



**Food and Agriculture Organization
of the United Nations**

REPORT

of

“CAPACITY BUILDING FOR SPREAD PREVENTION AND MANAGEMENT OF CASSAVA PINK MEALYBUG IN THE GREATER MEKONG SUBREGION”

(Regional Technical Cooperation Project TCP/RAS/3311)

INCEPTION WORKSHOP

**Bangkok, Thailand
31 May – 2 June 2011**

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC
Bangkok, July 2011**

Explanatory Note

Cassava is a major crop used for human consumption, animal feed and bioenergy production, with about 3 million smallholder farmers in the Greater Mekong Subregion (GMS) deriving their livelihoods from the crop. In 2008, the cassava pink mealybug (CM) invaded Thailand, resulting in extensive crop damage. To combat it, the parasitoid *Anagyrus lopezi* was introduced from Africa. Releases of the parasitoid, including other local predatory lacewings, together with IPM training efforts of field extension workers and farmers, have proved highly effective in dealing with the CM problem.

Adopting this strategy and in response to calls for support, FAO has formulated a regional TCP project entitling “*Capacity Building for Spread Prevention and Management of Cassava Pink Mealybug in the Greater Mekong Subregion*” to assist the GMS countries develop pest-spread prevention strategies and ecological biocontrol options to manage the CM. The project will provide technical assistance to sustainably intensify cassava production through effective management of the CM pest.

To launch the TCP project, an Inception Workshop was held from 31 May - 2 June, 2011 in Bangkok. The main objective is for participants to develop concrete and realistic work plans for follow-up implementation, not only in Thailand but also in other GMS countries which face potential threat from similar invasion, namely, Cambodia, China, Lao, Myanmar and Vietnam. To facilitate the work plan developing process, the workshop has included lecture presentations, field visit and working group sessions to generate discussions and to obtain the most up-to-date situations regarding the CM problem.

This report documents all the undertakings of the Inception Workshop. The report has two main parts, **Part A** and **Part B**.

- **Part A** contains the background information of the TCP project, programmes of the workshop and list of people attending, as well as the presentations that were delivered plus the key issues arising and their considerations. Also appended are the powerpoint presentations by the presenters.
- **Part B** contains primarily the project work plans and the working arrangements. These are categorized into two broad groups, namely (1) the regional and general work plans which involve the countries collectively and (2) the country-specific work plans which cater mainly to the individual country. The plans specify **what** the particular activities are, including **where, when, how, and who** will implement them.

Acknowledgements

Thanks are due to the collaborating institutions and many people who have contributed to the success of the Inception Workshop, in particular:

- All country participants from National IPM Programmes and partner Civil Society Organisations (CSOs) and representatives from regional CSOs for their presentations and active participation, cooperation and contributions in all the sessions,
- The Chonburi Pest Management Center of DoAE for hosting the study visit on 1 June,
- All resource persons for freely sharing their knowledge and experiences during the formal presentations and discussions with participants, and
- Staff of the FAO Regional Vegetable IPM Programme for organizing and making the workshop possible, including making available logistic and financial support to participants where needed.

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31 May – 2 June 2011

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Acronyms

AIT	Asian Institute of Technology (Thailand)
ACMV	African cassava mosaic virus
CATAS	China Academy of Tropical Agriculture Science
CCMV	Cassava common mosaic virus
CIAT	International Center for Tropical Agriculture
CIBC	Commonwealth Institute of Biological Control
CM	Cassava <u>mealybug</u> (<i>Phenacoccus manihoti</i>)
CSOs	Civil Society Organisations
DAFO	District Agriculture and Forestry Office
DoA	Department of Agriculture (Thailand)
DoAE	Department of Agriculture Extension (Thailand)
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer Field School
GIC	Guangxi Institute of Cassava
GIS	Geographical Information System
GMS	Greater Mekong Subregion
GPS	Global Positioning System
GXAAS	Guangxi Academy of Agricultural Science
IIBC	International Institute of Biological Control
IITA	International Institute of Tropical Agriculture
IPM	Integrated Pest Management
ISPM	International Standards for Phytosanitary Measures
KARI	Kenya Agriculture Research Institute
LIG	Lao Indochina Group
LTO	Lead Technical Officer
MAF	Ministry of Agriculture and Forestry
MARD	Ministry of Agriculture and Rural Development
MoAFF	Ministry of Agriculture, Forestry and Fisheries
NATESC	National Agro-tech Extension & Service Center
NAFRI	National Agriculture and Forestry Research Institute
NAFES	National Agriculture and Forestry Extension Service
NGO	Non-Governmental Organization
NIPP	National Institute of Plant Protection
NPC	National Programme Coordinator
NPPO	National Plant Protection Organisation
PMC	Pest Management Center
PMU	Project Management Unit
PPC	Plant Protection Center
PPD	Plant Protection Department
PPSD	Plant Protection Sub-Department
PSC	Project Steering Committee
PTAG	Project Technical Advisory Group
R&D	Research and Development
PQD	Plant Quarantine Division
RAP	Regional Office for Asia and the Pacific
TCP	Technical Cooperation Programme
ToT	Training of Trainers
TTDI	Thai Tapioca Development Institute
UN	United Nations

Executive Summary

The Inception Workshop, held from 31 May – 2 June, 2011 in Bangkok, was to launch the TCP project on “Capacity Building for Spread Prevention and Management of Cassava Pink Mealybug in the Greater Mekong Subregion”. Twenty-eight participants attended the workshop, comprising 15 representatives from the Governments and National IPM Programmes of GMS collaborating countries (Cambodia, China, Lao, Thailand and Vietnam); seven participants from selected national, regional and international organizations whose mandates also cover cassava-related activities; and six FAO staff and consultants.

*The main workshop activities included: (i) Presentations and discussions on various aspects of CM, its management with *A. lopezi* parasitoid, other cassava pests of potential threat in the region, as well as issues relating to natural enemy exploration and establishing GIS database system for CM, (ii) Field visit to cassava crops and DoAE Chonburi Pest Management Center to observe and learn about CM and mass rearing of *A. lopezi*, and (iii) Participants working in groups to brainstorm and develop their respective TCP project work plans.*

A total of eleven presentations were delivered: three from Thailand on work undertaken by DoA, DoAE and TTDI since CM incursion in 2008, including progress made and the future plans; four country reports on cassava cultivation and status of CM in each GMS participating country; and four from the international organisations, CIAT, CABI, AIT and FAO, covering broader aspects relating to potential pests/diseases of cassava, exploration of parasitoids for CM control, setting up a GIS database support of CM in the GMS, and an overview of the TCP project, including the expectations.

*In Thailand, the primary effort is to intensify mass rearing of *A. lopezi* for distribution to cassava farmers throughout the country. Efforts are also on-going to establish community plant pest management centers to undertake training, surveillance with GIS support, and information dissemination through various media. The activities are geared toward developing a national strategy for pest management. Among the other GMS partner countries, only Cambodia has officially confirmed the presence of CM. Efforts will primarily focus on preventing entry where the CM is absent, and where/when present, to introduce *A. lopezi* parasitoid for its control.*

Based on the presentations and plenary discussions thereof, as well as from side consultations pertaining to some specific topics, the follow-up actions to a number of key issues were suggested. Work plans of activities for implementation by the project, including the working arrangements, were also developed to enable those concerned to be clear on what the specific activities and targets are, the timeline to achieve them, and who will be responsible.

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PART A

[Included in this Part are background information of the TCP project, programmes of the workshop and list of people attending, as well as the presentations that were delivered plus the key issues arising and their considerations]

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A1. Introduction

In the Greater Mekong Subregion (GMS), cassava is a major crop used for human consumption, animal feed and bioenergy production, with about 3 million smallholder farmers deriving their livelihoods from cassava production. In 2008, incursion by the exotic cassava pink mealybug (CM), *Phenacoccus manihoti*, destroyed extensive cassava areas in Thailand. By 2010, it was also confirmed present in Cambodia in limited areas near the Thai border. To combat the CM, Thailand, with help from CIAT, has introduced from Africa the parasitoid *Anagyrus lopezi*. Releasing the parasitoid and local predatory lacewings, together with ecological pest management training efforts of field extension workers and farmers, has proved highly effective in dealing with the CM problem.

Adopting this strategy and in response to calls for support from its member countries, FAO has formulated a regional TCP project entitling “*Capacity Building for Spread Prevention and Management of Cassava Pink Mealybug in the Greater Mekong Subregion*” to assist the GMS countries develop pest-spread prevention strategies and ecological biocontrol options to manage the CM. The partner countries in the project include Cambodia, China, Lao, Myanmar, Thailand and Vietnam. The main thrusts of the assistance are aimed at introducing *A. lopezi* from Thailand to partner countries where the parasitoid is absent and to strengthen farmer training programmes to promote biocontrol and IPM of CM among the smallholder farmers. The expected project outcomes include fortification of the cassava production industry, improving the livelihoods of cassava farmers, protecting farm communities and the environment from pesticide contamination, and preserving the agro-biodiversity and human capital development. The project will provide technical assistance to sustainably intensify cassava production through effective management of the CM pest.

