Country Strategy Paper
Cambodia
Extension period: July 2010-June 2013

Pesticide Risk Reduction "IPM Component"/Towards a non-toxic environment in South East Asia – Phase I
(GCP/RAS/229/SWE)

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1 Background and Rationale

1.1 IPM training and implementation in Cambodia

The Cambodia National IPM Programme

1.1.1 Brief history:

The Ministry of Agriculture, Forestry and Fisheries (MAFF) initiated the pilot phase of the Integrated Pest Management (IPM) Programme from 1993 to 1995 after "The Environment and IPM" workshop which was held at the Royal University of Agriculture, Phnom Penh. At that time Cambodia joined 12 other Asian countries as part of the FAO Inter-Country Programme in Rice IPM in South and Southeast Asia with technical assistance and financial support from FAO (under TCP arrangements), IDRC and IRRI. FAO supported Cambodia in the implementation of a Season-long Training of Trainers Course (TOT), a Farmer Trainer Orientation Course (FTOC) and several Farmer Field Schools (FFS) in 1996 before Cambodia joined the FAO Southeast Asia Regional Vegetable IPM Programme (GCP/RAS/168/AUL) in 1997.

In 1998, MAFF officially declared Integrated Pest and Crop Management (IPCM) as one of the country's key crop production strategies with the aim of making IPM the standard approach to crop management in Cambodia. In 2002 the MAFF issued a Ministerial Proclamation (*Prakas*) on the establishment of "The National IPM Programme" to facilitate and coordinate all IPM activities in Cambodia irrespective of crop commodities and donor agencies involved.

The National IPM Programme is positioned within MAFF and the General Directorate of Agriculture (GDA) is responsible for its implementation. The National IPM Programme is currently operating in 18 major agricultural production provinces plus Phnom Penh municipality. The implementation of the Programme has been in close co-operation and collaboration with other concerned ministries, provincial departments of agriculture, local and international organizations and research institutions at all levels.

The National IPM Programme is/was supported through several major projects including FAO-IPM (rice and vegetable, 1995-present), APIP-IPM Sub-Component (rice, 2000-2005), DANIDA-IPM Farmer Training Project (rice, watermelon, maize and rice-fish Integrated Farming System, 2000-2007, and World Education's IPM-in-Schools Project (1998-present). A total of about 32 other international, local and non-governmental organizations[1] have also supported IPM activities in Cambodia. In recent years, the local CSOs CEDAC (Centre d'Etude et de Développement Agricole

[1] European Union, PRASAC, United Nations Children's Emergency Fund, CARERE, IFAD, ADESS, HI, REDDBANA, CWS, Catholic Relief Services, NPA, OXFAM, PADEK, ANS, APHESA, CAAEP, CARE, CARITAS, CASD, CIDSE, CONCERN, GRET, KEKS, JVC, MCC, NAPA, READ PROJECT, SAMAKEE, WVC, ADDA, ZOA and CIDA

Cambodgien/Cambodian Centre for Study and Development in Agriculture) and ATSA (Agriculture Technology Services Association) have been most closely involved in maintaining, enhancing and providing sustainability to the achievements, impacts, networks and structures of the National IPM Programme. In 2010, the Government of Cambodia gave its first contribution to farmer training through FFS programmes in the amount of US$26,152 bringing the total estimate funding for IPM field activities for the period 2000-2010 to US$6,388,862 from NGOs and other international development organizations. The FAO Regional IPM-PRR Programme contribution to this amount is only US$1,262,401 or 20%, demonstrating the uptake of field school programmes by other donor-assisted projects and organizations. Information on contributions from Local Commune Councils is yet to be determined.

1.1.2 Cambodia membership of the FAO Regional Vegetable IPM Programme

In 1997 Cambodia joined the FAO Southeast Asia Regional Vegetable IPM Programme. This FAO Vegetable IPM Programme continues to provide support to the National IPM Programme and has focused its work on IPM development for major vegetable cash crops. In recent years, this FAO Programme has also assisted the Cambodia National IPM Programme to develop IPM for several other crops (e.g. mungbeans, fruit crops) whereas support for *rice* IPM training has also remained on the agenda.

1.1.3 Vegetable IPM Achievements (1996 – June 2010):

A summary of major activities and outputs for this period includes the following:

- Review of production and protection practices for use in curriculum development for ToT and FFS
- Development and strengthening capacities of trainers through 3 TOTs for government staff for 98 participants (38 women)
- Development of Training and Ecological Guides on Cabbage and Tomato and upgrading of the Pesticide Book
- Organization of two national conferences on pest and pesticide management intended to generate policy support for IPM
- Two Monitoring and Evaluation workshops for 40 participants (14 women)
- Five National Training Courses/Workshops[2] for 326 participants (76 women)
- 503 FFSs on vegetable and rice for 11,913 farmers (5,378 women)
- Support to follow up activities including 195 action research/field experiments by farmers and 157 post-FFS on vegetable and rice for 2,484 farmers (1,150 women)
- Support to 30 Farmers' Associations on rice and vegetable with a membership of 503 farmers (2216 women)
- 119 Farmer Congresses on rice and vegetable in 9 target provinces attended by approximately 6,728 farmer participants (2,981 women)

[2] Workshop on Mass Rearing and Utilization of Earwigs as a Biological Control Agent; Workshop GO-NGO Collaboration for Pesticide Risk Reduction; Vegetable Disease Diagnosis, Ecology and Management Training Course, National Workshop on Implementation and Revolution of IPM Activities, National Workshop on Planning and IPM Programme Strategy Development

- 16 Refresher Courses for 553 participants (144 women) comprised of PCs, DTs and FTs
- 16 Farmer Cross Visits for 587 IPM-PRR FFS alumni (246 women)
- 72 IPM Trainers' Monthly Meetings in 9 target provinces
- 34 Seasonal Evaluation and Planning Meetings in 9 target provinces,
- One Technical Meeting on SRI for 48 participants (11 women)
- Support for thesis writing on *IPM Training Impact in BTB & PV* for two Bachelor's degree students
- PRA on Mungbean Production in Battambang, Kampong Chhnaing and Siem Reap Provinces
- Three Farmer Trainers' Orientation Course for 98 participants (35 women)
- Five National Coordination Meetings for 74 participants (16 women)
- Pesticide Risk Awareness Campaigns in 6 villages in two provinces (Battambang and Prey Veng) involving 270 farmers (80 women)

