▪ Incentives for GP implementation, especially in industrial activities through, for example, income tax policy, reduced import tax for environmentally sound machinery or other needed technology ▪ University research on GP
IR Iran	<p>Need to strengthen GP practices through:</p> <ul style="list-style-type: none"> ▪ Speed up the GP movement through research and consulting services, promotional and awareness creation on a much larger scale ▪ Improving linkage among different sectors through promoting GP concepts and practices and application of ICT in all economic sectors. <p>Needs for NIPO to implement GP program:</p> <ul style="list-style-type: none"> ▪ Review existing services and develop training manuals ▪ Introduce more qualified staff ▪ Enhance staff training programs ▪ Need to strengthen national GP strategies ▪ _ Need to improve staff training ▪ Need to strengthen national GP networks ▪ Needs for the GP approach to establish competitive SME for economic development
Laos	Not indicated
Malaysia	<ul style="list-style-type: none"> ▪ Need to organize and promote Green Growth System ▪ Most SMEs suggested an increase in GP awareness seminars ▪ Ministry of Energy, Green Technology and Water suggested enhanced GP promotion among industry and government agencies. <p>Suggestions from the GP survey questionnaire and interview suggested:</p> <ul style="list-style-type: none"> ▪ Establish GP network: target GP organization interactions; introduce active center to promote GP activities among industries ▪ Use of Material Flow Cost Accounting to link GP initiatives with cost factor ▪ Establish GP showcase model companies ▪ Enhance GP education for industries and higher education institutions ▪ Enhance GP competence among workforce, practitioners, certified consultants and trainers ▪ Introduce GP-related certifications, such as cleaner production certification

	<ul style="list-style-type: none"> ▪ Implement GP awareness project, targeting management of organizations ▪ Establish GP support team ▪ Seek government or international organizations' financial assistance ▪ Organize GP industry award
Mongolia	Not indicated
Nepal	Not indicated
Pakistan	<ul style="list-style-type: none"> ▪ Need to develop sectoral knowledge base and implementation procedures for GP framework and demonstration projects ▪ Need to analyze and provide support for 'life cycle assessment', labor productivity, eco-design, eco-product, reduction of waste through equipment efficiency, recycling and eco-purchase
Philippines	<ul style="list-style-type: none"> ▪ Need more responsive GP programs to support the adoption of Green Economy Strategy following the Rio +20 Summit commitments of the country ▪ Need stakeholders from the government, private business sector and NGOs to collaborate in promoting, implementing and sustaining GP initiatives in agriculture, industry (SMEs) and services sectors as well as in the public sector ▪ Focal organizations for GP programs in government, private businesses and NGOs need to be designated/managed ▪ Awareness Raising and Advocacy Program on GP needs to be revived, targeting policymakers/decision-makers, workers and other stakeholders, utilizing tri-media, overseas study missions and pilot projects, among others ▪ Need capability building (training and education) on GP policy/strategy development, program design and management, and basic and advanced GP tools, techniques and technologies ▪ Funding and investment support for GP programs should be facilitated by the government as well as private business sector and donor agencies (including government budget allocations, tax incentives and donor funding) ▪ Need better access to information on best practices in GP strategy development, program design, outcome measurement and green

	<p>technologies and technical expertise</p> <ul style="list-style-type: none"> ▪ Networking and building strategic partnerships with local and international organizations should be pursued and strengthened ▪ Need to set up a pool of technical experts, consultants and advisors which could be accessed by GP stakeholders ▪ Monitoring and evaluation of GP program should be institutionalized to help provide vital information for top management/decision-makers and program implementers
Sri Lanka	<ul style="list-style-type: none"> ▪ More training courses, workshops and seminars should be conducted for the state as well as the private sector to : <ol style="list-style-type: none"> 1. sensitize top management 2. increase awareness among producers, providers and consumers 3. promote GP as an intelligent choice for the consumer through marketing 4. convince state to formulate policies 5. promote GP as an easy measure to achieve sustainability
Thailand	<ul style="list-style-type: none"> ▪ Most companies proposed that any investment in GP improvement projects should benefit from tax reduction. ▪ Organizations have faced the issue of the turn-over rate. ▪ Cost of using the organic material or environmental friendly material is quite expensive. ▪ Organizations lack integrated team to improve and contribute to GP projects.
Vietnam	<ul style="list-style-type: none"> ▪ Cooperate with APO or other funds to launch specific Vietnamese GP website to stay up to date with GP implementation and strategy ▪ Establish GP networks to link all GP training, consulting and promotion efforts in Vietnam ▪ Cooperate with APO and other organizations to establish GP guidelines of important industries/sectors in Vietnam (e.g., seafood processing, handcraft, foodstuff, dairy products, chemicals); and publish these guidelines on the APO website and at the Vietnamese GP center ▪ VPC/SMEDEC 2 to cooperate with APO to organize the national training of trainers and consultants on GP in Vietnam

	<ul style="list-style-type: none"> ▪ Develop a training kit for the development of GP programs ▪ Cooperate with other funds to develop training programs that train general management and accounting systems prior to the introduction of GP concepts ▪ Deliver GP content to university students ▪ Suggest the national long-term GP training courses with practical elements, with support from APO and other international organizations
--	--

Findings and Comments

Participating member countries' general GP needs can be summarized as follows:

1. **Economic restructuring:** elevate international standing in trade to become the global innovation center, Asia-Pacific operation hub, and operation headquarter for local businesses; develop a more diverse industrial structure, meet the international responsibilities of environmental protection and energy conservation, and upgrade the industrial value-added; facilitate balanced regional developments, assist small and medium enterprises, and create diverse job opportunities (ROC).
2. **Capacity building:** improve consultants' capacity, develop training manuals (Iran); GP knowledge base and implantation procedures for demonstration projects, support new technology (LCA, eco-design, recycling, green purchasing) (Pakistan); establish GP guidelines and training kits, suggest long-term GP training courses (Vietnam); conduct university research (Indonesia); promote GP education, certification and management awareness projects (Malaysia); establish GP integration teams for companies (Thailand); undertake institutionalized monitoring and evaluation of GP program, establish pool of GP experts, strengthen networking, improve access to GP information (Philippines); develop guidelines for certification of auditors, establish a GP benchmark for industries (India).
3. **Improve awareness:** hold GP seminars for SMEs, industries and government, GP awards (Malaysia); deliver GP concepts to university students (Vietnam); utilize media coverage, pilot projects and overseas study missions (Philippines); annual GP workshops, information posted on websites (India).
4. **Establish GP network** (Malaysia, Iran, Vietnam and the Philippines)
5. **Financial incentive:** seek financial assistance for GP implementation (Malaysia); provide financial incentives (Indonesia); provide tax benefit for companies implementing GP

projects (Thailand); facilitate GP investment (Philippines); financial assistance for GP scheme (India).