To launch the TCP project, an Inception Workshop was held in Bangkok from 31 May - 2 June, 2011. Guided by the strategies as outlined in the project document and the most up-to-date problem situation gained from feedback and discussions at the workshop, the participants developed concrete work plans for follow-up implementation in the partner countries. Giving due attention to the most current information is crucial as there has been significant lapse in time since project formulation. Whatever changes and new developments that may have taken place will therefore need to be taken into consideration to enable the preparation of realistic project work plans.

A2. Inception Workshop Programme and Participants

A total of 28 participants attended the workshop, comprising 15 representatives from the Governments and National IPM Programmes of the following GMS collaborating countries, Cambodia, China, Lao, Thailand and Vietnam; seven participants from selected national, regional and international organizations whose mandates also cover cassava-related research and development activities; and six FAO staff and consultants. Myanmar, a targeted GMS collaborating country, unfortunately could not process its participation in time and was absent. The list of participants, including their contact details, is as given in *Annex A1*.

The main activities of the workshop included lecture presentations, field visit and working group session, as outlined below.

- i. Presentations and discussions on various aspects of the CM, in particular experiences on its management with the parasitoid *A. lopezi*. Also considered were other pests of potential threat to cassava in the region and issues relating to natural enemy exploration and establishing GIS database system for CM,

- ii. Field visit to cassava crops and the DoAE Pest Management Center in Chonburi province to observe and learn about mass rearing of CM and *A. lopezi*, and
- iii. Participants forming different working groups to brainstorm and develop their respective country work plans of the TCP project.

The detailed workshop programmes on presentations and working sessions, field trip, timing of the specific activities and the people involved as chairpersons are as given in **Annex A2**.

A3. Opening Remarks

The Inception Workshop was officially opened with welcome remarks by Mr. Piao Yongfan, FAO-RAP Regional Plant Protection Officer, and concurrently the Lead Technical Officer (LTO) of the TCP project. He clarified that TCP budget is usually not huge, meant primarily to raise awareness of an urgent problem and to kindle collaborative actions by Governments in dealing with the problem. Despite its small budget, there have been successes with TCP projects, especially when there is earnest sharing of knowledge and experiences and of learning from outstanding case examples. Hence, for this case of CM, he urged the participants to take preventive measures by learning from the experience of Africa. He wished participants a fruitful workshop and encouraged them to freely exchange information and experiences on spread prevention and management of the CM so that this TCP project would be another successful case example.

A4. Presentations

A total of eleven presentations were delivered: three from Thailand on the work undertaken by DoA, DoAE and TTDI since the CM incursion in 2008, including the progress made and the future plans; four country reports on cassava cultivation and production and the status of CM in each nation from Cambodia, China, Lao and Vietnam; and four from the international research and development organisations, CIAT, CABI, AIT and FAO, covering broader aspects relating to key and potential pests/diseases of cassava, exploration of parasitoids for CM control, setting up a GIS database support of CM in the GMS, and an overview of the TCP project, including its background, contents, objectives and expectations. The summaries of these presentations are as outlined below with more details and graphics of each presentation given in **Annex A3**.

A4.1 Thailand

A4.1.1 Department of Agriculture. The presentation was delivered by Ms. Amporn Winotai who provided an update of the CM situation and the research undertaken in Thailand, including anticipated future plans. The CM was first found in Kamphaenphet in April 2008. Infesting about 48,000 ha initially, it quickly spread over 160,000 ha by April 2010. Since then, IPM strategies for its control were implemented. The cultural methods included soil preparation, removal of all infested plants and weeds away from the field, leaving the soil idle for at least two weeks, and using clean planting materials. If clean materials were unavailable, soaking them in insecticides was carried out. Chemicals to be used included Thiamethoxam 25%WG (4 gm), Thiamethoxam 35%FS (3 ml), Imidacloprid 70%WG (4 gm), Imidacloprid 60%FS (5 ml), Clothianidin 16%SG (30 gm), and Dinotefuran 10%WP (40 gm). To date, five species of mealybugs have been found on cassava in Thailand, namely: *Ferrisia virgate*, *Pseudococcus jackbeardsleyi*, *Phenacoccus madeirensis*, *Phenacoccus manihoti*, and an unidentified species (possibly *Paracoccus marginata*?).

In September 2009, 500 wasps of *Anagyrus* (*Apoanagyrus*, *Epidinocarsis*) *lopezi* were introduced from IITA-Benin and host specificity tests carried out on 14 insect species (6 beneficials and 8 pests). In December 2009, small field releases were made for evaluation at Rayong FCRC and TTDI in Korat. After official clearance, wide-area releases began in July 2010. The field releases have shown positive results, with the previously infested cassava plants quickly recovering and the CM populations declining to insignificance.

Presently, mass rearing of *A. lopezi* is being undertaken for distribution to more farmers. There is plan to establish a total of 30 mass-rearing units in different parts of the country, some of which are already in operations. On research, efforts are on-going to develop techniques for evaluating the impacts of the parasitoid; procedures sufficiently simple and usable by extension workers, and possibly also farmers. Other research plans include ecological studies on the CM and parasitoid.

A4.1.2 Department of Agriculture Extension. The presentation, delivered by Ms. Watchreeporn Orankanok, outlined the progress of activities undertaken in Thailand and the future plans of DoAE with respect to managing the CM. Initially, the CM spread rapidly into many provinces in Thailand. There was under-supply of cassava produce, with demand of 29 million tons (15 million tons for powder, 11 million tons for chips, 3 million tons for ethanol) versus supply of only 21 million tons. At one stage, approx. 8.2% (or 96,000 ha) of 1,168,000 ha planted was severely infested, with economic loss of about Baht 100 million. At peak infestations, the loss was even much more. However, with implementation of area-wide IPM measures, the CM infestations declined drastically; from 230,797 ha in 2009 to 161,671 ha in 2010, and currently only 43,665 ha in 2011.

The dramatic improvement achieved was a result of the evolving managing strategies being implemented over time to meet the changing situations of the CM. These may be viewed under three different scenarios; before, during and after the CM outbreak in an area. Before the outbreak, the focus was on monitoring and warning. For monitoring, field surveillance was established with weekly survey undertaken and warning given to farmers when an outbreak was imminent. The warning may be given at community level through local mass media or reported to the local DoAE office. During an outbreak, the emphasis was shifted to area-wide implementation of IPM strategies to prevent, contain and to suppress the CM. The measures undertaken included: using tolerant/recommended variety, using clean seed stock from non-infested area or otherwise treating with recommended chemicals, plowing a field to sun-dry for 14 days, maintaining good planting practices, conducting weekly crop inspection to remove mealybugs when its population was low, and to release natural enemies. After the outbreak, DoAE continued actively with extension activities to update and to educate farmers on any new development and management concerning CM. Effort was also made to establish community plant pest management centers that would undertake training, surveillance with GIS support, and dissemination of information through various media (TV, radio, newspapers, leaflets, posters, display set, text messages through H/P, etc). The diverse activities were geared toward developing a national strategy for pest management.

A4.1.3 Thai Tapioca Development Institute. In his presentation, Mr. Adul Vinaiphath first showed a video to introduce to the participants the setup of TTDI, its purpose and the work being undertaken. Its primary aim is to support the farmers and the Thai tapioca industry through R&D. Over time TTDI has provided farmers with improved varieties and developed better farming practices through mechanisation to help farmers reduce labour costs and has explored foreign markets for the local tapioca industry.

Following the video, Mr. Vinaiphath outlined the efforts made by TTDI on mass rearing of the parasitoid *A. lopezi*, its distribution to farmers and releases by them for the control of CM. It began in January 2010 with TTDI receiving 100 pairs of the parasitoid for multiplication at TTDI in Huay Bong. Rearing facilities were constructed, while pilot release of parasitoids

within TTDI farms carried out. By May, releases of *A. lopezi* had covered 4,300 ha. With clearance from DoA, TTDI in July started to distribute parasitoids to farmers with infested cassava farms. And in September 2010, the first training on parasitoid mass rearing was conducted for 350 agriculture extension officers at Huay Bong.

At TTDI, it was possible to mass produce large numbers of parasitoids for releases in the fields of farmers. A total of 392,699 pairs were reared in 2010 and 1,047,520 pairs in 2011. And the number of pairs released over the different regions of the country were respectively, 856,790 (northeast), 148,680 (west), 49,650 (central), 47,400 (east), and 87,700 (north). This was made possible because of the huge and excellent insectaries constructed for mass rearing of *A. lopezi* at Huay Bong. Other factors contributing to the successes achieved were the close working arrangements among TTDI, DoA, DoAE and the good cooperation of the Huay Bong's farmers who were involved in the pilot project. Presently, and in the future, the rearing efforts will continue and be intensified with the aim to provide parasitoids to as many cassava farmers as possible throughout the country.

A4.2 Other GMS Countries

A4.2.1 Cambodia. In his presentation, Mr. Heng Chhun Hy reported that cassava in Cambodia is largely grown in upland areas in the west, central and south-eastern parts of the country, mainly in the provinces of Banteay Meanchey, Battambang, Pai Lin, Kampong Cham, Kampong Thom, Kratie and Svay Rieng. The varieties that are commonly grown are from Thailand, e.g. Rayong 50, Rayong 60, Kasetsat 80, Kasetsat 81 and Boyboong. Some farmers also plant varieties from Vietnam. Over the years, cassava production in Cambodia has increased significantly, from only 16,279 ha in 2000 to 158,641ha in 2009. On average, the cassava farm size is 2-5 ha per household, although some farmers have large fields of 60-100 ha. Production yield varies from 20-40 tons/ha, averaging 22 tons/ha. Fresh cassava price may vary from 200-400 Riel/kg, although farmers near the Vietnam border can usually receive higher prices than those selling to a Thai company (at 200-300 Riel/kg).