1.2 Current Context and Rationale for Community Education for Pesticide Risk Reduction

1.2.1 Agriculture Production, Plant protection and Pesticide use in Cambodia

Rice is a major staple food crop in Cambodia and rice paddies account for approximately 70% of farmland. Rice is cultivated in diverse ecosystems (irrigated, rainfed, upland and lowlands), with highest yields of 4.126.tons/ha obtained in the irrigated lowlands during the dry season (Table 1). Distinct rice production seasons in Cambodia are the wet/rainy (June-October) and dry seasons (December-April). 2009-2010 MAFF statistics (Table 1) report a total cultivated area of 2,719,080 ha and average yields of 2.84 tons per hectare. However, from 2006-2010, rice Brown Plant Hopper outbreaks have occurred in provinces along the Vietnamese border, including in Svay Reing, Prey Veng, Takeo, Kampot and Kandal.

Table 1. Rice Production in 2009-2010

Description	Wet season	Dry season	Total
Cultivated area	2,334,228 ha	384,852 ha	2,719,080 ha
Average Yield	2.62 tons/ha	4.126 tons/ha	2.836 tons/ha
Production	6,001,385 tons	1,584,485 tons	7,585,879 tons

(Source: Ministry of Agriculture Forestry and Fisheries, April 2010)

In addition to the problem of 'hopperburn', plant hoppers also vector viruses that can cause grassy stunt and ragged stunt diseases. During the 2006-10 period, thousands of hectares of rice in these provinces were reportedly infested with high populations of BPH and infected by these two virus diseases. Chemical insecticides were used to deal with this problem. MAFF has ordered the Provincial Departments of Agriculture to launch campaigns to use nets to collect BPH. With FAO support, the "BPH escape strategy", now actively promoted by MAFF, has also been introduced from Vietnam to protect young seedlings from the peak of BPH migration and possible disease infection.

Vegetable crops are the second most important commodity after rice. Vegetables provide an affordable source of nutrition and cash for lower income families, especially for those smallholders with access to irrigation water from rivers, lakes, creeks and open wells. The major vegetable crops include cabbage, Chinese cabbage, onion, lettuce, tomato, cucumber, squash, shallot, gourds, beans and chilies. The major vegetable producing provinces are Kandal, Kampot, Siem Reap, Takeo, Kampong Cham and Battambang. The country's total vegetable production from two seasons over the period 2009-2010 was 322,731 tons (Table 2).

Table 2. Vegetable Production in 2009-2010

Description	Wet season	Dry season	Total
Cultivated area	28,474 ha	21,804 ha	50,278 ha
Average Yield	5.744 tons/ha	7.30 tons/ha	6.419 tons/ha
Production	163,555 tons	159,176 tons	322,731 tons

(Source: Ministry of Agriculture Forestry and Fisheries, April 2010)

Although these statistics sound impressive, the per capita consumption of vegetables in Cambodia is much lower than the recommended intake. Considering this, assisting farmers to produce high quality and nutritious vegetables in sufficient quantities to satisfy individual household consumption requirements is of vital importance. Also, there is a growing demand for 'clean/safe' vegetables at local fresh markets, supermarkets, restaurants and hotels catering for international visitors. Cambodia still imports a lot of vegetables from neighboring countries especially during the off-season to meet market demand.

The potential benefits horticulture can provide to Cambodian people in terms of nutritional and economic development is significant. However, there are still many challenges to overcome before farmers are empowered with the knowledge, skills and tools to produce healthy and safe horticultural crops. Challenges include the selection of cultivars (varieties) with desirable characteristics such as marketability, disease resistance and yield, the ability to manage insect and disease pests and the infrastructure and technology to deliver produces to market. Further challenges result from the prevailing habits of farmers such as an overdependence on harmful inputs such as pesticides, the porous nature of national borders that facilitates the distribution of pesticides and the lack of regulatory frameworks and their enforcement.

A summary of the official status of the agro-chemical industry in Cambodia comparing data between 2006-2007 and 2009-2010 follows (Table 3):

Table 3. Status of the agro-chemical industry in Cambodia, 2006-2007 and 2009-2010

Activity	2006-2007	2009-2010
Agricultural material Business Permit granted	22 companies	33 companies
Agricultural materials Registration Certificate granted	116 kinds of products items through 18 companies	403 kinds of products items through 42 companies
Agricultural material Importation License granted	27 companies	63 products through 51 companies
Fertilizers	123,258 tons/year	172,020.5 tons/year
Chemical Pesticides	532 tons/year	793 tons/year

(Ministry of Agriculture Forestry and Fisheries, April 2010)

The foregoing discussions highlight the urgent need for a programme addressing pesticide risk reduction, including promotion of Integrated Pest Management (IPM).

1.2.2 Pest and Pesticide Management Policy Context

The use of highly toxic WHO Class 1a and 1b pesticides continues to cause considerable concern in Cambodia. Whereas a ban on importation of WHO Class I pesticides into Cambodia took effect in 2003, the products are still available to farmers. The Cambodian government and its departments are taking some steps towards strengthening the regulatory framework and restricting the availability and use of banned agricultural chemicals while it continues to promote alternative pest management practices. Yet, the urgent need to further reduce the economic, health and environmental risks associated with current pesticide use practices still remains.

Pesticides are commonly used in agriculture, public health and in households. There are no domestically produced agricultural chemicals in Cambodia. About 85% pesticides in the country come from Vietnam and Thailand and the other 15% from China. The majority of these pesticides are unlawfully imported into the country and, without any major individual agro-chemical distributors in Cambodia, most pesticides are sold in relatively small quantities by a multitude of uneducated and non-licensed market traders contrary to official reports of a few companies that are licensed to sell. Labels, if present at all, are often in languages that Khmer farmers can not read although a Government directive has been issued on re-labelling all pesticides in Khmer.