Sector-Specific Findings

Agriculture

Table 8: Sector-specific (Agriculture) Findings of GP Needs of Member Countries

Member Country	Survey Result
Bangladesh	Not indicated
Cambodia	Not indicated
Republic of China	Not indicated
Fiji	<ul style="list-style-type: none"> ▪ Usage of natural manures in composting ▪ Need to replace traditional farming practices (use of chemical fertilizers) with agro-ecological methods
India	Not indicated
Indonesia	<ul style="list-style-type: none"> ▪ Policy/regulations to speed up the use of organic-based fertilizer and other agricultural inputs ▪ Incentive and disincentive measures for organic farming ▪ Enhancing capacity for farmers and government staff on various forms of ecoagriculture (organic farming, water efficient farming system, precision farming, etc.)
IR Iran	Not indicated
Laos	<p>Short-term needs:</p> <ul style="list-style-type: none"> ▪ Strengthen capacity building for government staff (Provincial Agriculture and Forestry Office (PAFO), District Agriculture and Forestry Office (DAFO)), farmer groups and farmer cooperatives ▪ Establish pilots of GP models <p>Long-term needs:</p> <ul style="list-style-type: none"> ▪ Strengthen laws linking GP development ▪ Strengthen GP development by creating awareness for the agricultural producers, particularly groups of agricultural cooperatives, agro-industry

	and other industries
Malaysia	Awareness and showcasing of GP models in agriculture
Mongolia	Not indicated
Nepal	Not indicated
Pakistan	Not indicated
Philippines	<ul style="list-style-type: none"> ▪ Renewed awareness raising/advocacy program on GP ▪ Need for continuous training and education/capability building on GP tools and techniques ▪ Need to institutionalize the monitoring/impact evaluation of GP initiatives ▪ Need to have a focal organization for GP programs
Sri Lanka	Not indicated
Thailand	<ul style="list-style-type: none"> ▪ Need innovative plant processes and products to increase productivity, safe environments and energy by using the natural inputs and natural energy, and promote recycle and reuse processes ▪ Need practical GP knowledge for the agricultural sector ▪ Need strong communication and promotion on producing and using organic products from the government
Vietnam	<ul style="list-style-type: none"> ▪ Need to take advantage of previous community-level projects ▪ Cooperate with other organizations to develop more GP projects in the agriculture sector

Findings and Comments

Participating member countries' GP needs in the agriculture sector can be summarized as follows:

1. **Agricultural technology:** agro-ecological methods (Fiji); innovative planting processes and products, natural materials and energy (Thailand).
2. **Capacity buildings:** forestry and agriculture agencies, farmer groups/cooperatives (Laos); ecoagricultural capacity for farmers and government staff (Indonesia); continuous training and education/capability building on GP tools and techniques, institutionalizing the monitoring/impact evaluation of GP Initiatives (Philippines).
3. **GP pilot projects:** develop GP models and pilots (Laos); develop more GP projects (Vietnam).

4. **Awareness building**, enhanced communication and promotion (Laos, Thailand); awareness building and showcasing GP model (Malaysia); renewed awareness raising/advocacy program on GP (Philippines).
5. **GP policies/legislation**: GP legislation linking GP (Laos); policies/regulations/financial incentives to speed up organic farming (Indonesia).
6. **Focal organization** (Philippines).

Industry

Table 9: Sector-specific (Industry) Findings of GP Needs of Member Countries

Member Country	Survey Result
Bangladesh	Not indicated.
Cambodia	<ul style="list-style-type: none"> ▪ Need support from development partners (both technical and financial) to expand GP pilot programs and projects nation-wide, that jointly promote the securing of natural resources, better environmental performance and improved productivity in manufacturing and industrial processing
Republic of China	<ul style="list-style-type: none"> ▪ Need to pursue high values, precision, intelligence and systematization in the manufacturing value chain
Fiji	<ul style="list-style-type: none"> ▪ Energy efficiency: need assistance with boilers, furnaces and managing electrical loads ▪ Waste management: recognized as the single most pressing issue that needs immediate action (including solid waste, plastics, animal waste and liquid wastes) ▪ Bio-fuel: government is pushing industries to consider utilizing bio-fuel or renewable energy as substitute fuel ▪ Recycling: need for increased recycling of paper, scrap metal, water, solid waste, plastics and car batteries ▪ Waste minimization: training needed on ways to reduce waste
India	<p>The same as in the summary for general needs and recommendations (Table 7).</p> <ul style="list-style-type: none"> ▪ Procedures for GP implementation schemes to be simplified, and the financial/technical assistance to be provided ▪ Useful information from every department, organization etc. should be

	<p>uploaded onto websites</p> <ul style="list-style-type: none"> ▪ Every year a national level workshop to be organized by all ministries/departments running any GP incentive schemes ▪ Guidelines need to be developed to certify environmental auditors and water auditors ▪ GP concept may be incorporated into college syllabuses, and other streams of education may also be brought in for creating awareness about GP ▪ Develop GP benchmarks in the area of energy consumption, water consumption, raw material consumption, etc.
Indonesia	<ul style="list-style-type: none"> ▪ Reduced, Recycle, Reuse (3Rs): concepts and application of the 3Rs for industrial activities ▪ Resource efficient technologies ▪ Environmentally sound technology development
IR Iran	Not indicated
Laos	Not indicated
Malaysia	Technology and fund assistance
Mongolia	Not indicated
Nepal	Not indicated
Pakistan	Not indicated
Philippines	<ul style="list-style-type: none"> ▪ Need for awareness raising on GP ▪ Need to conduct continuous training and education programs ▪ Need for continuous and targeted dissemination of GP best practices/experiences ▪ Improve marketing and promotion ▪ Need to set up/designate a focal organization for GP ▪ Need for funding support and tax incentives from the government ▪ Need for monitoring and impact evaluation of a GP program
Sri Lanka	Not indicated
Thailand	<ul style="list-style-type: none"> ▪ Need new/modern technology to increase efficiency of waste reduction and create an effective recycling or reuse system (especially innovation in the area of substitute or alternative materials) ▪ Need support (budget) for R&D from government ▪ Need knowledge and experience on using substitute materials, clean