Reports from the Agronomy Office have to date confirmed some cassava fields in the provinces near the Thai border (Banteay Meanchey, Battambang and Pai Lin) to be infested by CM. On 11 June 2010, the General Directorate of Agriculture reported 8,382 ha infested in Banteay Meanchey of which 137 ha were seriously damaged. Due to the infestations, farmers have estimated the yields would decline to only about 5 tons/ha.

The following are activities which require priority attention and it is hoped that they will be strongly supported by the Government and private sector to improve cassava production and extension services in the country.

- Seeking assistance and to collaborate closely with international agencies/experts to manage the CM pest.
- Undertake mealybug surveillance in cassava production areas.
- Prevent movements of cassava varieties from infested areas for use in un-infested areas.
- Undertake experimental studies to develop ways to manage the CM.
- Raise awareness of CM infestations in stakeholders.
- Conduct ToT for agriculture technicians to train farmers in FFS to control the CM.
- Participate in information sharing networking on CM situation in the region.
- Multiply and release natural enemy agents to help control the CM, including the importing of known effective parasitoid species.
- Seek financial support from the Government and NGOs to support the aforesaid activities.

A4.2.2 China. The country report given by Mr. Zhu Xiaoming highlighted that the total area planted to cassava in China in 2005 was 251,000 ha, amounting to 1.4% of total cassava area worldwide and ranking 16th in terms of cassava production. Production of cassava root was 4.2 million tons (2.1% of the world's total) with average yield of 16.8 ton/ha. Import data of cassava (for processing and starch) in 2003 was 3.4 million tons estimated at USD 198 million while export was 119,000 tons at USD 38 million. About 80% of cassava growing region in China are located in Hainan, southern Guangxi, Guangdong, Yunnan and Taiwan. The total area has increased from 94,000 ha in 1961 to 970,000 ha in 2009.

In China, cassava stems are used as substrate material for mushroom production, fertilizer, fuel and as raw material for the lumber industry. Tuberos roots and leaves are used for animal feed (30%) and as industrial material to produce starch and ethanol (70%), including snack foods.

The crop is sown in March-April and harvested in November-December, with plastic mulch used at the sowing stage. Cassava is grown both as a monoculture and for greater benefits as intercrop with others, such as soybean, corn, peanut, melon, pumpkin, white gourd, sisal, juvenile fruit and mushroom.

The insect pests of cassava in China include: Carmine spider mite (*Tetranychus cinnabarinus*), click beetles (*Pleonomus canaeiculatus* and *Agriotes fuscicollis*), boll weevil, thrips, whitefly, and aphids. The mealybug species, *P. manihoti*, has not been observed or reported so far. In Guangxi, Guangdong, Hainan and Taiwan, infection by bacterial blight disease (*Xanthomonas axonopodis* pv. *manihotis*) from early June to August can result in about 50% loss of yield. In Guangxi and Hainan, infection by bacterial angular leaf spot disease (*Pseudomonas syringae* pv. *lachrymans*) during May to September has caused about 25% yield loss. Other diseases include bacterial brown angular leaf spot disease (*Xanthomonas campestris* pv. *malvacearum*), cassava anthracnose disease (*Glomerella cingulata*), viral diseases transmitted by whitefly, cassava common mosaic virus (CCMV) and African cassava mosaic virus (ACMV).

Damage by insect pests in cassava is generally not serious and farmers usually do not take any control measures. At county level, a few County Plant Protection Stations in main cassava growing areas do carry out field monitoring of spider mites. Several institutes in universities/academes carry out research on cassava variety breeding, cultivation technology, cassava processing and pest control. These institutions include Guangxi Academy of Agricultural Science (GXAAS), Guangxi Institute of Cassava (GIC) and China Academy of Tropical Agriculture Science (CATAS).

A4.2.3 Lao. In his presentation, Mr. Phoukaothong Sikaisone stated that the Lao Ministry of Agriculture and forestry, Ministry of Industry and Commerce is in charge of formulating national cassava policies. This is done in cooperation with other government agencies and non-profit private organizations for investment in the country. Cassava is becoming an economically important crop for smallholder farmers in Lao, not only in providing poor farmers with food, feed, and income, but also acts as catalyst that can transform subsistence farming into income-generating farming, allowing smallholder farmers to join the market economy.

After rice and maize, cassava is presently the third most important crop in the Lao. The price of raw cassava to farmers is USD 30-35 per ton. In 2006-07, Lao exported about 5,269 tons of cassava to China and Vietnam, and this has increased to about 6,630 tons in 2007-08.

Cassava cultivation and production is increasing rapidly in Lao with plantations tripling over the last few years. There are now two processing plants in Lao; one near Vientiane and the other in Saravan province. The bank also helps in financing farmers in Khamkeuth district

(Borikhamxay province), Hom and Xaysomboun districts (in Vientiane province), and Sangthong and Pakngum districts in Vientiane, to grow cassava to supply processing plants nationwide. In Vientiane province, the cassava processing plant had begun production a couple of years ago and has the capacity to produce 200 tons of cassava powder per day, primarily for export to Vietnam. The Lao Indochina Group (LIG) plant in Vientiane produces 150 tons of powder a day, with 80% of its output shipped to China.

The occurrence of CM cannot be confirmed presently because field surveys have yet to be conducted. In the meantime, intensive plant quarantine checks will be imposed on cassava planting materials before importation and farmers will be advised to use clean planting materials. Should CM be detected subsequently, all infested plants and weeds in the field would be removed and field monitoring will be conducted for detection and control of the pest. Capacity building of Lao Government staff to undertake these activities is desirable, while assistance needed from international experts to develop and implement a mealybug surveillance system. Information exchange with other countries on issues relating the CM ought to be initiated.

A4.2.4 Vietnam. Mr. Ngo Tien Dung in his delivery informed that KM94 is a popular cassava variety in Vietnam. In the North (Hoa Binh, Nghe An, Phu Tho and Son La provinces) cassava is generally planted as monoculture in ridges (on slopes) and poor soils lacking in nutrients. In Southern Central Coastal Region and Southern Region (Binh Thuan, Ninh Thuan, Tay Ninh, Gia Lai, Kon Tum, Dac Lac and Dong Nai provinces) cassava is grown in flat areas and generally as an intercrop with maize, groundnut, black bean, mungbean, cashew nut, fruit trees or vegetables. The cassava area may be as high as 70–90% of the total planted area.

The time of planting is dependent on local climatic conditions and the cropping patterns. In the North, only one crop is cultivated per year. Provinces in North Mountainous Region and Red River Delta grow cassava from February to March when soil moisture increases due to spring rains. In South Central Coastal Region, planting usually starts in January. Provinces in the South Region can grow two crops, with the main season (70% in area) starting in April-May and harvesting from January-March of the following year. The minor crop (30% in area) begins in mid-August to September and lasting until next mid-September to October.

The following diseases and insect pests have been reported, with severe yield reduction quite rare. Only red spider mites, thrips, whitefly, termites and stem borer are reported to damage cassava plants but the affected damage area is limited and farmers never need to use chemical pesticides to control them. The CM, *P. manihoti*, is yet to be confirmed present, although other cassava mealybug species have been recorded. Among pathogens, 19 diseases caused by them have been reported on cassava in Vietnam. The principal ones are bacterial blight (caused by *Xanthomonas manihotis*), Cercospora leaf spot (caused by *Cercospora sp.*) and ‘witches broom’ (caused by Phytoplasma). High incidence of Phytoplasma has been reported in some provinces from 2007-2009 with yield losses estimated at 20-30%. Presently, no good control measures are available except the use of clean planting material and resistant varieties.

A4.3 International Organisations

A4.3.1 International Center for Tropical Agriculture (CIAT). In transmitting the subject of managing cassava pests and diseases, Mr. Antony Bellotti first presented the very important ones which are of vital concern and the potential yield losses they can inflict. Factors that will influence their severity and abundance were described, e.g. industrialization, increasing size of cultivation, etc. For control, focus should be on preventive and curative measures (IPM, host plant resistance, biological control, cultural practices and quarantine). It is important to avoid programmed applications or “calendar pesticide applications”. Where

necessary, the corrective measures to be employed could include treating planting materials with chemicals and applications in hot spots.

The world distribution of the major pests and diseases were defined and an overview of the biological control of CM with *A. lopezi* was elaborated. It was pointed out that *A. lopezi* is a highly effective parasitoid and has established itself in wide range of ecological zones covering an area of 2.7 million sq km over 27 countries. Cassava losses can be reduced by 90-95% with an estimated savings of USD 7.97-20.23 billion. Where *A. lopezi* has been released, the loss was generally only 5-10%. Such impacts were well illustrated by case examples in Africa, Brazil and Thailand.

Currently there are a number of mealybugs attacking cassava. However, these also have abundance of parasitoids that may be used against them. The recommended strategies for IPM of cassava mealybugs and the research needs were elucidated.