The current state of this unregulated industry presents non-quantified, but assumingly significant, costs to human health, the environment and impedes the development of a viable agricultural export sector. At present, there is no accurate monitoring of pesticide residues in food and drinking water.

Progress made towards building a regulatory framework for the management of pesticides in Cambodia includes a Sub-Decree on Standards and Management of Agricultural Materials (1998), followed by a succession of further regulations including the establishment of the Bureau of

Agricultural Materials Standards (BAMS) within MAFF. This Bureau is charged with implementing, monitoring and enforcing pesticide regulations and the maintenance and regular updating of a pesticide registration scheme that includes only those chemicals that can be legally imported, distributed or used. The list of permitted, restricted or banned pesticides, categorized according to active ingredients, is the main factor in determining which products can be registered.

Another progress on the regulatory aspect is the formulation of a Law on Pesticide and Fertilizer. In early 2010, MAFF established a committee led by the Department of Agricultural Legislation (DAL) to put the Law together and the final draft has been submitted to the Council of Ministers for further inter-ministerial discussions prior to parliamentary procedures for adoption.

Alternative pest management practices have been promoted through the expansion of the National Integrated Pest Management (IPM) Programme by both the Cambodian government and NGOs. These institutions and organizations have worked together to establish a Pesticide Reduction Network to develop awareness of the risks associated with pesticide use amongst farmers.

Furthermore, MAFF has been engaged in examining and implementing various international legal guidelines and instruments relating to regulating the trade, distribution and use of pesticides in Cambodia. These include pledged adherence to the FAO Code of Conduct on the Distribution and Use of Pesticides, the Stockholm Convention on Persistent Organic Pollutants, and the WTO sanitary and phytosanitary measures. Additionally, MAFF has approved the formation of a Working Group that will prepare documents in Khmer on the Rotterdam Convention for submission to and approval by the Council of Ministers in preparation for Cambodia's ratification of the Convention.

1.2.3 Prior and Ongoing Pesticide Risk Reduction Efforts

Many efforts related to pesticide risk reduction have been made by governmental and non-governmental organizations with a number of programmes that have promoted safe alternatives to the use of pesticides. The most prominent initiative is the National IPM Programme that works toward empowering farmers to make more informed decisions when producing and protecting crops, reducing the use of chemicals, particularly pesticides, and promoting sustainable farming practices. The National IPM Programme focuses on production sustainability and efficiency, safeguarding human and environmental health and ensuring food security and food safety.

IPM emphasizes the use of biological control and the conservation of beneficial insects and other animals. Monitoring of the agro-ecosystem through observation and analysis is used as the basis for making informed management decisions. The Swedish-supported Pesticide Risk Reduction Programme, implemented as part of the FAO Regional IPM Programme, commenced in May 2007. The project aims to eliminate the use of hazardous and persistent agro-chemicals through IPM Farmer Training in conjunction with better access/utilization of alternative pest management options and support for National Pest and Pesticide Management Policy Reform. The Programme has demonstrated considerable reductions in pesticide use by trained farmers, most of who have shifted from hazardous to softer (bio-) pesticides, significant yield increases and clear cost benefits in both rice and vegetable production. For example, a study on the impact of farmer education on changes in the quantity and type of pesticides used in the country (Figures 1 and 2) shows a reduction in the use of WHO Class 1a pesticides of about 5 liters per hectare among farmers who received direct training in IPM FFS and no reduction in the same class of pesticides among the control group. The reduction in the use of pesticides could improve farmer livelihoods as well as the health of farmer applicators and their rural environments.

Figure 1: Battambang Province: Change of Pesticide Use (in liter/household per year)
(Baseline survey in 2007-08 and Impact survey in 2009-10, N=250 Households)

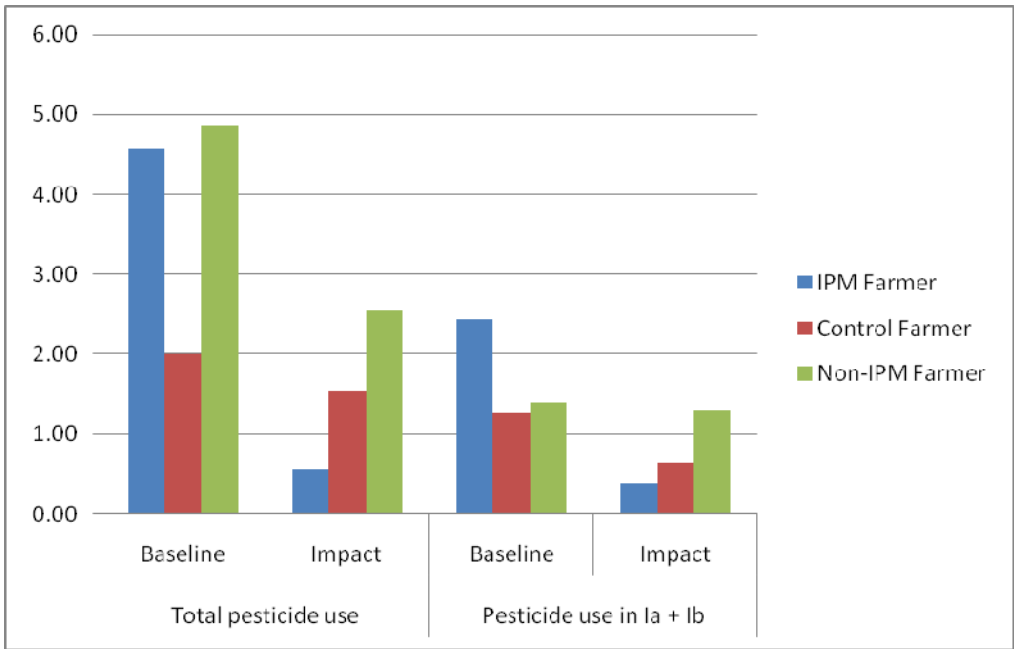
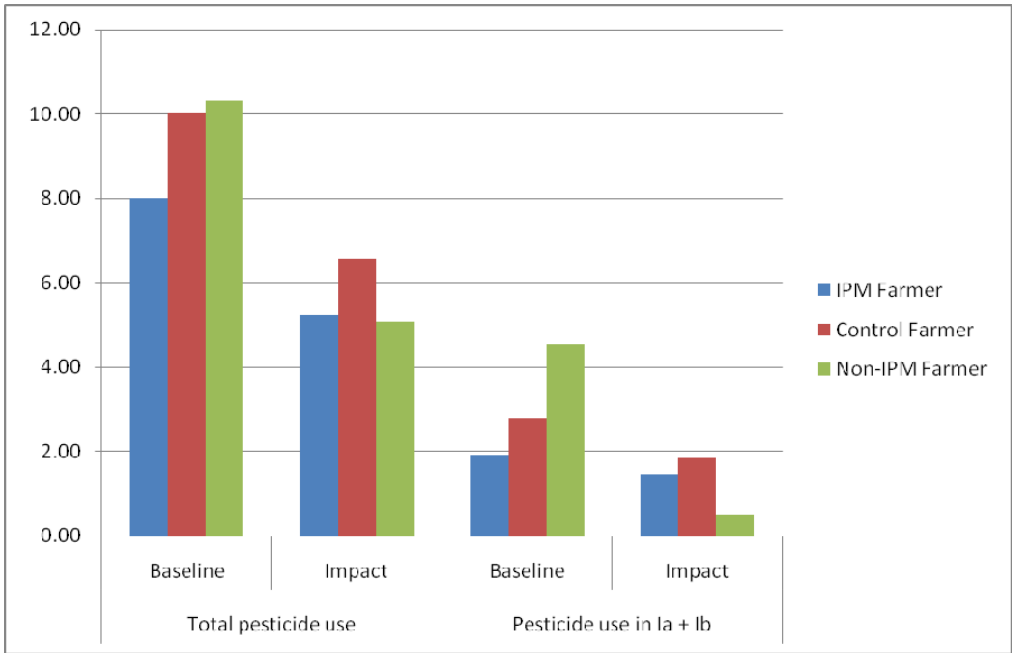