	<p>energy, recycling and reuse of water, heat exchanging, eco-design and clean technology</p> <ul style="list-style-type: none"> ▪ Need GP experts who can consult and provide direction for improvement ▪ Need policies on tax reduction for implementing GP programs, including support for long-term loans with low interest
Vietnam	<ul style="list-style-type: none"> ▪ Promote the GP program within Vietnamese enterprises ▪ Implement GP projects (GP, MFCA and related methodologies) at both national and local/provincial level ▪ Enable GP capacity building of consultants (experts with practical and professional experience, as they are the core resources to develop GP program), to be practiced on site until 2020 ▪ Establish tailor-made training courses for SMEs ▪ Gradually decrease dependence of GP projects on outside funds. First in industry and service sectors, ask for participating enterprises to make contributions

Findings and comments: Participating member countries' GP needs in the industry sector can be summarized as follows:

1. **Technology assistance:** energy efficiency (boilers, furnaces, and managing electrical loads), waste management (solid waste, plastics, animal waste, and liquid wastes), bio-fuel, recycling (paper, scrap metal, water, and solid waste, plastics, car batteries), waste minimization (Fiji); industrial technology (Malaysia); waste reduction, recycling or reuse system (especially, innovation on substitute or alternative materials), substitutions of materials, clean energy, recycling and reuse of water, heat exchanging, eco-design, clean technology and expert/consultant assistance (Thailand); need to pursue high values, precision, intelligence and systematization in manufacturing value chain (ROC); 3R, resource efficient technologies, environmental sound technologies (Indonesia); monitoring and impact assessment of GP program (Philippines).
2. **Financial incentive/tax reduction policies:** financial incentive/tax reduction policies for GP implementation (Thailand); gradually increase domestic private financial contributions to GP projects (Vietnam); tax incentives (Philippines).

3. **Capacity building:** need experts to provide GP consultation and direction (Thailand); develop guidelines for certification for auditors, establish GP benchmarks for industries (India).
4. **GP awareness:** build awareness and showcase GP model (Malaysia); develop GP training courses for SME (Vietnam); training and education program, general GP awareness raising, improve marketing and promotion, focal organization (Philippines); annual GP workshop, information posted on websites (India).
5. **Funding assistance:** technology (Malaysia); R&D (Thailand); technical/financial assistance for GP scheme (India).

Services

Table 10: Sector-specific (Service) Findings of GP Needs of Member Countries

Member Country	Survey Result
Bangladesh	Not indicated
Cambodia	Not indicated
Republic of China	Not indicated
Fiji	<p>Efficient Technologies: hike in electricity tariffs and innovation drive investment in efficient technologies. For example:</p> <ul style="list-style-type: none"> ▪ Cloud computing leads to huge savings due to outsourcing of operations and cuts costs of hardware and electricity expenses ▪ IT Virtualization allows traditional IT server farms to shrink to lean operations ▪ Green IT concept: organizations consider products' energy ratings and disposal requirements
India	Not indicated.
Indonesia	<ul style="list-style-type: none"> ▪ Enhancing human capacity on environmentally sound resorts, hotels and estates ▪ Incentives for environmentally sound resorts, hotels and estates
IR Iran	Not indicated
Laos	Not indicated
Malaysia	Build awareness and showcase GP model in service sector

Mongolia	Not indicated
Nepal	<ul style="list-style-type: none"> ▪ Need to balance the needs of tourism development with environmental constraints to ensure both economic and ecological sustainability ▪ GP signifies a new paradigm of socioeconomic development aimed at pursuing economic and productivity growth while protecting the environment ▪ Application of the concept and practices of GP is deemed to be a very appropriate strategy in the context of ecotourism for socioeconomic development
Pakistan	Not indicated
Philippines	<p>GP Policies/Initiatives/Status:</p> <ul style="list-style-type: none"> ▪ Need to educate the public on GP including green products/services ▪ Need to provide tri-media mileage for greening initiatives ▪ Need a benchmark with other countries on promoting a green economy/products ▪ Need a GP training program for employees ▪ Need for investment support (e.g., tax incentives) ▪ Need for access to funding support ▪ Regular assessment, documentation and evaluation of GP program ▪ Establish clearinghouse on GP information ▪ Establish focal organization for GP
Sri Lanka	Not indicated
Thailand	<ul style="list-style-type: none"> ▪ Need GP experts to provide consultation and direction for GP improvement to service businesses ▪ Government must communicate and promote all eco-programs to people and motivate them to use these services ▪ Need policies on tax reduction for implementing GP programs, including support of long-term loans with low interest ▪ Need new/modern technology to increase efficiency of service and minimize cost
Vietnam	<ul style="list-style-type: none"> ▪ Promote the GP program within Vietnamese enterprises ▪ Implement GP projects (GP, MFCA and related methodologies) at both national and local/provincial level

	<ul style="list-style-type: none"> ▪ GP capacity building of consultants (experts with practical and professional experience, as they are the core resources to develop GP program (to be practiced on-site) until 2020 ▪ Establish tailor-made training courses for SMEs ▪ Gradually decrease dependence of GP projects on outside funds. First in industry and service sectors, ask for participating enterprises to make contributions
--	--

Findings and comments: Participating member countries' GP needs in the service sector can be summarized as follows:

1. **GP technologies:** ecotourism, energy efficiency, cloud computing, IT virtualization, green IT concept (Fiji); new/modern technologies to improve service efficiency (Thailand); green economy/product promotion benchmark (Philippines).
2. **GP awareness:** build awareness and showcase GP model (Malaysia); develop GP training courses for SME (Vietnam); provide media coverage, employee training program, GP information clearinghouse, designate focal organization (Philippines).
3. **GP capacity building:** increase environmentally sound knowledge in the tourism sector (Indonesia); GP experts needed (Thailand).
4. **Financial incentives:** long-term GP loans with low interest (Thailand); financial incentives for tourism sector (Indonesia); gradually increase domestic private financial contributions to GP projects (Vietnam); investment support (Philippines).

Conclusion and Recommendations

This chapter is divided into two parts. The first part discusses the recommended actions/activities for COE-GP/APO/NPOs gleaned from the member country reports, while the second part is the conclusion of this report and recommendations for COE-GP after summarizing the member countries' recommendations.

Recommended Actions/Activities for COE-GP/APO/NPOs

This part describes the recommendations on actions/activities for COE-GP/APO/NPOs, in order to assist the member countries in promoting and implementing GP. As with the other sections, the results can be divided into two categories: general findings which are applicable to all economic sectors; and sector-specific findings related to three focused sectors: agriculture, industry and service.