The problems of cassava mites, in particular cassava green mite, were also discussed, especially their pest status and damage caused, biology, ecology and global distribution, and how they can be controlled biologically with predators. Likewise, whiteflies on cassava were discussed in detail. For their management, host plant resistance is considered most important with avoidance of applying chemical pesticides which can disrupt not only their biological control but also that of other key cassava pests such as CM and the green mite. Because these pests can easily be transferred through movements of infested planting materials, effective quarantine measures, therefore, are crucial to prevent their spread. Other cassava pests and diseases deliberated in the presentation included stem borer, lacebugs, cassava hornworm, mosaic disease, bacterial blight, super-elongation disease, phytoplasma, and frog skin disease. Also proposed are some important criteria and future trends for managing them.

A4.3.2 CAB International (CABI). In sharing CABI's experiences relating to CM, Mr. Annamalai Sivapragasam chronicled the processes and events concerning the exploration and identification of natural enemies of CM, culminating in the discovery of the parasitoid *A. lopezi*. It began in the early 1970s when the mealybug from outbreaks in Congo, Zaire and also Brazil described as a new species was determined as *P. manihoti*, now referred as the CM. The scarcity of natural enemies from the outbreaks in Africa suggested the CM to be not endemic there, hence the search for its origin in the Neotropical regions. Early explorations in Columbia and the Caribbean region found a couple of *Phenacoccus* mealybugs (*surinamensis* and *grenadensis*) but the damage symptoms they inflicted were different from that of CM. Also, their complex of natural enemies supplied to Africa failed to develop on CM. Then, another *Phenacoccus* mealybug (*herreni*) was found in north-eastern South America. Although the damage caused was similar to that of CM in Africa, the insect was morphologically different. Moreover, its parasitoids failed to develop in the African CM.

In 1981, the origin of the CM was resolved to be in Central America (Paraguay, Bolivia and Brazil). The parasitoid *A. lopezi* was then found in the La Plata Valley and its taxonomy sorted out by the British Museum Natural History (London). By then, a complex of natural enemies from *P. manihoti* and their hyper-parasitoids have also been found in South America.

For introduction of *A. lopezi* to Africa, CABI in UK served as the third country quarantine before shipment to IITA. The parasitoid culture was set up on CM at the CIBC quarantine laboratory in UK and host specificity tests undertaken. After clearance, a clean culture was shipped to IITA in Nigeria in June 1981 and was successfully cultured there. Field releases were carried out in the experimental plots in IITA with successful recoveries achieved. In early 1990s, facilitated by Kenya IIBC, the parasitoid was introduced into Kenya by KARI. The lessons derived from all these efforts have included the following: correct identification is important to deal with complexes of natural enemies, performance of a natural enemy is crucial in competitive displacement (e.g. *A. lopezi* replacing the indigenous species *A.*

niombae), occurrence of a suite of hyper-parasitoids can affect the impact or stability of a parasitoid, and the sustainability of a good biological control programme must have healthy collaborative efforts.

A4.3.3 Asian Institute of Technology (AIT). This presentation by Mr. Prabhat Kumar described the geodatabase development and geographic information system (GIS) framework design for CM management in the GMS. The system aims to capture, store, analyze, manage, and to display the data in mapping format for the purpose of monitoring and forecasting the spread of the CM with the hope that knowing the situation would help towards developing a more effective management strategy against it. Mapping of the CM will help to identify hot spots and potential vulnerable areas so that farmers could make the necessary preparatory activities well ahead at field level. The example of an on-going GIS project on fruit/melon fly risk mapping for Cambodia, Lao, Myanmar and Vietnam was cited as a possible guiding model.

For the TCP project on CM, the countries envisaged to be involved are Cambodia, China, Lao, Myanmar, Thailand and Vietnam. Important data which are required would include:

- Cassava cultivation area (ha)
- Presence and location (GPS-assisted) of CM
- Rate of infestation (scale of 1 to 5)
- Period of infestation (month, location)
- *Anagyrus lopezi* status (present or absent)
- Rate of parasitization

A4.3.4 Food and Agriculture Organization of the United Nations (FAO). The lead consultant, Mr. Lim Guan Soon, presented the background, contents, purpose and expectations of the FAO regional TCP project on *Capacity Building for Spread Prevention and Management of Cassava Pink Mealybug in the Greater Mekong Subregion (Project No.TCP/RAS/3311)*. The GMS partner countries are Cambodia, China, Lao, Myanmar, Thailand and Vietnam. In the region, cassava is a major crop used for human consumption, animal feed and bioenergy production, with about 3 million smallholder farmers deriving their livelihoods from cassava production. Incursion by the exotic CM in 2008 has devastated extensive cassava areas in Thailand. To combat it, Thailand with help from CIAT, has introduced the parasitoid *A. lopezi* for biocontrol of the mealybug. This, and releases of local biocontrol agents (predatory lacewings), together with ecological pest management training efforts of field extension workers and farmers, were found helpful in providing effectual control of the CM, including stopping its further spread. Adopting this rationale and in response to calls for support, FAO initiated a regional TCP project to assist the GMS countries develop pest-spread prevention strategies and ecological biocontrol options to manage the CM. Also included in the assistance are conducting farmer training programmes to promote biocontrol and IPM among the smallholder farmers. Outcomes of the project include strengthening of the cassava production industry, improving the livelihoods of cassava farmers, protecting farm communities and the environment from pesticide contamination, preserving the agro-biodiversity and human capital development. The outputs and their associated activities are:

- (1) Strengthening research and technical support towards better understanding and management of CM, through:
 - understanding of pest-natural enemy ecology,
 - improving mass production methodology of biocontrol agents,
 - carry out in-country training of extension staff on mass production of *A. lopezi*,
 - mass multiplying *A. lopezi* and predatory lacewings, and
 - establishing CM surveillance with quality GIS database support.

- (2) GMS countries without CM prepared and capable to mass rear *A. lopezi* for field releases and embark on precautionary measures to prevent/delay entry of the CM.
 - precautionary measures to undertake include raising public awareness of CM, intensifying quarantine measures, promote production and use of local clean planting materials, prohibit cassava cross-border movements, treat/use pest-free planting materials, etc., and
 - when CM presence confirmed, countries concerned to import *A. lopezi* from Thailand for either direct field releases or to mass multiply for subsequent field releases.
- (3) Enhancing capacities of extension workers to conduct FFS on CM and of farmers to effectively manage the mealybug through:
 - training in ToT, in-country subject matter workshops, cross-border study visits, stakeholder meetings, and
 - farmer training in FFS, and participation in farmer congresses for experience sharing among farmers, extension workers and other stakeholders.

For effective project implementation in each country, a designated National Project Coordinator (NPC) will execute all agreed activities through the Project Management Unit (PMU) responsible for implementation arrangements, and where required, also receives support of the Project Steering Committee (PSC) which monitors outcomes and provides guidance on corrective actions where needed, and the Project Technical Advisory Group (PTAG) which assists with technical issues.

All governmental contributions will be in kind, mainly salaries of staff engaged in project activities, infrastructural support and facilities such as office space, laboratory, insectary and field amenities. Services of consultants and FAO technical support services are also provided, as well as support costs for technical and training activities, expendable/non-expendable equipment, official travel, plus general and direct operating expenses. The TCP project has a total budget of USD 491,000 and would run for two years.

A5. Key Issues and Considerations

Based on the country presentations including those of the working groups on work plans and the experiences shared by the international organizations in attendance, and the plenary discussions thereof, as well as the follow-up side consultations pertaining to some specific topics, a number of key issues have arisen as given below. Some of these merit considerations for more immediate actions while others to be acted upon over later stages of the project life. These are as elaborated below.

A5.1 Experience and expertise in Thailand. Since the incursion of CM in 2008, the Thai Government and the private sector, through DoA, DoAE and TTDI in particular, have jointly devoted relentless efforts to combat the pest menace. Following introduction of *A. lopezi* with assistance from CIAT, the subsequent mass production and releases of the parasitoid have to date provided remarkable control of the CM in many parts of the country. Over time and through the process, Thailand has gained tremendous amount of experience to deal successfully with the CM problem. At the same time, Thailand has also developed a nucleus of excellent home expertise encompassing a wide range of related aspects, such as field surveillance and mass-rearing of CM, mass production of *A. lopezi* parasitoid and its field releasing procedures, conducting participatory training to facilitators and farmers through ToT/FFS to enable them to effectively learn about CM biocontrol and its management, etc. As such, it is envisaged that Thailand could play a leading role in assisting other GMS partner

countries while the latter can look to learn from Thailand on how to get prepared and to manage and undertake spread-prevention strategies against the CM as and when incursion into the country occurs. In addition, Thailand could pioneer research to improve further the management of the CM, supply *A. lopezi* to countries needing it, and help train people from the collaborating countries.

A5.2 Mass production of *A. lopezi*. In visit to the DoAE Chonburi Pest Management Center (PMC) and from the presentation by TTDI (as well as from visits by some participants to TTDI in Huay Bong on previous occasions), it is evident that Thailand has developed the needed methodologies and capabilities to mass-produce the parasitoid *A. lopezi* for mass releases in the field by farmers. Both simple and sophisticated rearing techniques have been successfully developed to produce huge number of parasitoids. The former, seen in the Chonburi PMC during the field visit and which can be easily followed by many of the GMS partner countries, does not require large rearing houses, unlike that in TTDI where huge structures with more refined support facilities were specially constructed for the rearing of vast number of parasitoids. Besides the advanced rearing insectaries, TTDI in Huay Bong also has other excellent support facilities well-suited for training purposes, such as meeting/lecture room, cassava field in the vicinity, housing and in-house meal facilities for trainees, etc.