Figure 2: Prey Veng Province: Change of Pesticide Use (in liter/household per year)
(Baseline survey in 2007-08 and Impact survey in 2009-10, N=250 Households)



As of June 2010, with support provided by the FAO Pesticide Risk Reduction Programme, the National IPM Programme has supported the following activities:

- 220 Farmer Field Schools and 116 post-FFS activities for 7,469 farmers (3,300 women)
- Organization of 30 Farmers' Clubs for 503 farmers (216 women)
- Pesticide risk awareness campaigns in 6 villages in two provinces (Battambang and Prey Veng) involving 270 farmers (80 women)
- 62 Farmer Congresses involving 3,806 participants (1,574 women)
- 16 cross visits involving 587 farmers (246 women)
- Participatory Rapid Appraisal and Action Research for Mungbean IPM training curriculum development in three provinces around Tonle Sap Lake involving 130 farmers (41 women)
- Farmer Trainer Orientation Course for 33 participants (10 women) and 9 Refresher Workshops for 277 District Trainers and Farmer Trainers (70 women)
- National Workshop GO-NGO Collaboration for Pesticide Risk Reduction involving 56 participants (12 women)
- Assistance for two students from Royal University of Agriculture, Phnom Penh to write theses for completion of their Bachelor Degrees

The MAFF's National Plant Protection and Phytosanitary Inspection Office (PPPIO) promotes "safe and responsible use" and "pesticides as a last resort" to encourage farmers to use alternative crop protection strategies. It has prepared technical documents relating to effective and safe protection of crops, established a pest assessment and forecasting system as a preventive measure and is developing a pesticide and crop diagnosis laboratory for the purpose of pesticide analysis and pest identification. PPPIO received World Bank assistance for the establishment of laboratory facilities for pesticide quality control and pesticide residue analysis and for capacity building for laboratory technicians.

In addition to MAFF, the Ministry of Health also works on pesticides in relation to food safety and health. Field testing kits from Thailand have been used to carry out limited testing for pesticide residues in food. However, there are as of yet no facilities for testing residues in drinking water. The Ministry of Environment works on pesticides in relation to the environment. They have carried out research and published a preliminary inventory of POP pesticides in late 2004. They are developing plans to help prevent run-off of agricultural pesticides into waterways and to more effectively manage pesticide stockpiles.

Many CSOs and donor organizations such as CEDAC, Srer Khmer, NGO Forum and GTZ have also been working towards ensuring effective implementation of ecological-based agriculture and establishment of the Pesticide Reduction Network to develop awareness amongst farmers and the general public of the risks associated with pesticide use. The NGO CEDAC, for example, carries out research on pesticides and health impacts. A survey conducted by CEDAC in 2009 showed 175 common names and 811 trade names of pesticides available of which 93% were labeled in Thai, Vietnamese, Chinese and English languages. WHO Class 1 pesticides such as methomyl, methyl parathion, monocrotophos, methamidophos, mevinphos, dichlorvos, carbofuran, dicrotophos, omethoate, parathion and zinc phosphide were found in the market. Farmers who were interviewed reported often experiencing symptoms of mild poisoning such headache, dizziness, weakness and

nausea. Farmers reported that they could not read and understand instructions on use and safety precautions on labels and rely on the advice of pesticide shop retailers and sellers. CEDAC also produces materials and implements awareness campaigns and education programmes for farmers about the hazards of pesticide misuse as well as the benefits of organic agriculture.[3] Some CSOs have also formed the Network of Eco-agriculture Development in Cambodia to provide training in organic farming of rice and a production and marketing scheme. Since 2008, NGO Srer Khmer has been working with 4,000 farmers from Kampong Thom and Kampong Cham provinces. These farmers from 120 communities have been trained on how to grow organic cashew nuts, established their Internal Control System and now export certified organic cashew nuts to Singapore.

1.2.4 Current Opportunities, Challenges and Priorities

A network of IPM trainers and farmers is available for implementing, promoting and providing IPM and pesticide risk reduction training and related services. However, the number of qualified trainers associated with the programme and committed to providing high quality IPM training services to farming communities is decreasing as they move to work with NGOs who are able to give them more incentives. Priority will be given to improving the selection of committed and qualified trainers with high technical knowledge and facilitation skills who will support farmers' groups in new initiatives and provide quality training services to farming communities.