General (non-sector specific) recommendations

Table 11: General Recommendations (non-sector specific)

Member Country	Survey Result
Bangladesh	<ul style="list-style-type: none"> ▪ As the GP concept is new to many sectors, government should take initiatives to make people aware of GP and formulate social legislations and incentive plans to ensure GP success ▪ Establish relationships between national and international GP experts ▪ Establish relationships and links between NPOs and GP ▪ Encourage governmental and non-governmental organizations and enterprises to promote GP ▪ Provide GP consultancy services ▪ Design national GP movement
Cambodia	<p>For the industry sector:</p> <ul style="list-style-type: none"> ▪ Promote the linkage between government, universities and industries (UGI linkage) to support the growth of GP ▪ Raise the awareness of GP performance for both government and industry
Republic of China	<ul style="list-style-type: none"> ▪ Republic of China seeks to realize three goals: <ul style="list-style-type: none"> ▪ elevating global trade and economic status ▪ creating more diverse industrial structures ▪ facilitating balanced regional development ▪ Through the following industrial development strategies: <ul style="list-style-type: none"> ▪ upgrading conventional industry ▪ accelerating the promotion of emerging industries, service-oriented manufacturing and international high-tech services industries

Fiji	<ul style="list-style-type: none"> ▪ National Training and Productivity Centre (NTPO) is keen to work with COE-GP in implementing GP. ▪ Assistance needed in the following areas: <ul style="list-style-type: none"> ▪ Training workshops and seminars in GP ▪ Consultants in GP implementation ▪ Assistance through GP demonstration projects ▪ Development of model organizations ▪ Study missions for organizations to learn and implement GP ▪ Deployment of consultants in Fiji ▪ Attachment of NPO staff/industry personnel to overseas organizations to learn and implement in Fiji
India	<ul style="list-style-type: none"> ▪ APO also can play a role in uploading useful schemes which have a bearing on the GP of member countries for wider dissemination of information ▪ NPOs can play an important role in information dissemination by conducting seminars/workshops in the area of their strength ▪ As other APO member countries may come up with manufacturing policies emphasizing on green industries, it is suggested that APO may strengthen and enhance its GP courses to build up the capacity of member countries including India ▪ Generation of benchmarks for GP-related processes/projects to be started at APO/national level
Indonesia	<ul style="list-style-type: none"> ▪ Adopt government regulations on GP to speed up GP implementation ▪ Need diverse research proposals on GP at various scales [small, medium and large projects] ▪ Linking NPO, various government sectors, research agencies and private sector in developing national GP programs ▪ Public campaign on GP implementation should be more focused for both general and specific targets
IR Iran	NIPO needs strong external support (especially from APO) to fulfill the demands of stakeholders and deliver efficient and effective services.
Laos	Not indicated
Malaysia	<ul style="list-style-type: none"> ▪ Awareness training and utilized APO MCS program to develop GP model in agriculture, industry and service sectors

	<ul style="list-style-type: none"> ▪ Establish GP regional network/seminars to share success stories
Mongolia	<p>Steps and Need to promote GP:</p> <ul style="list-style-type: none"> ▪ Build GP awareness within education sector (e.g., kindergartens, schools and universities) ▪ Promote GP implementation cases through creating GP demonstration companies in industry, agriculture and service sectors ▪ Increase involvement of stakeholders and their capability ▪ Build interest groups such as GP club for the community ▪ GP can provide sustainable development through SME promotion ▪ Increase green investment (>2% GDP) on green infrastructure, renewable energy, and resource efficiency enhancement projects ▪ Improve relationship between government, NGOs, institutions and the private sector ▪ Promote GP initiatives (e.g., working with the younger generation) ▪ Improve information systems and use TV for GP promotion/creating awareness ▪ Possible model program: green mining development projects ▪ Develop national GP specialists for each level and sector ▪ Include cleaner production and GP issues in national policy and develop national GP strategy ▪ Develop ecological maps of big cities ▪ Build green development fund for promoting GP implementation, and find financial support ▪ Adopt and demonstrate GP methodology for all sectors ▪ GP awareness should start in the education/institution sectors such as kindergartens, schools, universities etc. ▪ GP can provide sustainable development through SME promotion ▪ Improve relationship between government, NGOs, institutions and the private sector
Nepal	<p>As GP is new to many businesses:</p> <ul style="list-style-type: none"> ▪ Essential to make the government aware of GP and take initiatives to educate SMEs ▪ The government needs to commit to environmental protection and

	establish environmental incentives for GP
Pakistan	<p>Needs and recommendations for GP promotion and implementation:</p> <ul style="list-style-type: none"> ▪ Create 'National Task Force for Promotion and implementation of Green Productivity' by involving GP stakeholders; provide opportunity for pooling GP resources, professionals and experts ▪ Make allowances for information exchange, networking and policy dialogue for the development of GP-related policy and strategies ▪ Formulate and design curricula and courses at grassroots levels, targeting students at engineering, agriculture and business management colleges and universities ▪ Establish permanent 'National Institution for Staff training' or 'Staff College for GP' under supervision of NPO. APO COE-GP can provide international experts and practitioners of GP to deliver lectures and share their experiences ▪ Develop a self-monitoring mechanism for reporting by each sector. APO can help to develop such a mechanism for reporting and monitoring. ▪ Adopt new and innovative networking techniques for engaging different stakeholders at different GP implementation stages.
Philippines	<ul style="list-style-type: none"> ▪ Develop and implement a GP advocacy and awareness raising program targeting top management/decision-makers, program managers and implementers. This could be done through promotional campaigns through tri-media coverage, overseas study missions for policy/decision-makers, pilot projects and conferences/workshops, among others ▪ Develop and implement capability building programs to build, strengthen and upgrade the competence of NPO staff and those of partners' institutions. Topics could include functional areas like: GP program development; results/outcome monitoring and evaluation, as well as thematic areas like new technologies in solid waste management, promotion of renewable energy, waste to energy systems, sustainable water (rain/storm) management, disaster and risk reduction management and green procurement, among others ▪ Build/expand the existing NPO pool of experts and facilitate access to technical experts and consultants on GP from APO-COE on GP, CPC and