Undoubtedly, the parasitoid production at TTDI is more efficient in terms of being able to produce very much higher number of parasitoids per unit period. Nevertheless, the simpler technique as witnessed in Chonburi PMC is more than adequate to serve the purpose of supplying the needed parasitoids to farmers for releases in the GMS partner countries. Moreover, the technique can be further simplified such that an individual farmer can even rear the parasitoid on a smaller scale for releases in his/her own small farm as was explained at the Chonburi PMC.

A5.3 Regional training course on CM and mass-rearing of *A. lopezi* for its control. Except for Thailand, all other GMS partner countries have no experience in dealing with the CM problem, especially on its control with *A. lopezi* parasitoid. As such, it is of paramount importance that a regional training course on CM and mass-rearing of *A. lopezi* for use in its control be conducted for them. This should be led by DoA and DoAE at the Chonburi PMC in Thailand, with Ms. Winotai leading in the training. This course should be given immediate attention and be conducted as soon as possible with early August 2011 as the target period.

A5.4 Regional ToT course on FFS curriculum development for CM and its management. Presently, the field extension facilitators in the GMS partner countries who advise and train farmers are not well-equipped with the basic knowledge on cassava production & protection, CM and its parasitoid *A. lopezi*. To help prepare them so they can effectively undertake their role as FFS facilitator, it is necessary to conduct a regional 1-week ToT course on curriculum development for FFS on CM and its management for them. This is considered crucial in anticipation that the CM could incur (if not already present) and that *A. lopezi* would then be introduced. The course should be targeted for November 2011 and conducted in Huay Bong at TTDI in close collaboration with the staff of TTDI. The ToT course should be led by the project training consultant, with relevant DoAE staff also included as members of the training team. Upon completion of the course, the people trained should organize and conduct a 2-week ToT for other facilitators in their respective home countries.

A5.5 Length of ToT and FFS. Concern was expressed that ToT and FFS which are not season-long may suffer in their qualities. Since farmers in FFS meet only weekly and for half-a-day each time, running FFS season-long poses little problem and thus can remain so. However, for ToT with training sessions running continuously on daily basis, there are many difficulties, especially with perennial or long-season crops, like cassava. Besides the high costs, keeping people for long period away continuously from home or away from office is

often undesirable. For many such crops, shorter training period during critical crop stage has been found workable and satisfactory. As such, in the case of cassava, it would be acceptable for a specially-designed 2-week ToT on CM and its management, including FFS curriculum development, to be conducted in each of the GMS partner countries,

A5.6 Cross-border study visits. At this early stage where there are no tangible project outputs yet to show, it was agreed that the actual timing and locations for the study visits should best be determined at a later date. Tentatively, any time after the first quarter of 2012 would seem a likely possibility, because by then, it is envisaged that most of the participating countries would have implemented a number of activities and would have gained sufficient experience to share with others.

A5.7 Cassava materials and CM spread. It was highlighted that CM spread is mostly tied with movements of cassava materials, especially when such materials are infested. Hence, knowing the major locations or the key source points on where and how such movements occur could help greatly towards the formulation of measures suited for overcoming further spread of the CM. International agencies like CIAT, through linkages with the commercial sector, could have access of such information. In collaboration with FAO, the information collated could be made available to help project partner countries develop precautionary measures towards preventing the further spread of the CM pest.

A5.8 Need and importance of CM surveillance. Experiences from previous CM outbreaks have shown that a comprehensive surveillance system can play crucial role towards timely CM detection, hence leading to early intervention and minimizing spread of the pest. Instituting such a scheme with mapping support has thus formed an important component of the current project. However, of paramount importance is obtaining reliable field data. As such, it now remains for this to be carried out with full cooperation of all concerned, in particular the countries which will provide the required field data. AIT, in coordinating and guiding the efforts, would do its utmost to ensure that this is achieved to the best possible.

A5.9 Need to clarify presence of CM. Except for Thailand and Cambodia which have officially declared the presence of CM, the remaining GMS partner countries (China, Lao and Vietnam) have at the Inception Workshop indicated no report of CM. However, Mr. Aye of CIAT informed the meeting that based on damage symptoms and mealybugs observed in his visits with staff of country institutional counterparts, the CM is believed to be already present in south China (Yunnan) and southern Lao. In the latter case, it apparently was also observed in Vientiane. The pest is also believed present in southern Vietnam and north-central Myanmar. In view of the conflicting sighting and reporting, it is crucial that immediate follow-up efforts be carried out to clarify the exact status of CM in these countries. This is vital for determining what strategies/actions may be needed. If it is clarified that the CM is present, the country institute concerned should accordingly inform the National Plant Protection Organization (NPPO) which could then officially confirm its presence, inform AIT on location of incursion for updating the GIS database and thereon facilitate the importation of *A. lopezi* for its control. Otherwise, intensifying preventive measures should continue.

A5.10 Compliance with ISPM No. 3. When importing *A. lopezi* for CM control, the country concerned should make all efforts to comply with requirements of ISPM No. 3 under the “Guidelines for the Export, Shipment, Import and Release of Biological Agents and other Beneficial Organisms”. In this particular case, since the GMS partner countries have similar conditions as Thailand, it would suffice that what was done by Thailand concerning *A. lopezi* importation from Africa would serve the requirements and the tasks on host-specificity studies need not be repeated. Of critical importance for this is that it would help avoid unwarranted delay to bring in a proven and vital parasitoid which is urgently needed to help suppress a highly devastating pest like the CM.

A5.11 Scientific study visit to Paraguay and Benin. Thailand has proposed a scientific study visit to both Paraguay in South America and Benin in Africa to avail of the vast experiences gained by these countries from past CM outbreaks occurring there and the measures undertaken to deal with the problem. Whilst acknowledging that this could be useful and much could be learnt, the limited budget of the current project regrettably prohibits such an undertaking.

A5.12 Travel of international consultants to country. Although it is desirable that international consultants undertake travel to project countries to advise or to assist in specific project activities needing their expertise or inputs, such travel should be based on need basis and timed appropriately to match when these needs are actually required. For instance, the training consultant would serve best in a country with limited experience on ToT and/or FFS while the parasitoid mass rearing consultant making the travel shortly after a country has imported *A. lopezi* parasitoids.

A5.13 Recruiting national consultants. Presently, there are still GMS partner countries where the presence of CM is unclear. Hence it is doubtful whether locating a national consultant there is justifiable. As such, recruiting national consultant in a country should be considered only on need basis under a given situation that is considered pertinent and useful.

A5.14 Country focal point. For a project such as the regional TCP in which are involved many countries and different agencies within each country, the workshop felt it appropriate to have a mechanism to ensure that information exchange among project partners is not only communicated effectively but also in a timely manner. Establishing a focal (or contact) point within each country by designating a particular person/post would well serve such a purpose. For this project, it is recommended that the National Project Coordinator (NPC) be the country focal point, as follows:

Country	National Project Coordinator	Position & Affiliation	Contacts
Cambodia	Mr. Heng Chhun Hy	Deputy Director, PPD, General Directorate of Agriculture, MoAFF, Phnom Penh	Tel: (855)12 954 963 E-mail: chhunhy_heng@yahoo.com
China	Mr. Zhong Tianrun	Deputy General Director, Surveillance, Pest Outbreaks and Invasive Species Management, NATESC, Beijing	Tel: 86(010)59194548 E-mail: zhongtr@agri.gov.cn
Lao	Mr. Phoukaothong Sikaysone	Head of Entomology Unit, Plant Protection Centre, DOA, MAF, Vientiane	Tel: 856-20- 22202699 E-mail: pkaothongIPM@yahoo.com
Thailand	Ms. Watchreeporn Orankanok	Director of Pest Management Division, DoAE, Bangkok	Tel: 662-9406187 E-mail: watchreeporn@yahoo.com
Vietnam	Mr. Ngo Tien Dung	Deputy Director and IPM Programme Coordinator, PPD, Hanoi	Tel: (84-4) 851 3913 E-mail: ipmppd@fpt.vn

A5.15 Myanmar's participation. It was unfortunate that Myanmar could not process its project participation in time for participants to attend the Inception Workshop. Nonetheless, the country may still be interested to get involved in the project since it potentially also faces the problem of CM. In the meantime, FAO would continue to pursue and monitor Myanmar's interest on the possibility of her future participation in the project activities.

A5.16 Project completion. Because the terminal report of the project has to be submitted latest by early December 2012 to ensure there is adequate time for needed processing before project closure, it is considered necessary for all project activities to stop by September-end (latest early October 2012) and the final review workshop held at October-end or latest in early November 2012. All country collaborators should therefore take note to ensure their project activities will not extend beyond the end of September 2012 when drawing up their respective work plans. This will allow about a month for countries to analyze and compile their findings for presentation at the final review workshop.