The number of farmers who have received and practice IPM training makes up only a small proportion of Cambodia's farmers while there is an emerging requirement for more farmers to be trained as to meet a growing demand for safe food. The Cambodia National IPM Programme will continue to train farmers in IPM as to reduce their reliance on pesticides. The programme will focus on high pesticide use areas and development of new curricula modules to strengthen farmer training on pesticide risk reduction.

The potential offered by growing niche markets for high-value organic products needs to be explored. The development of farmers' groups that could spearhead efforts for the production of pesticide-free and organic products will be a priority. Related to this is the attention that will be given to collect information on certification services, inspection and study of marketing channels. Farmers' groups will be assisted to explore partnerships with both governmental and nongovernmental organizations with experience along these areas.

There is a broad recognition throughout government of the existence of health and environmental issues associated with current pesticide use practices. The National IPM Programme has demonstrated clear reductions in pesticide use (See Figures 1 and 2: Change of Pesticide Use (in liter/household per year), Battambang and Prey Veng) and shifts towards softer (bio-) pesticides amongst IPM farmers. Regulations (Sub-Decree and *Prakas*) have been issued as to promote the work of the National IPM Programme. A pesticide registration scheme has been established and implementation is underway. Cambodia participates in several ongoing or planned international programmes related to food safety capacity building and development of Good Agricultural Practice

[3] CEDAC works jointly with the Environmental Justice Foundation, an international nongovernmental organization in addressing issues related to environmental security and basic human rights. CEDAC and EJF use the media to create public awareness and achieve change towards solutions to local problems. One of their joint publications, Death in Small Doses, tackles the problems and solutions to pesticide use in Cambodia. (see http://www.ejFoundation.org)

(GAP) standards. On the other hand, pesticide companies are still freely able to promote and distribute their products while government regulatory bodies are not capacitated to enforce laws. Strengthening pesticide regulations and their enforcement will be addressed by the *Policy Component* of the FAO Pesticide Risk Reduction programme. A pesticide dealer training, licensing and inspection system is currently implemented by DAL as part of this FAO support. FAO support for drafting of a law on pesticides and agricultural inputs will also continue as opportunities to do so arise. The *IPM Component* of the FAO Pesticide Risk Reduction Programme will collect data on actual health and environmental effects of current pesticide use practices as well as improper storage and disposal of empty pesticide containers that pose considerable risks to the environment and human health. The information will be used as inputs to the development of policies to support pesticide risk reduction.

The partnership between counterparts from governmental and nongovernmental organizations and farmers has to be strengthened. Links with research institutions to support efforts to broaden agricultural research into ecological alternatives to hazardous pesticides, and to improve access to softer inputs such as biological control agents and pest resistant varieties will be a priority. Agricultural universities and schools will be encouraged to play a more significant role in studying the health and environmental impact of pesticides, development of IPM techniques, and research into botanical and biological control. Collaboration with NGOs in raising awareness on risks associated with pesticide use and the promotion of IPM and organic agriculture will also be strengthened.

The framework for decentralization and de-concentration (D&D) stipulates the Royal Government of Cambodia's commitment to the creation of a sub-national governance system that is based on participatory principles, operates in a transparent and accountable manner, promotes local development, and delivers public services focused on meeting the needs of the people and the alleviation of poverty in their jurisdiction. Under this framework, commune councils (*sangkhats*) are expected to play an increased role in planning, financing and implementing local development programmes and delivering basic public services. Several international development partners (e.g., CIDA, DANIDA, DFID, NZAid, UNDP, IFAD and ADB) are now supporting this D&D process and empowerment of commune councils. Appropriation of funds from donors is based on activities identified by farmers that are incorporated into annual commune plans. The Pesticide Risk Reduction Programme will strengthen linkages with existing district and farmer IPM Trainers who are committed and empowered to participate in the preparation of the commune plan to ensure that IPM and Pesticide Risk Reduction Community Action Plans are incorporated in the agenda of the commune councils. In addition, to support the Cambodian government's thrust towards D&D, the Pesticide Risk Reduction Programme will step-up awareness-raising for government decision makers, sub-national officials, farmers and the general public regarding the risks of pesticides through media campaigns. Awareness of pesticide risks is a step towards improving the health and general welfare of community members which is a priority concern of Commune Councils. Efforts to educate farmers on ecologically-sound crop production will have to continue to contend with the strong pressure from agro-chemical companies sometimes unknowingly supported by government officials and institutions. However, efforts will be pursued to solicit support, both policies, political as well as financial, for farmers to continue to carry out IPM and pesticide risk reduction activities on their own. Priority will be given to identifying strategies and designing activities for national counterparts to be able to provide stronger technical backstopping to local pesticide risk reduction programmes.

2. Project Design for Pesticide Risk Reduction Programme during 2010-2013

2.1 Objectives and Logical Framework

Overall development objective:

Increased capacity of the National IPM Programme to implement farmer training on pesticide risk reduction (including IPM) and promote novel options for pest management and sustainable agricultural practices for production and marketing of healthy and safe food.

Adapted outputs and activities in relation to this overall development objective are contained in the logical framework in *Appendix 1*.

2.2 Priorities and Implementation Strategy

Under the Government's D&D framework, DANIDA provides direct support to communes for implementing activities for natural resources and environmental management. Backstopping to the implementation of the process is facilitated by national, provincial and district governments. At the local level, a commune council sets up annual Commune Investment Programmes (CIP) and workplans based on farmers' needs. This determines the priority development activities in the commune including farmer training and the funding available from NGOs, Government Institutions as well as commune fund for implementing these. The Pesticide Risk Reduction Programme will strengthen the capacity of existing district and farmer IPM Trainers who are committed to work with the programme and encourage them to participate in the preparation of the commune plan to ensure that IPM and pesticide risk reduction activities are incorporated in the agenda of the commune council. The National IPM Programme working in close cooperation with provincial departments of agriculture and other governmental and non-governmental organizations will continue to provide training and technical support to DTs and FTs in the implementation of IPM and local Pesticide Risk Reduction Community Action Plans. IPM Provincial Coordinators and IPM Trainers will provide assistance to communities in the development of action plans as well as in backstopping and monitoring to ensure that activities are implemented as planned.