	<p>other NPOs and international organizations to help in GP strategy development, program design and management, and capability building efforts of the NPO and partner organizations</p> <ul style="list-style-type: none"> ▪ Facilitate access to funding and/or investment support from government, private business sector and international donor agencies. (e.g., government budget appropriation, grants /aids from donors, and tax incentives ▪ NPO should establish/strengthen partnerships/collaboration with the CPC through the APO COE on GP program, to enhance institutional capacity in promoting GP (through training of NPO staff, accessing best practices and technical expertise on GP and other forms of assistance)
Sri Lanka	<ul style="list-style-type: none"> ▪ More training courses, workshops and seminars should be conducted for the state as well as the private sector in order to : <ul style="list-style-type: none"> ▪ sensitize top management ▪ increase awareness among producers, providers and consumers ▪ promote GP as an intelligent choice for the consumer through marketing ▪ convince state to formulate policies ▪ promote GP as an easy measure to achieve sustainability ▪ Local partnerships, international cooperation and networking are essential ingredients ▪ Economic development of Sri Lanka should be combined with GP; this can be achieved if the capacities at SLIDA are improved as they are the trainers of the top public servants ▪ Prioritizing planning and implementation in the private sector can be realized through capacity building in the Chambers of Commerce and Industry. National agendas for various aspects of sustainability should include GP as an essential ingredient. The Chambers of Commerce and Industry, Sri Lanka Association for the Advancement of Science, Ministry of Environment, Employers' Federation, Sustainable Energy Authority, Central Environmental Authority and Industry Associations etc. should be sensitized ▪ The SME sector is very keen to adopt green practices, and training of representatives can achieve good results ▪ GP consultants also need a refresher course as well as advanced training.

	<ul style="list-style-type: none"> ▪ The ability to penetrate the media for promotional work needs financial resources, but this can bring very positive and effective results ▪ Making available the publications in the two local languages is a 'must' to ensure success ▪ The manpower is available; financial resources are needed ▪ A comprehensive database with practitioners, consultants, trainers etc. will highlight the gaps on a national level
Thailand	<p>Recommendations for all sectors:</p> <ul style="list-style-type: none"> ▪ Some stakeholders prefer reducing resource consumption to reuse and recycle approach ▪ Provide eco-design concept ▪ Modification system should be designed to support various systems Promote clean technology ▪ GP approach should cover community activities ▪ Provide best/success cases of implementing GP including training, site visits and workshops ▪ Provide or update technologies and innovations in implementing GP ▪ GP should focus more on inputs, e.g., material consumption, natural material, organic material, reused and recycled material ▪ Most companies suggested that any investment in GP improvement should benefit from tax reductions
Vietnam	<ul style="list-style-type: none"> ▪ Cooperate with APO or other funds to launch specific Vietnamese GP website to find updates on GP implementation and GP strategy ▪ Establish and develop a GP network to link all GP training, consulting and promotion efforts in Vietnam ▪ Cooperate with APO and other organizations to establish GP guidelines for important industries/sectors in Vietnam (e.g., seafood processing, handcraft, foodstuff, dairy products and chemicals). Publish these guidelines on the APO website and at the Vietnamese GP center ▪ VPC/SMEDEC 2 should cooperate with APO to organize the national training of trainers and consultants on GP in Vietnam ▪ Develop training kits for the development of GP programs ▪ Cooperate with other funds to develop training programs that train general

	<p>management and accounting systems for companies prior to the introduction of GP concepts</p> <ul style="list-style-type: none"> ▪ Deliver GP content to university students ▪ Suggest the national long-term GP training courses with practical experiments, with support from APO and other international organizations
--	---

Findings and comments:

1. **GP training, workshops and seminars:** general GP area (Fiji); delivery of consulting service (Iran); GP model development (Malaysia); best/success cases, updated technologies, resource reduction, clean technology (Thailand); training of trainers, develop training kits and training courses (Vietnam); conduct GP seminars/workshops (India).
2. **GP implementation consultation:** general GP area (Fiji); facilitate access to GP technical experts and consultants (Philippines).
3. **GP demonstration projects, model organization:** general GP area (Fiji); GP model development (Malaysia); green mining (Mongolia).
4. **Regional GP network/websites:** general GP area (Malaysia and Mongolia); develop sectoral GP reporting system/mechanism, adopt new networking techniques (Pakistan); launch national website (Vietnam); establish/strengthen partnership/collaboration (Philippines); create a database in local languages (Sri Lanka); post information of useful schemes on websites (India).
5. **GP capacity building:** national GP expert/specialist, develop GP methodology (Mongolia); establish National Institution for Staff training or Staff College for GP (Pakistan); establish GP guidelines for specific industries (seafood processing, handcraft, foodstuff, milk products, chemical)(Vietnam); GP courses in universities (Vietnam); capability building programs for NPO staff and partners institutions (Philippines); strengthen APO-GP courses, develop benchmark for GP-related processes/projects (India).
6. **GP policy/strategy:** include clean production in policy (Mongolia); government GP regulations (Indonesia); financial/tax incentives to GP projects (Thailand).
7. **GP awareness building:** businesses and government (Nepal); promotional campaigns, tri-media coverage, overseas study missions for policy/decision-makers, pilot projects and conferences/workshops (Philippines); GP promotion on media, chambers of commerce and industry (Sri Lanka).

8. **Funding Access:** facilitate access to funding and/or investment support from government, private business sector and international donor agencies (Philippines); financial resources (Sri Lanka).

Sector-Specific Recommendations

The member countries' reports have not pointed out recommendations specific only to one sector. The general recommendations relating to developing appropriate GP knowledge, capacity building, networking, and pilot/demonstration projects, etc., shall be applicable to all sectors. Furthermore, the following recommendations based on member countries' sector-specific needs serve as a good base for APO COE-GP in developing its future action plan.

Agriculture (Table 8)

1. **Agricultural technology:** provide assistance on agriculture technologies. Examples of such technologies include: agro-ecological methods (Fiji); innovative planting processes and products, natural materials and energy (Thailand).
2. **Capacity buildings:** provide the following capacity building activities: agricultural capacity building of forestry and agriculture agencies, farmer groups/cooperatives (Laos); ecoagricultural capacity for farmers and government staff (Indonesia); continuous training and education/capability building on GP tools, techniques, institutionalizing monitoring/impact evaluation of GP initiatives (Philippines).
3. **GP pilot projects:** develop GP models and pilots (Laos); develop more GP projects (Vietnam).
4. **Awareness building:** enhanced communication and promotion (Laos, Thailand); build awareness and showcase GP model (Malaysia); renewed awareness raising/advocacy program on GP (Philippines).
5. **GP policies/legislation:** provide assistance on developing GP legislation linking GP (Laos); policies/regulations/financial incentives to speed up organic farming (Indonesia).