**List of participants:
CM Inception Workshop May 31-June 2, 2011
Bangkok, Thailand**

Country	Name	Designation/ Organization
Cambodia	1 Mr. Heng Chhunhy	NPC, Deputy Director, PPD, General Directorate of Agriculture, MoAFF E-mail: chhunhy_heng@yahoo.com
	2 Ms. Srun Khema	Training IPM Coordinator, FAO IPM Programme E-mail: faoipm.natstaff@online.com.kh
China	3 Mr. Zhu Xiaoming	Assistant Agronomist, NATESC E-mail: zhuxiaoming@agri.gov.cn
	4 Mr. Dou Qinchuan	Senior Agronomist, Yunnan Plant Protection Station E-mail: douqch888@yahoo.com.cn
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	9 Ms. Amporn Winothai	Chief BioControl Research Group, DoA E-mail: winothai@yahoo.com
	10 Mr. Tiva Sempetch	Director, Chonburi Pest Management Center E-mail: pmc03@doae.go.th
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	12 Mr. Adul Vinaiphath	Vice President, Thai Tapioca Development Institute E-mail: adulv@tapiocathai.org
	13 Mr. Suthiporn Chirapanda	Consultant, Thai Tapioca Development Institute E-mail: chirapanda@yahoo.com
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	15 Mr. Pham Van Lam	Head of Division of Pest Diagnostic & Identification, NIPP E-mail: gdct_lam@yahoo.com
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	18 Mr. Tony Bellotti	Entomologist, CIAT E-mail: a.bellotti@CGIAR.ORG
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	25 Mr. Piao Yongfan	Senior Plant Protection Officer, AFS

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	26	Mr. Jan W. Ketelaar	CTA, IPM Programme E-mail: Johannes.Ketelaar@fao.org
	27	Mr. Alma Linda Abubakar	Programme Officer, IPM Programme E-mail: Almalinda.Abubakar@fao.org
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PROGRAMMES OF INCEPTION WORKSHOP
(Bangkok, Thailand 30 May-3 June 2011)

30 MAY: Monday		
Time	Activity	Notes
AM/PM	<ul style="list-style-type: none"> Arrival of participant in Bangkok <u>For GMS delegates</u>: Please ensure that your e-files of presentation and other requested documents are sent to FAO by 25 May (Wednesday) prior to your departure from home country, failing which you will have to proceed to FAO on arrival in Bangkok to hand over your e-files of report and documents for multiplication of hardcopies for the Inception Workshop 	<ul style="list-style-type: none"> FAO Regional IPM Office, <u>39 Maliwan Mansion, Phra Athit Road, Bangkok.</u> (Telephone: + 66 (0) 2-6974314). For non Bangkok residents, overnight stay in the Hotel (The Royal River Hotel) Meals on your own
31 MAY: Tuesday		
08.10h	<ul style="list-style-type: none"> Registration 	
I. Opening Session – Chairperson JW Ketelaar		
08.30h	<ul style="list-style-type: none"> Welcome and Opening remarks, ADG/Piao Yongfan 	
II. Pink Mealybug Research and Management in Thailand – Chairperson Piao YF		
08.45h	<ul style="list-style-type: none"> Progress of activities undertaken and future plans of DoA, Amporn Winotai 	
09.05h	<ul style="list-style-type: none"> Progress of activities undertaken and future plans of DoAE 	
09.25h	<ul style="list-style-type: none"> Progress of activities undertaken and future plans of TTDI 	
09.45h	<ul style="list-style-type: none"> Plenary discussions 	
10.00h	Tea/Coffee Break	
III. Status of Pink Mealybug Problem and Actions Taken in GMS countries – Chairperson J. Binamira		
10.20h	<ul style="list-style-type: none"> Country presentations (10 minutes per country, plus 20 minutes plenary):- Cambodia, China PR, Lao PDR, Myanmar and Vietnam 	
IV. Donor and International R&D Supporting Institutions – Chairperson JW Ketelaar		
11.30h	<ul style="list-style-type: none"> Important cassava pests and diseases: research development and support activities, CIAT & Nippon Foundation 	
12.00h	<ul style="list-style-type: none"> Experiences in cassava pink mealybug management, CABI 	
12.15h	<ul style="list-style-type: none"> GIS mapping in support of cassava pink mealybug management in the GMS countries, AIT 	
12.30h	<ul style="list-style-type: none"> Plenary discussions 	
V. FAO Regional TCP of Cassava Pink Mealybug		
12.50h	<ul style="list-style-type: none"> TCP overview and expectations, Lim GS 	
13.15h	Lunch Break	
VI. Workplan Session – Chairperson Lim GS		
14.15h	<ul style="list-style-type: none"> Briefing/discussions on preparation of TCP Workplan, Lim GS 	
15.00	<ul style="list-style-type: none"> Participants break up to work in separate Working Groups to develop country workplan. <ul style="list-style-type: none"> ➤ Grouping by country (NPC, National IPM Expert/Specialist, National Consultant) ➤ Other participants may choose to join any group to assist 15.30h-15.50h (Tea/Coffee Break) 15.50h-16.20h (AIT to meet with GMS countries altogether to formulate GIS support workplan (with only one representative per country, the others to continue working on their respective country workplan) On completion, to hand in Workplan to FAO workshop secretariat for print multiplication Also prepare in power point for presentation on 2 June 	<p><u>Topics to address:</u></p> <ul style="list-style-type: none"> Establishment of Project Management Unit (PMU), Project Steering Committee (PSC), Project Technical Advisory Group (PTAG) Subject matter training workshop Stakeholder meeting TOT for FFS facilitators FFS (including demonstration/ field day) Farmer congress GIS support workplan (AIT)
18.00 h	<ul style="list-style-type: none"> Reception Dinner – Fangnam Coffee House in the hotel 	

1 JUNE: Wednesday (Study Tour)		
08.00 h	<ul style="list-style-type: none"> • Departure from Bangkok 	
	<p><u>Lab/Field Visits:</u></p> <ul style="list-style-type: none"> • Rearing of <i>A. lopezi</i> parasitoid in DoAE , Chonburi Pest Management Center • Lunch in the Pest Management Center • Mealybug infested cassava fields with/without parasitoid releases • Dinner en-route, 	<ul style="list-style-type: none"> • Dinner on your own
18.00	<ul style="list-style-type: none"> • Departure from Chonburi to Bangkok 	
2 JUNE: Thursday		
Workplan Session (continued)		
08.00h	<ul style="list-style-type: none"> • Continue preparation of country workplan and submission to FAO workshop secretariat (for those who still have not completed the workplan on 31 May) 	
Country workplan presentations/discussions – Chairperson J. Binamira		
09.00h	<ul style="list-style-type: none"> • Workplan presentation/discussion (each country 15min presentation; 10 min discussion): Cambodia, China PR, Lao PDR 	
10.15h	Tea/Coffee Break	
11.35h	<ul style="list-style-type: none"> • Workplan presentation: Myanmar, Thailand, Vietnam 	
12.50h	<ul style="list-style-type: none"> • Plenary discussions on all Country Workplan 	
13.05h	Lunch Break	
Workplan of other work aspects: General Discussions – Chairperson JW Ketelaar		
14.15h	<ul style="list-style-type: none"> • Workplan for GIS support, AIT (15 min presentation; 15 min discussion) 	
14.45h	<p><u>Other topics to address, Lim GS</u></p> <ul style="list-style-type: none"> • Mass rearing of <i>A. lopezi</i> (in-country training, Thailand) • Mass rearing of <i>A. lopeze</i> (regional; GMS country) • 2 Cross-border field trips • Precautionary measures (for countries without CM) • Final Project Workshop • Consultants' travel schedules 	
16.00h	Tea/Coffee Break	
16.20h	<ul style="list-style-type: none"> • Continue discussion on project workplan • General discussion/other matters 	
16.50 h	<ul style="list-style-type: none"> • Closing Remarks, Piao Yongfan 	
17.00h	End	
18.00 h	Farewell Dinner /Boat cruise	
3 JUNE: Friday		
Departure from Bangkok		

Powerpoint Presentations by Presenters

The files are arranged as follows:

Thailand

A1. DoA

A2. DoAE

A3. TTDI

A3.1 TTDI VIDEO

Other GMS countries

A4. Cambodia

A5. China

A6. Lao

A7. Vietnam

International organizations

A8. CIAT

A9. CABI

A10. AIT

A11. FAO

REPORT

of

“CAPACITY BUILDING FOR SPREAD PREVENTION AND MANAGEMENT OF CASSAVA PINK MEALYBUG IN THE GREATER MEKONG SUBREGION”

(Regional Technical Cooperation Project TCP/RAS/3311)

INCEPTION WORKSHOP

**Bangkok, Thailand
31 May – 2 June 2011**

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC
Bangkok, July 2011**

PART B

WORK PLANS AND WORKING ARRANGEMENTS

[Included in this **Part B** are primarily the project work plans and the working arrangements. These are categorized into two broad groups, namely (1) the regional and general work plans which involve the countries collectively and (2) the country-specific work plans which cater mainly to the individual country. The plans specify **what** the particular activities are, including **where**, **when**, **how**, and **who** will implement them.

“CAPACITY BUILDING FOR SPREAD PREVENTION AND MANAGEMENT OF CASSAVA PINK MEALYBUG IN THE GREATER MEKONG SUBREGION”

(Regional Technical Cooperation Project TCP/RAS/3311)

Prepared at

INCEPTION WORKSHOP

Bangkok, Thailand

31 May – 2 June 2011

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC
Bangkok, July 2011**

B. Work Plans and Working Arrangements

A prime objective of the Inception Workshop was to develop and agree on the project work plans, including the working arrangements on their implementation, as guided by the most current information gained from feedback at the workshop. The purpose of the work plans is to enable those concerned to be clear on what the specific activities and targets are, the timeline to achieve them, and who will be responsible.