A baseline survey will be conducted to update pesticide use statistics, identify crops and practices that will be targeted for improvement and for identification of communes and villages where the use of chemical pesticides poses high risks to humans and the environment. The study information will be used to prioritize areas where community education programmes on pesticide risk reduction will be established. The survey will also document the root causes of pesticide abuse in rural communities as well as current pesticide risks and exposure pathways. Based on these findings training materials including field school curricula, ecological guides, training manuals and field guide exercises will be updated and developed to capture the pesticide risk reduction strategies before being implemented within the training programme. The local partner CSOs CEDAC, ATSA and Srer Khmer will continue to carry out advocacy and policy development to strengthen the pesticide risk reduction programme. The added value of government and CSOs working together in pilot convergence areas on awareness raising, training and advocacy for various stakeholders in communities will be demonstrated.

Selected farmers will be provided an opportunity to participate in FFS and subsequent post-FFS training to identify groups with the potential to develop into farmer groups or associations where

they can continue activities such as field studies, marketing and other income generating activities. The Programme will focus interventions in 9 provinces (Siem Reap, Battambang, Kampong Cham, Kandal, Kampong Chnang, Kampot, Prey Veng, Svay Rieng, and Takeo) The tentative selection of these provinces was based on earlier surveys describing major pest problems and indiscriminate pesticide use in vegetables, mungbean and rice crops. Prey Veng, Svay Rieng, Kampot and Takeo Provinces were selected based on rice production areas and the substantial risk of pesticide overuse related to the current Brown Plant Hopper problems.

The Programme will work toward producing committed and qualified trainers with high technical knowledge and facilitation skills who are able to provide high quality training services to the farming communities. The Programme will regularly update government officials and conduct regular evaluation meetings and refresher courses for PC, DT and FT to review seasonal activities and identify the strengths, weaknesses and solutions for continued improvement of the programme.

The Programme will provide support for scaling-up the use of alternative pest management approaches that reduces reliance on chemical pesticides. This implies the needs to strengthen linkages with agricultural researches on ecological alternatives to hazardous pesticides, and to improve farmers' knowledge on environmental-friendly pest management and access to softer inputs such as biological control agents and pest resistant varieties. The emphasis will be on expansion of the National IPM Program with a focus on high pesticide use areas and developing the capacity of farming communities in these areas to produce safer food primarily for domestic consumer markets. The priority crops covered during this period will include those prone to high pesticide abuse such as: vegetables including cauliflower, Chinese kale, Chinese cabbage, yard long bean, cucumbers, tomato as well as rice, mungbean and fruit crops (with additional trust funds provided under FAO project GCP/RAS/268/AIT).

The Programme will strengthen international collaboration to align pesticide regulations with international requirements and measures taken in neighboring countries. In collaboration with Srer Khmer, CEDAC and other NGOS under the advocacy component of the project, activities – such as media campaigns - will be undertaken to support awareness raising, health and environmental education of farmers and the general public on pesticide risks.

2.3 Monitoring and Evaluation and Impact Assessment

2.3.1 Monitoring and Evaluation

All Programme activities will be closely monitored and evaluated by national and international experts to ensure that they are properly and effectively implemented to the highest standard. At the local level, the Provincial Coordinators and Team Leaders will regularly visit fields to monitor and evaluate the activities and provide feedback for improvement. The National Team will also undertake regular backstopping visits to field activities to provide methodological and technical advice to field trainers to improve the quality of activities.

IPM trainers in each province will continue to meet periodically to discuss and share lessons learned and find ways for better implementation of the activities. Seasonal evaluation and planning meetings will be held at the end of the season to review the implemented activities, highlight strengths and improve weaknesses as well as make plans for future activities.

Guidelines for M&E activities will be developed and used as tool by all involved people.

Participatory M&E will involve all concerned stakeholders during the implementation and at the end of each activity.

2.3.2. Impact Assessment Strategies

A follow-up study to the earlier impact assessment carried out in selected target provinces will be done. The scope of the study will cover direct and indirect impact as well as short and long term impact. The achievements, progress and improvement based on the same set of indicators before and after the Programme intervention will be compared. The impact assessment study will be implemented by an *external* institution to address the issue of credibility of impact assessment findings.

2.4 Local Partnerships

The Programme will work in close partnership with governmental institutions such as Department of Plant Protection Sanitary and Phytosanitary (DPPSP), the Department of Agricultural Legislation (DAL, BAMS), the Provincial Departments of Agriculture (PDA) in target provinces and NGOs such as Srer Khmer, CEDAC, ATSA and NGO-forum. Although the work of these collaborating organizations overlap to some extent, the project will identify the key areas for partnership based on the institution's expertise, as follows:

- *Department of Agricultural Legislation:* work in the area of pesticide legislation, regulation and reinforcement;
- *Department of Plant Protection Sanitary and Phytosanitary:* work in the area of pesticide risk reduction training, plant protection, including prevention and management of invasive pests and diseases, and pesticide residue testing;
- *Provincial Departments of Agriculture in target provinces*: provide staff and implementation arrangement for the operation of the field training and action research interventions;
- *Local Commune Councils (Sangkhats)*: have the functional responsibility for public service delivery, development management, and financial resources for implementation of Pesticide Risk Reduction Community Action Plans;
- *Srer Khmer:* work in areas of participatory action research, organizing farmers' associations, farmer education on ecological-based approaches;
- *CEDAC*: work in the areas of ecological agriculture, pesticide advocacy, awareness of pesticide risks;
- *ATSA*: work in the area of agriculture technology services based on IPM/FFS approach and provide training as well as qualified resource persons on a wide range of subjects, including pesticide impact assessment and agro-biodiversity.

2.5 Coordination and Management

The National Team consists of a part-time National Coordinator, one Project Coordinator, and three Training Officers. At the provincial level, the Training Team is comprised of a Provincial Coordinator, District Trainers and Farmer Trainers.