Industry (Table 9)

1. **Technology assistance:** provide technology assistance on the following areas: energy efficiency (boilers, furnaces, and managing electrical loads), waste management (solid waste, plastics, animal waste and liquid wastes), bio-fuel, recycling (paper, scrap metal,

water, and solid waste, plastics, car batteries), waste minimization (Fiji); industrial technology (Malaysia); waste reduction, recycling or reuse system (especially innovation concerning substitute or alternative materials), materials substitutions, clean energy, recycling and reuse of water, heat exchanging, eco-design, clean technology and expert/consultant assistance (Thailand); need to pursue high values, precision, intelligence and systematization in the manufacturing value chain (ROC); 3R, resource efficient technologies, environmentally-sound technologies (Indonesia); monitoring and impact assessment of GP program (Philippines).

2. **Financial incentive/tax reduction policies:** provide assistance on GP policies and/or funding: financial incentives/tax reduction policies for GP implementation (Thailand); gradually increase domestic private financial contributions to GP projects (Vietnam); tax incentives (Philippines); funding assistance for technology (Malaysia); R&D (Thailand).
3. **Capacity building:** provide assistance on: recruiting GP experts to provide GP consultation and direction (Thailand); develop guidelines for certification of auditors, upload GP information to websites, organize annual national workshop, simplify implementation procedures for GP schemes (India).
4. **GP awareness:** provide assistance on building GP awareness, including build awareness and showcase GP model (Malaysia); develop GP training courses for SME (Vietnam); training and education program, general GP awareness raising, improve marketing and promotion, focal organization (Philippines); incorporate GP concepts into college syllabuses, develop benchmark for GP-related processes (India).

Services (Table 10)

1. **GP technologies:** provide GP technological assistance on: ecotourism, energy efficiency, cloud computing, IT virtualization, green IT concept (Fiji); new/modern technologies to improve service efficiency (Thailand); green economy/product promotion benchmark (Philippines).
2. **GP awareness:** provide assistance on building GP awareness through: build awareness and showcase GP model (Malaysia); develop GP training courses for SME (Vietnam); providing media coverage, employee training programs, GP information clearinghouse, designate focal organization (Philippines).

3. **GP capacity building:** provide assistance with GP capacity building in the following areas: environmentally-sound knowledge on the tourism sector (Indonesia); GP experts needed (Thailand).
4. **Financial incentives:** Provide assistance on developing or providing: long-term GP loans with low interest (Thailand); financial incentives for tourism sector (Indonesia); gradually increasing domestic private financial contributions to GP projects (Vietnam); investment support (Philippines).

General Conclusion and Recommendations

After summing up the results from the needs assessment and recommendation parts of the country reports, the following summary of member countries' needs can be provided as follows (these needs may provide input for COE-GP or any NPO in developing their future roadmaps or action plans):

Capacity building

The promotion of GP relies heavily on the adoption of practical tools (including both green technologies and efficient management tools). Thus, GP stakeholders need to be aware and be able to apply such tools. GP consultants need to be trained and provided with such knowledge, so that they can teach the SMEs or organizations how to conduct GP practices. And GP training courses, workshops and seminars need to be offered to both GP consultants and businesses. In order to do so, training manuals and materials need to be developed, and examples of model GP organizations or implementation cases needed to be established. To enhance stakeholders' GP capability, the following activities needed to be pursued: develop training manuals, courses, best GP practices and case studies/examples; offer training courses, workshops and seminars.

Awareness building

In order to create an atmosphere to practice GP, the awareness of GP needs to be enhanced. This will involve raising the GP awareness of the businesses' management levels, government policymakers, consumers and environment groups or even the general public. These stakeholders may not need to be aware of the details of GP implementation. However, they need to know GP enough to consider GP in their decision-making processes. Approaches to increase GP awareness may include spreading the GP message through the media,

management meetings or linking with environmental and sustainability awareness activities, etc.

Promotion of GP adoption

An important step in encouraging the adoption of GP is to show the stakeholders the benefits of practicing GP. This can be done through the introduction of pilot GP projects or demonstration by GP organizations. The benefits and experiences gained through such demonstration projects can be used to convince peers and other industries how GP practices can be used to improve their performance and eventually the bottom line. The examples and case studies of these projects can also be inputted into the important knowledge base for the capacity building efforts.

GP Networking

As GPO member countries are at varying stages of GP implementation, it is likely that there are already similar experiences and examples that can be readily borrowed and modified. In this regard, networking can be essential in locating these technologies and experiences. Networking of GP knowledge and capacity/experts can result in the efficient locating and transferring of suitable GP knowledge without the efforts of repeating previous work. However, in many cases, such knowledge would need to be modified to suit local circumstances or converted into local languages to help with local knowledge dissemination. Based on the needs in the above four areas, the COE-GP may consider the following actions in designing its future work plans. Many of the tasks described below have already been practiced in several member countries, however, there are always opportunities to learn from past experience and maximize the potential benefits to other member countries.

1. **Help develop GP training manuals, case studies and promotional materials suitable for member countries lacking such materials.** This may involve identifying the member countries in need of such assistance, and developing or modifying existing training materials to make them suitable to local conditions.
2. **Help develop demonstration/pilot projects and model organizations in member countries in need.** Again, it is important to identify member countries that need this kind of assistance the most, and conduct cost-benefit analysis to achieve maximum impacts of such projects.

3. **Develop a network of GP knowledge and capacity.** In developing GP training materials or conducting demonstration projects, it is important to be able to identify existing experts and knowledge. Thus, there is a need to establish a network and database to link all such knowledge and GP practitioners. This kind of GP network and database are already in existence in several member countries, so again the focus should be on using existing successful experiences to develop local networks in member countries without such networks, and allowing these to link with APO and other members' existing networks.
4. **Conduct training courses, workshops and seminars.** As COE-GP is able to gather existing GP knowledge and resources, it is important to be able to disseminate such knowledge through GP training courses, workshops and seminars in member countries with such needs. These kinds of events will allow COE-GP to pool available GP experts and financial resources to offer member countries help.
5. **Building GP awareness through above actions.** COE-GP's such actions may be conducted alongside promotional media campaigns, or specifically to targeted private sectors or policymakers. This should help with bringing GP concepts into daily activities and policymaking processes.
6. **Follow-up on 2010 Jakarta Recommendations and 2012 Taipei Declaration.** In pursuing the above tasks, the COE-GP may consider following-up on both the Jakarta Recommendations adopted during the 2010 APO GP Conference held in March 2010, Jakarta, Indonesia, and the 2012 APO GP Conference held in August 2012, Taipei, Taiwan, ROC. The following recommendations are related to GP:
 7. Governments should: (1) develop green growth policies to support financial institutions' eco-activities; (2) develop regulatory frameworks to encourage companies' full disclosure (including sustainability); (3) implement continuous education and training for public servants; and (4) strengthen public-private sector partnerships for productivity-related initiatives.
 8. Businesses should: (1) establish benchmarks on business performance and other indicators to support decision-making processes; (2) establish performance management schemes, and proactively pursue multilateral and bilateral cooperation in technology and innovation development and deployment in key areas; and (3) financial institutions should develop capacity for conducting eco-finance and eco-business, such as technology assessment and risk management.
 9. APO should: (1) strengthen the capacity of National Productivity Organizations; (2) expand the productivity knowledge sharing and consulting networks among member

economies; (3) develop and adopt regional frameworks to facilitate the flow of GP knowledge and technology in strategic sectors and industries; (4) encourage all stakeholders, especially public sector policymakers and private sector decision-makers, to strengthen their capacity to contribute to GP; and (5) ensure full support to the productivity movement by the policy and decision-makers and top management.