Participants at the workshop have formulated the plans to the best possible of what they can foresee. However, some activities under certain situations may need to be amended with time and with new developments. As such, it is acknowledged that whilst some of these plans may be set within specific timeframe, they are not rigidly cast and inflexible. All concerned will nonetheless do their utmost to adhere to the timing laid down for the tasks, unless future events dictate otherwise.

The project activities can be categorized into two broad groups. They are (1) the regional and general work plans which involve the countries collectively and (2) the country-specific work plans which cater mainly to the individual country. Described below for implementation are the project work plans and the working arrangements that are established for these two categories of activities. These specify **what** are the specific activities, including **where** (e.g. locations such as institute, village, town, province, whole country, etc), **when** (i.e. which period of the year), **how** (e.g. people to be trained, needed facilities, process, etc), and **who** will implement them (e.g. person(s) or institution(s) responsible or to lead).

B1. Regional and General Work Plans

B1.1 Regional training courses and study visits.

WHAT (activities)	WHERE	WHEN	HOW	WHO
1. Regional Training Course on mass rearing of CM and parasitoid.	DoAE Chonburi PMC	Early August 2011	2-3 participants per country; 6 countries	Dr. A. Winotai (DOA), DoAE, FAO Training Consultant, members of training team.
2. Regional ToT Course on curriculum development for FFS on CM and its management	Huay Bong, TTDI, Korat	November 2011	2-3 participants per country, 6 countries	Ms.Tattanakorn Moekchantuk (FAO Training Consultant), DoAE, TTDI, members of training team.
3. Cross-border study visits	To firm up nearer the time of visits.	After first quarter of 2012	2-3 participants per country, 6 countries	To firm up nearer the time of visits.

B1.2 CM surveillance, occurrence and introduction of *A. lopezi* parasitoid.

WHAT (activities)	WHERE	WHEN	HOW	WHO
1. Surveillance of CM	All participating GMS partner countries	Right away and without delay	<ul style="list-style-type: none"> • AIT develops guidelines for data collection • GMS country counterparts initiate data collection, supply information to AIT • AIT processes data, produces maps, uploading to FAO IPM website. 	AIT and all participating GMS country counterparts
3. To clarify CM occurrence in countries with conflicting reports on CM presence.	Locations where CIAT indicated presence of CM	Right away and without delay	<ul style="list-style-type: none"> • NPC/relevant staff in countries to contact Dr. Aye (CIAT) for details of sites (& local contacts) pertaining to their CM observation. • Local staff to visit sites to survey • Do wider area survey for CM 	NPC/relevant staff in China, Lao and Vietnam
4. When CM presence confirmed.				
<ul style="list-style-type: none"> • Report to the National Plant Protection Organisation, which, in turn, communicates with AIT for GIS database update 	Wherever found	Whenever found	From survey conducted or other reports	Whoever found (China or Lao or Vietnam)
<ul style="list-style-type: none"> • Initiate preparation to import <i>A. lopezi</i> parasitoid 	Country having the parasitoid	Right away and without delay	Local staff trained in Chonburi PMC to provide technical expertise	Government authorities of concern in China or Lao or Vietnam. (Applies also to Cambodia with CM).
<ul style="list-style-type: none"> • Introduce <i>A. lopezi</i> parasitoid 	Country having the parasitoid	As soon as feasible	<ul style="list-style-type: none"> • Contact/plan with exporting country • Shipping <i>A. lopezi</i> • Receipt of <i>A. lopezi</i> • Quarantine, mass rearing of <i>A. lopezi</i>. 	Plant protection institution of concern in China or Lao or Vietnam, & Cambodia
<ul style="list-style-type: none"> • Field release, 	In areas	As soon as	According to	Plant

WHAT (activities)	WHERE	WHEN	HOW	WHO
monitoring and impact evaluation of <i>A. lopezi</i> parasitoid	infested with CM	feasible when sufficient parasitoids available.	procedures learnt from training in Chonburi PMC	protection institution of concern in China or Lao or Vietnam, & Cambodia

B1.3 Consultants of CM TCP project.

WHAT (activities)	WHERE	WHEN	HOW	WHO
1. Travel by International Consultants	To project GMS partner countries	Appropriately timed to match when the needs are required.	On need basis.	LTC, Mass-rearing Biocontrol Consultant, & Participatory Training Consultant
2. Recruitment of National Consultants	In project GMS partner countries	As and when needed	<ul style="list-style-type: none"> On need basis. Individual country to inform & negotiate with FAO when need arises. 	NPC of GMS partner countries

B1.4 Regional project management and working arrangements.

WHAT (activities)	WHERE	WHEN	HOW	WHO
1. Country focal point (or contact).	In project GMS partner countries	Right away and without delay	E-mail or phone communication.	NPC of GMS partner countries
2. Myanmar's participation	In-country and regional activities of project.	As soon as the Government signs into participation	Upon the country Government signing into participation	Government of Myanmar
3. Project completion				
<ul style="list-style-type: none"> End of all in-country project activities 	In project GMS partner countries	By end of September 2012	All in-country project activities stopped, with submission to FAO-RAP of final report on all project work done.	All project GMS partner countries
<ul style="list-style-type: none"> Final Review Workshop 	Bangkok	End of October 2012	FAO Regional TCP Project to arrange	All project partners
<ul style="list-style-type: none"> Submission of Project Terminal Report 	FAO-RAP, Bangkok	November-end or early December	Report to contain detailed results of all project	Lead Technical Consultant

WHAT (activities)	WHERE	WHEN	HOW	WHO
		2012	components and conclusions, plus the Terminal Statement/FAO's recommendation to country Governments.	

B2. Country-specific Work Plans and Working Arrangements

The country-specific activities are largely training activities and in-country project management. Briefly, these are as described below.

Item	Training Activities
1	Specially-designed short ToT (in-country); 1 per country <ul style="list-style-type: none"> • 2 weeks • About 30 participants (including IPM trainers, national trainee facilitators, National IPM Coordinator, National Consultant, invited specialists and consultants)
2	Subject matter training workshop (in-country); 1 per country <ul style="list-style-type: none"> • 4 days • About 30 participants (including IPM trainers, facilitators, National IPM Coordinator, National Consultant, invited specialists and consultants)
3	Stakeholder meeting (in-country); 1 per country <ul style="list-style-type: none"> • 3 days • About 30 participants (including IPM trainers, facilitators, National IPM Coordinator, National Consultant, farmers and other invited specialists, stakeholders)
4	FFS (inclusive of farmer-managed demonstration fields/farmer field days as part of FFS); 54 FFS in total, number of FFS each country will undertake is dependent on the country's capacity, desire and the number indicated by the country. <ul style="list-style-type: none"> • Season-long • About 30 farmer participants each FFS
5	Farmer congress: 1 per country <ul style="list-style-type: none"> • 3 days • About 500 farmer participants plus National IPM Coordinator/Training Officers, National Consultants and invited specialists/officials

In-country project management
<ul style="list-style-type: none"> • Within each country, the National Project Coordinator (NPC) of the Project Management Unit (PMU) coordinates the implementation of the TCP project activities as outlined in the work plans. • The NPC will prepare progress reports summarising all activities undertaken in the project on a quarterly basis. • The NPC is also responsible for producing information materials (fact sheets, bulletins, brochures, etc for dissemination of project's results to farmers and relevant groups of civil society. Distribution to target audiences is through existing channels of communication available in the local department of agriculture. • The PMU is assisted from advice by the Project Steering Committee (PSC) which holds periodic meetings. • The PSC is responsible for taking preventive actions to avert delays in project implementation. • The PMU may also receive technical support from the Project Technical Advisory Group (PTAG), whose members are from relevant local technical institutions.

Guided by the above, delegates from the GMS partner countries who participated in the Inception Workshop developed their respective in-country work plans. Also, prior to the Inception Workshop, inquiries were sent to project collaborating countries to seek their feedback on in-country project management and working arrangements. Based on the responses received and the outputs from country delegates at the Inception Workshop, the respective country work plans and working arrangements are as given in the following: **B2.1** for Cambodia, **B2.2** for China, **B2.3** for Lao, **B2.4** for Thailand, and **B2.5** for Vietnam.