The National Team will be primarily responsible for (1) setting standards such as for training quality and budgets for field activities (2) Promoting innovations in curriculum development and developing and updating training materials including technical documents, field guides and curricula, (3) organizing TOT, refresher courses, coordination meetings and workshops and (4) providing technical backstopping to provincial trainers in implementing activities at provincial level and conducting monitoring and evaluation and impact assessments.

The Provincial Team will be responsible for conducting field activities including running or providing support to FFS, post-FFS activities, IPM Farmers' Clubs and Associations, M&E, trainers' meetings, seasonal evaluation and planning workshops and Farmer Congresses.

The Programme will set up an activity as well as a financial reporting system that the provincial teams can utilize. Initially, the Programme will prepare the overall seasonal workplan and budget allocation for each target province. This will be based on the workplan developed by the provincial training teams in consultation with the National Team. The Programme will transfer the requested funds to the provinces so they may implement activities. Under the Pesticide Risk Reduction Programme, a model of a self-revolving training fund for follow-up activities by FFS groups working toward pesticide risk reduction as a precondition for linking up with accreditation programmes (e.g., GAP) will be continuously explored.

The Programme will organize a coordination meeting every season with all PCs and representatives from partner organizations to discuss the progress of the activities and share experiences and address any issues or concerns encountered during the project implementation.

2.6. Indicative Training Budget

Indicative Training Budget

Activities	2010	2011	2012	2013	Total
Coordination meetings	800	800	800		2,400
Refresher and technical training for DT and FT	10,500	5,000	5,000		20,500
Leaflet, technical book production and Ecological Guide		600	600		1,200
Training for group leader of Farmer Associations		5,000	5,000		10,000
Meeting with DT and FT	1,000	2,000	2,000	1,000	6,000
Provincial seasonal evaluation meeting in every province (One Day in 2011, 2012 and 2013)	2,400	2,400	2,400		7,200
Link IPM-PRR farmers' groups with organizations with existing marketing networks/shops for selling pesticide-free vegetables in collaboration with local CSOs		1,500	1,500		3,000
Implement pilot activities such as biological control, other alternative methods to demonstrate beneficial role of IPM-FFS in government programme on safe vegetables and GAP		3,000	3,000		6,000
Farmer Field Schools on Vegetables and Mungbean: Total: 94 (2010=30; 2011=30; 2012=24; 2013=10)	21,700	21,000	16,800	7,000	66,500
Farmer Field Schools on Rice. Total: 39 (2010=12; 2011=12; 2012=10; 2013=5)	9,000	8,800	7,400	3,600	28,800
Provincial farmer field day	4,000	3,000	3,000	1,500	11,500

Activities	2010	2011	2012	2013	Total
Commune Workshop/short training on Pesticide Risk Reduction/Farmer congress in collaboration with local CSOs	600	2,000	2,000	1,000	5,600
Second FFS Season (Post-FFS)					
Post-FFS on Vegetable: Total: 62 (2010=12; 2011=20; 2012=20; 2013=10)	3,900	12,800	9,600	3,200	29,500
Post-FFS on Rice. Total: 30 (2010=7; 2011=8; 2012=10; 2013=5)	2,200	4,900	3,900	1,700	12,700
Action researches involving agricultural universities and private sectors in developing IPM		2,000	2,000		4,000
Farmer Associations, Rice and Vegetable Farmers	5,000	6,400	6,400		17,800
Provide technical support Existing Farmers Club	3,700	4,500	5,500	5,000	18,700
Case studies on success stories of IPM-PRR farmers		180	180		360
PC, DT, FT participate in the preparation of annual commune plans		1,000	1,000		2,000
Total	**64,800**	**86,880**	**78,080**	**24,000**	**253,760**

Appendix 1: Tentative Logframe

	Immediate Objective **Increased capacity of the National IPM Programme to implement farmer training on pesticide risk reduction (including IPM) and promote novel options for pest management and sustainable agricultural practices for production and marketing of healthy and safe food**				
	Outputs	**(Indicative) Activities**	**Indicators**	**Sources of Verification**	**Assumptions**
1	Functional networks of programme partners established as to ensure planning and implementation of more relevant and effective IPM and PRR training programmes	• Establish new - and strengthen existing- functional linkages with research institutions, private enterprises, traders and agricultural suppliers, and non government organizations • Hold regular meetings among project partners (including CEDAC and ATSA) at local and national levels (e.g. coordination meetings, seasonal planning and evaluation meetings, feedback sessions after technical backstopping visits, etc.) • Conduct baseline surveys and develop/update country strategy paper to prioritize curriculum development and training interventions • Develop a three-year work plan on research and training needs, integrating monitoring and evaluation activities with a focus on pesticide risk reduction	• Regular communication meetings/networking among a diversified set of project partners on local and national level • Baseline survey reports • Research and training activities with a focus on pesticide risk reduction implemented per work plan	Meeting notes/reports published Updated country strategy paper Curriculum for new crops	Governments, CSO partners and private sector commit to joint sharing of experiences and programme planning.
2	Fortified FFS, TOT and Refresher Training curricula and training materials developed with focus on pesticide risk reduction, including IPM for new invasive pest/diseases, crops and climate change adaptation	• Continue to update the curriculum for farmer training on Pesticide Risk Reduction • Undertake action research activities involving agricultural universities and private sector in developing IPM for new crops subject to heavy pesticide abuse • Action research and curriculum development focusing on development of local risk mitigation/adaptation strategies to prepare communities for prevention and management of newly emerging pest/disease problems related to climate change.	• Availability and implementation of fortified/adjusted curriculum and training models • Diversity and quality of training materials (field guide exercises, bulletins, technical documents, others) available and utilized	Progress reports including list of training curriculum and materials developed Training materials (including ecological guides for new crops, e.g. fruits and curriculum guidelines for climate change FFS) available in English and various local languages, and distributed to local trainers and farmers	As climate warming will bring about marked changes in agricultural pest distribution patterns, national governments would be tasked to assist rural communities to adapt and manage these new problems with minimal use of pesticides.
3	Capacity of national and private sector programmes to train farmers in IPM and pesticide risk reduction strengthened and	• Conduct 4 Refresher Courses integrating new modules on IPM and pesticide risk reduction, including risk mitigation/adaptation strategies for dealing with new pest/disease resulting from climate change.	• Number of trainers with enhanced capacity to train farmers	Progress reports including list courses conducted and number of participants trained in ToTs and Refresher Courses	Governments will make available staff for participation in training and will