Proposal of Concrete Action Plan

Existing APO and COE-GP Projects and Action Plans

Prior to the finalization of this study report on the member countries' needs in the three focus sectors, the APO has approved and/or planned for several short-term (2014–2016) GP projects relevant to the member countries' recommended areas; and the COE-GP has also proposed the dedicated action plan and initiatives for the next five years (2014–2018). These planned actions/projects are summarized below for reference, so that this report can recommend concrete actions which build on existing projects/plans and also complement and expand their coverage and impact.

APO's 2014–2016 GP Projects/Action Plan

1. Agriculture sector

- Workshops/forums/training courses: innovative farming practices; climate change effects mitigation/adaptation (in Fiji, Bangladesh); organic produce certification (in Iran).

2. Industry sector

- Study: advanced green technology (Indonesia); smart grids (ROC.)
- Training courses/workshops: energy efficiency; GP consultancy/GP trainers (Pakistan); GP learning; GP manual development; environmental labels (Laos); ISO 50001 (Korea); material flow cost accounting (Pakistan, Sri Lanka)
- Conferences: environmental economics; material flow cost accounting (Indonesia); eco-product fair
- Development/expansion: eco-product database; network of GP Advisory Committee

3. **Service Sector:**

- Workshops: agrotourism business development (in Indonesia); eco-cities development (in R.O.C, Singapore, Malaysia)

COE-GP's 2014-2018 Action Plan

1. **Continued operation of the Asian Green Productivity Exchange Platform**

This is the platform on which all future COE-GP actions and activities are launched. All the administrative affairs related to COE-GP activities are managed by this platform. It consists of the following three groups:

- a. COE-GP Advisory Committee: this committee is formed by leaders of GP stakeholders, and is tasked with providing COE-GP with policy direction through meetings at least twice a year
- b. COE-GP Office: this office is responsible for coordinating and managing all COE-GP's daily affairs and related projects. It also serves as the window of contact with all domestic and international stakeholders and organizations.
- c. Technical group meetings: as COE-GP will be involved heavily in developing and disseminating GP technologies, it will rely on multiple groups of technical experts for technology input. COE-GP will form these groups of experts and organize annually at least 30 technical expert meetings, so that these experts can provide COE-GP with the necessary technology information and technical policy input.

2. **Establish Asian Green Productivity Team.** The concept of Asian Green Productivity Teams is envisioned as teams/groups of GP experts who will travel to APO member countries on request, in order to provide technology assistance and foster bilateral or multilateral cooperation to the member countries. Each team will consist of at least four experts, and the teams will provide assistance to at least eight member countries. Four technology areas have been tentatively selected as the focus of the expert teams: resource recycling, green energy, green factories and ecoagriculture. After the GP teams' visits to the member countries, they will be asked to provide GP feedback from the visited countries to interested parties in the ROC through information seminars. The purpose of such seminars is to inform domestic stakeholders and solicit interest in future cooperation projects and/or financial assistance. The GP teams will also prepare GP technology manuals and related

documents, detailing the technology contents of their service and the achievements attained during their overseas trips, which can be utilized by other member countries.

3. **Promote Asian GP Excellence Benchmarking and Green Leadership.** The COP-GP will promote the benchmarking of Asian GP excellence through the following activities:
 - a. Organize annual International GP Conferences: on behalf of COE-GP, APO will invite GP experts from member countries and international organizations to attend this annual three-day conference to be held in Taipei
 - b. Organize Green Leaders Benchmarking Workshops/Seminars: five annual workshops/seminars will be held to gather industry/business leaders and spread the concept of GP benchmarking and green leadership
4. **Enhance Stakeholders' GP Awareness.** The following activities will be conducted to improve the stakeholders' awareness of GP:
 - a. Green Excellence Enterprise Award: this award will be presented to model enterprises in three focused sectors capable of demonstrating excellence in pursuing GP
 - b. APO-GP website in both Chinese and English versions: this website will be the window for disseminating all technical and non-technical information relating to COE-GP's activities and relevant projects. A monthly GP newsletter will also be produced as part of this website delivery.
 - c. Additional promotional materials: the COE-GP office will produce press releases, journal articles and promotional features and will highlight project events through print and electronic media. The purpose of such activities is to improve COE-GP's exposure stakeholder and the general public's GP perception.

Proposed Supplementary Action Plan

Based on the needs for GP promotion expressed by member countries' experts participating in this study, as well as taking into consideration the existing plans/projects of the APO and COE-GP, the following additional actions may be considered by COE-GP in planning its future activities:

1. **Expand Asian Green Productivity Teams into a Regional Expert Network.** The concept of Asian green productivity teams and Network of GP Advisory Committee (GPAC) may be expanded into a Regional Expert Network. As the green productivity teams provide technical assistance in member countries, they can and should team up with local experts, and this kind of bilateral and multilateral cooperation can be expanded into a Network. COE-GP's original four focus areas of resource recycling, green energy, green factories and ecoagriculture can later be expanded to meet member countries' additional needs. The network can be expressed in a directory of experts, their expertise and associated GP activities, followed by information on joint GP projects and activities performed by the network of experts.
2. **Expand COE-GP website into web portal for disseminating APO-GP information.** Several national experts have expressed the need for/interest in establishing and/or expanding their national GP website for disseminating local and regional technical GP information. To help meet their needs in this respect, COE-GP may seek to expand the current COE-GP website into a portal for seeking national and regional GP information. COE-GP can also compile the GP information from APO member countries into a searchable database, and provide links to original information sources and technical experts. Moreover, COE-GP can offer APO member countries technical and financial assistance in establishing the contents and delivery of such information through national and/or regional GP websites.
3. **Conduct the study and provide information on the roles of public sector incentives for GP activities.** Multiple experts have stressed the need for public sector participation and the provision of financial incentives to promote GP activities in the private sector, especially for SMEs. It may be feasible for COE-GP to take up the task of studying the existing financial incentives for promoting GP activities in member countries, and conduct analysis of the costs and benefits of such assistance. Results from this kind of study should be of great value in informing member countries' public decision-makers as to whether to offer additional incentives.