	Immediate Objective **Increased capacity of the National IPM Programme to implement farmer training on pesticide risk reduction (including IPM) and promote novel options for pest management and sustainable agricultural practices for production and marketing of healthy and safe food**				
	Outputs	**(Indicative) Activities**	**Indicators**	**Sources of Verification**	**Assumptions**
	increased	• Coordinate and arrange local and, if appropriate, overseas training courses on specific issues			allow their staff to implement farmer training thereafter.
4	At least 3,200 additional farmers participated in FFS and post-FFS Pesticide Risk Reduction farmer training and at least 50% of trained farmers involved in community learning activities and implementation of community action plans for pesticide risk reduction. At least 1,000 additional farmers will have *indirectly* benefited from FAO technical support for the National IPM Programme through participation in FFS and post-FFS activities supported under the FAO-IFAD supported project on *Enhancing Competitiveness of Smallholder Farmers*, SRI project and other local IPM-PRR funded initiatives.	• Conduct 133 IPM-PRR Farmer Field Schools • Commune workshops and community mobilization and formulation of about 250 community action plans for pesticide risk reduction involving local CSOs • Facilitate 130 IPM-PRR post-FFS community learning activities (biocontrol testing, disease management, marketing, etc) and exchanges in Farmers' Congresses • Start up 80 IPM Farmers' Clubs/Associations and self-help groups and farmer networks involving local CSOs	• Level of use of alternative pest management among farmers trained • Community actions taken for pesticide risk reduction • Reports on farmer field studies conducted	Surveys showing: - a reduction of Class I by at least 40% among FFS trained farmers. - IPM\FFS trained farmers at least halved pesticide use. - at least 90% of trained farmers increase use of alternative pest management approaches, including soft products) Documentation on Community Action Plans for Pesticide Risk Reduction Progress reports including list of farmer field studies and research conducted, Farmers' Clubs/Association by-laws adopted	
5	Internal monitoring and evaluation system for training quality control using quality standards for PRR-fortified IPM-FFS training developed	• Consolidate and implement participatory monitoring and evaluation system for IPM-FFS/Pesticide Risk Reduction training programmes • Conduct national training and workshops on monitoring and evaluation system • Regular backstopping visits by National Team and provincial IPM trainers and follow up on implementation of	• Information on activity implementation is continuously available and used for strengthening quality of field training • Status of implementation of standards assessed. • Quality standards for FFS and TOT issued by relevant national and private sector authorities • Monitoring reports	Study material produced and reports documenting Community Pesticide Risk Reduction Action Plans. Assessments Studies of standards	

	Immediate Objective **Increased capacity of the National IPM Programme to implement farmer training on pesticide risk reduction (including IPM) and promote novel options for pest management and sustainable agricultural practices for production and marketing of healthy and safe food**				
	Outputs	**(Indicative) Activities**	**Indicators**	**Sources of Verification**	**Assumptions**
		Community Action Plans for pesticide risk reduction			
6	National and local government providing policy and funding support for IPM and Pesticide Risk Reduction training	• Implement pilot GO-CSO joint activities to demonstrate beneficial role of IPM-FFS in government programmes on safe vegetables and GAP • Design, conduct and document impact assessment study among IPM-FFS graduates, with particular focus on pesticide risk reduction • Experiment with model of a self-revolving training fund mechanism for follow-up activities by FFS groups • PC, DTs and FTs participate in the preparation of annual commune plans • Popularize the impacts of IPM-FFS and pesticide risk reduction training through publications and radio broadcasts	• Publications developed on IPM/PRR and disseminated • Impact Assessment studies on successful CEPRR models published and utilized to strengthen training interventions and used for generating local and national policy support • Government policies and action plans reflect need for pesticide risk reduction and recognize the positive impact of IPM-PRR FFS programmes • Amount of local funding available for farmer training and community education on pesticide risk reduction	National and local government/community plans and policies Impact assessment studies Contracts/Letters of Agreement with new partners issued for support along research, awareness raising, health and environmental education and advocacy work in support of pesticide risk reduction Publications and press releases	

Appendix 2: Tentative Workplan

Output	Activities	2010						2011												2012												2013					
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
1	Establish new- and strengthen existing-functional linkages	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	Hold regular meetings among project partner at local and national level		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Conduct baseline survey every target province before starting FFS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
	Develop three-year workplan	X	X	X	X																																
2	Update curriculum for farmer training on PRR			X	X	X	X																														
	Undertake action research activities							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3	Conduct refresher workshops including field implementors from local partner CSOs					X	X											X	X										X	X							
	Coordinate and arrange local and, if appropriate overseas training on specific issues	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	Conduct season long FFS on vegetable, rice and mungbean	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Output	Activities	2010						2011												2012												2013					
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
	Run Field Days			X	X					X	X					X	X					X	X				X	X				X	X	X			
	Conduct commune workshop involving local CSOs									X	X											X	X										X	X			
	Conduct post-FFS activities on vegetable and rice crop	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	Start up IPM Farmers' Club/Associations and self-help groups and farmer networks involving local CSOs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
5	Consolidate and implement participatory monitoring and evaluation system for IPM-FFS/PRR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	Conduct national training and workshop on monitoring and evaluation system											X	X																								
	Regular backstopping by National Team and Provincial IPM trainers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
6	Implement pilot GO-CSO joint activities to demonstrate beneficial role of IPM-FFS on government programme on safe vegetables and GAP							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Output	Activities	2010						2011												2012												2013					
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
	Design, conduct and document impact assessment																								X	X	X	X	X	X	X	X	X	X	X		
	PC, DTs and FTs participate in the preparation of annual commune plans		X	X	X	X									X	X	X	X									X	X	X	X							
	Popularize the impacts of IPM-FFS and pesticide risk reduction training through publications and radio broadcasts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X