4. Conduct a study on the optimal approach for building GP capacity in member countries.

Most participating experts in this study have agreed with the need to strengthen the development of national GP capacity through various means including workshops, training courses, GP guidelines, GP case studies, consulting services, technical assistance etc. Some have even suggested the use of dedicated educational institutions to achieve such a goal. It may be worthwhile for COE-GP to study the best means/approaches to quickly build up interested parties' capacity related to GP practices. For example, this kind of study may find it cost-effective for COE-GP to establish a dedicated/specific educational institution/training center (or GP training program) in ROC, and offer basic introductory GP knowledge to seed trainers from member countries. After completion of the introductory/general training in the ROC, the seed trainers may then add/develop local contents and deliver more national training in their respective countries. A stronger case for the establishment of a GP training center in ROC is presented as follows:

- 5. Establish GP Training Center in ROC.** As the COE-GP will likely become the main window or channel for disseminating GP information within the APO member countries, whether through GP expert teams, Asian GP exchange platform or GP technical meetings and conferences/workshops, it is also natural that COE-GP can and will become a GP training center for APO. With numerous GP technical experts and productivity personnel expected to be in touch with or attending activities coordinated through COE-GP in Taipei, it is feasible and cost effective that they can all become providers or receivers of GP information and technologies through the COE-GP Training Center. To begin with, the GP Training Center within COE-GP can focus on providing GP training for high-level managers and/or seed trainers from member countries invited to Taipei to participate in COE-GP-sponsored GP activities, conferences or workshops. Eventually, COE-GP can gather comments and views from member countries to broaden the scope and revise the focus for the provision of GP training. However, the main point of having a training center within COE-GP is for the sake of resource efficiency, so as not to waste the gathering of information and people so full of GP knowledge in COE-GP activities. As compared with ad-hoc training workshops or seminars, a training center can become a better and more permanent depository of GP knowledge, which can be easily retrieved, reproduced and delivered to persons in need of such knowledge.

6. Determine sectoral focus areas for GP promotion in 2020 GP Development Roadmap.

Based on APO's GP action plan/projects for 2014–2016, several sectoral focus areas have been selected with projects funded, including but not limited to: agriculture (climate change mitigation/adaptation, green/innovative practices, organic certification); industry (energy efficiency, ISO 50001, eco-label, material flow cost accounting); service (agrotourism, eco-cities, etc.). As a part of its process for developing the 2020 GP promotion roadmap, COE-GP should consider funding a study to determine which of these areas would continue to be focused on up until 2020, and which additional areas should be addressed, so that APO members can develop projects relevant to these areas and seek funding opportunities.

7. Become a clearing house for GP information and enhance funding opportunities.

It is apparent from this study that APO member countries vary in their technical and financial needs and capacities regarding GP implementation. Therefore, as a center dedicated to promoting GP within the APO, COE-GP should play the central role in providing APO member countries with GP information related to funding opportunities, as well as actively seeking GP funding from donors within APO member countries, and matching the funding with projects in need of financing. COE-GP should work with the APO Secretariat and NPOs in member countries to decide which mechanism/scheme it should use, in order to supplement the existing proposal and funding mechanism within APO. The purpose of this work is to let the establishment of COE-GP improve the current funding situation for GP promotion within APO member countries, through better dissemination of GP information related to potential projects and funding opportunities. It would be even better if COE-GP could enhance and/or pursue the contacts with potential private and public donors to secure additional funding for GP promotion.

References

1. Country reports of GP Needs Assessment Study
2. COE-GP 2014 Project Proposal (internal document)
3. The 2010 Jakarta Recommendations on Green Productivity to Enhance Competitiveness
4. The 2012 Taipei Declaration on Productivity and Sustainable, Inclusive Development in the Asia-Pacific
5. APO Green Productivity 2014 Approved Projects
6. APO Program of Action 2015-2016

List of Experts

Chief Expert

China, Republic of

Dr. Ning Yu

Senior Advisor

Environment and Development Foundation

National Experts

Bangladesh

Mr. S.K. Amzad Hossain

Project Director

Greater Dhaka Sustainable Urban Transport Project,

Local Government Engineering Department

Government of Bangladesh

Cambodia

Mr. Chea Sok

Chief of Science and Technology Office

Department of Industrial Techniques, General

Department of Industry

Ministry of Industry, Mines and Energy

China, Republic of

Mr. George, Shin-Ru Tang

Researcher

Industrial Technology Research Institute

Fiji

Mr. Sachin Avikash Deo

Deputy Director

National Training and Productivity Centre

Fiji National University

IR Iran

Mr. Mohammad Mokavven

Planning Expert

National Iranian Productivity Organization

India

Mr. Mohd. Javed Pervez

Director

National Productivity Council

Indonesia

Dr. Chay Asdak

Lecturer and Researcher
Faculty of Agriculture Industrial Technology
Padjadjaran University

Lao PDR

Mr. Nhoungthong Sihanath

Head of Training and Information Service Division
Department of Agriculture Extension and
Cooperative
Ministry of Agriculture and Forestry

Malaysia

Mr. Yun Fung Yap

Managing Director/Green Productivity Consultant
Centrex Training and Consultancy

Mongolia

Ms. Enkhzul Baatarkhuu

General Manager
Mongolian Productivity Organization

Nepal

Mr. Kalyan Ghimire

Research Officer/Consultant
Productivity Promotion Division/APO Liaison
Function Branch
National Productivity and Economic Development
Centre

Pakistan

Mr. Kashif Majeed Salik

Senior Research Associate
Sustainable Development Policy Institute

Philippines

Mr. Carlos Auxillan Sayco, Jr.

Vice President
Development Academy of the Philippines

Sri Lanka

**Mr. Rajapaksa Mannikkunambi Raveendra Vijithsen
De Silva**

Consultant

Social and Environmental Management and
Sustainability

Aitken Spence Hotel Managements (Pvt.) Ltd.

Thailand

Dr. Tawkiat Noisomlee

Productivity Consultant

Thailand Productivity Institute

Vietnam

Ms. Thi Phuong Yen Nguyen

Consultancy Deputy Manager in charge of R&D

Small and Medium Enterprises Development

Support Center 2