B2.1 Cambodia

A. Proposed timing to initiate/implement the activities.																			
OUTPUTS/ACTIVITIES	Qty¹	2011								2012									
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1. Raising awareness of CM																			
1.1 Prepare/print posters of CM																			
1.2 TV presentation																			
2. Preventing entry/spread of CM																			
2.1 Take appropriate level of phytosanitary measures																			
2.2 Conduct surveillance for CM																			
3. When present, to introduce <i>A. lopezi</i> parasitoid																			
3.1 Arrangements/preparation for importation of parasitoid with approval procedures of national plant quarantine authority																			
3.2 Importation of parasitoid																			
3.3 Mass rearing of parasitoid (for country with capacity/facility for mass rearing)																			
3.4 Undertake field releases/monitoring of parasitoid																			
3.5 Assess impact of parasitoid on CM																			
4. Training of extension workers and farmers																			
4.1 Conduct TOT	1																		
4.2 Facilitators' subject matter training/workshops	1																		
4.3 Stakeholder meetings	1																		
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields)	9																		
4.5 Organize the FFS's Field Day	3																		
4.6 Farmer congresses for experience exchange	1																		
4.7 Conduct the participatory action research for cassava mealybug management	3																		

A. Proposed timing to initiate/implement the activities.																			
4.8 Provide backstopping visit to Trainers at provincial level																			
4.9 Meeting with Trainers at provincial level	9																		
4.10 Training material	FFS guide and technical information on cassava																		
5. Project Management																			
5.1 National Project Coordinator (NPC) nominated	1																		
5.2 Establishment of Project Management Unit (PMU)	1																		
5.3 Quarterly progress report by NPC	5																		
5.4 Establishment of Project Technical Advisory Group (PTAG) ²	1																		
¹ Where relevant/possible, indicate the quantity of the activity to be undertaken, e.g. number of FFS proposed to do and indicate (with shading) when to start for each in the appropriate month. ² Optional, only for country wanting to also have these supporting setups.																			

B. Descriptions on <u>where</u> the activities would be initiated/implemented, including <u>who</u> will be leading/responsible and <u>how</u> these are to be undertaken.			
WHAT (activities)	WHERE (Locations, e.g. village, town, province, whole country, etc)	WHO (Person(s)/Institution(s) responsible or to lead)	HOW (Required materials, facilities, process, etc)
OUTPUTS/ACTIVITIES			
1. Raising awareness of CM			
1.1 Prepare/print posters of CM	Phnom Penh	PMU	Prepare & contract with shop for printing
1.2 TV presentation	Target provinces	PMU and Trainers	During Field Day and Farmer Congress
2. Preventing entry/spread of CM			
2.1 Intensify quarantine measures			
2.2 Stop importing cassava cuttings from infested area	BTB, BMC and Pailin	PMU and Trainer	Group meeting and discussion the infested by

			mealybug and the contamination.
2.3 Conduct surveillance for CM	BTB, BMC and Pailin	PMU and Trainers	Develop questionnaire, identify location & interview
3. Where absent, to introduce A. lopezi parasitoid			
3.1 Arrangements/preparation for parasitoid importation with approval procedures of national plant quarantine authority	Phnom Penh	DPPSP/ GDA	Prepare import permitted certificate
3.2 Importation of parasitoid	Thailand	PMU	Buy from the Thailand
3.3 Mass rearing of parasitoid (for country with capacity)	Phnom Penh	PMU	Trainer PMU, set up the facility and mass rearing
3.4 Undertake field releases/monitoring of the parasitoid	BTB, BMC and Pailin	PMU and Trainer	Release to FFS field, observation and data recording
3.5 Assess impact of parasitoid on CM	BTB, BMC and Pailin	PMU and Trainer	Develop the form for field evaluation
4. Training of extension workers and farmers			
4.1 Conduct TOT	Battambang province (BTB)	PMU and consultant	Prepare TOT curriculum and session guide, writing concept note and implementation
4.2 Facilitators' subject matter training/workshops	Bontheay Meachey	PMU	Prepare concept note and implement
4.3 Stakeholder meetings	Phnom Penh	PMU	Prepare concept note, identify and invite the participants and implementation
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields)	BTB, BMC and Pailin	PMU and Trainer	FFS 'curriculum, FFS site and farmer 's selection and implementation.
4.5 FFS 's Field Day	one in each province (BTB, BMC and Pailin)	Trainer	Writing concept note, submit to PMU for approval and implementation.
4.6 Farmer congresses for experience exchange	One in three provinces in Pailin	NPC, PMU & Trainer	Writing Concept note, submit to PMU for approval and implementation.

4.7 conduct action research for cassava mealybug management	BTB, BMC and Pailin	PMU and Trainer	Develop experimental design and implementation	
4.8 Provide backstopping visit	3 provinces above	PMU	Provide technical support, find out weak and strong point for improving ongoing activities.	
4.9 Tri-monthly meeting with Trainer at provincial level	3 provinces above	PMU and Trainer	Develop the meeting schedule	
4.10 Training material	Thailand	FAO	FAO Regional office to provide	
5. Project Management. Within the country, the National Project Coordinator (NPC) of the Project Management Unit (PMU) coordinates the implementation of the TCP project activities. The PMU is assisted from advice by the Project Steering Committee (PSC) and technical support from the Project Technical Advisory Group (PTAG). The following are members of the PMU, PSC and PTAG.				
Name of Members	Position and Organisation	Membership Confirmed or Proposed	Contacts	
			Telephone	E-mail
National Project Coordinator				
Mr. HENG Chhun Hy	Deputy Director of DPPSPS	Chief	(855)12 954 963	chhunhy_heng@yahoo.com
Project Management Unit (PMU)				
1.Mr. HENG Chhun Hy	Deputy Director of DPPSPS	Chief	(855)12 954 963	chhunhy_heng@yahoo.com
2.Ms. SRUN Khema	FAO-IPM Assistance of Project Coordinator	Administration & Financial	(855)17 337 338	faoipm.natstaff@online.com.kh
3.Mr. So Thavrith	Officer of DPPSPS	Technical	(855) 12 709 899	sothavrith@yahoo.com
4.Mr. Yin Chanthy	Officer of DIC	Technical		
Project Steering Committee (PSC)*				
Project Technical Advisory Group (PTAG)*				
1.H.E SO Khan Rithykun	General Director of GDA and Director of National IPM	Leader	(855)12 833 777	kunso@camnet.com.kh
2.Mr. NGIN Chay	Deputy Director of	member	(855)97 7788 111	chhay.ipm@online.com.kh

	National IPM			
3.Dr. PREAP Visarto	Acting Director of DPPSPS	member	(855)11 622 916	preapvisarto777@yahoo.com
4.Mr. KHAN Samban	Acting Director of DIC	member	(855)16 844 377	
5.Mr. CHOU Chey Thyrih	Project Coordinator of IPM-FAO	member	(855)12 826 692	thyrih.ipm@online.com.kh
6.CARDI Representative				
7.CIAT Representative				
8.RUA Representative				
* Not necessary for countries where the cassava pink mealybug is absent, and optional (if felt desired and useful) for those countries where the pink mealybug is confirmed present.				

B2.2 CHINA

B. Proposed timing to initiate/implement the activities.																			
OUTPUTS/ACTIVITIES	Qty ¹	2011								2012									
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1. Raising awareness of CM																			
1.1 Prepare/print posters of CM																			
1.2 Publish news of CM in print media (e.g. newspapers, etc)																			
1.3 Broadcast through radio																			
1.4 TV presentation																			
2. Preventing entry/spread of CM																			
2.1 Take appropriate level of phytosanitary measures																			
2.2 Conduct surveillance for CM																			
3. When present, to introduce <i>A. lopezi</i> parasitoid																			
3.1 Arrangements/preparation for importation of parasitoid with approval procedures of national plant quarantine authority		Depends on the Situation when CM is detected.																	
3.2 Importation of parasitoid																			
3.3 Mass rearing of parasitoid (for country with capacity/facility for mass rearing)																			
3.4 Undertake field releases/monitoring of parasitoid																			
3.5 Assess impact of parasitoid on CM																			
4. Training of extension workers and farmers																			
4.1 Conduct TOT	1																		
4.2 Facilitators' subject matter training/workshops	1																		
4.3 Stakeholder meetings	1																		
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields/farmer field days)	10																		
4.5 Farmer congresses for experience exchange	1																		
5. Project Management																			

B. Proposed timing to initiate/implement the activities.																	
5.1 National Project Coordinator (NPC) nominated																	
5.2 Establishment of Project Management Unit (PMU)																	
5.3 Quarterly progress report by NPC	5																
5.4 Establishment of Project Steering Committee (PSC) ²																	
5.5 Periodic PSC meeting ²																	
5.6 Conduct PSC meetings ²																	
5.7 Establishment of Project Technical Advisory Group (PTAG) ²																	
¹ Where relevant/possible, indicate the quantity of the activity to be undertaken, e.g. number of FFS proposed to do and indicate (with shading) when to start for each in the appropriate month. ² Optional, only for country wanting to also have these supporting setups.																	

B. Descriptions on <u>where</u> the activities would be initiated/implemented, including <u>who</u> will be leading/responsible and <u>how</u> these are to be undertaken.			
WHAT (activities)	WHERE (Locations, e.g. village, town, province, whole country, etc)	WHO (Person(s)/Institution(s) responsible or to lead)	HOW (Required materials, facilities, process, etc)
OUTPUTS/ACTIVITIES			
1. Raising awareness of CM			
1.1 Prepare/print posters of CM	Yunnan, Guangxi	NATESC Yunnan PPS Guangxi PPS	
1.2 Publish news of CM in print media (e.g. newspapers, etc)	Yunnan, Guangxi	NATESC Yunnan PPS Guangxi PPS	
1.3 Broadcast through radio			
1.4 TV presentation			

2. Preventing entry/spread of CM			
2.1 Intensify quarantine measures	Yunnan, Guangxi	NATESC Yunnan PPS Guangxi PPS	
2.2 Stop importing cassava cuttings from infested area	Yunnan, Guangxi	NATESC Yunnan PPS Guangxi PPS	
2.3 Conduct surveillance for CM	Yunnan, Guangxi	NATESC Yunnan PPS Guangxi PPS	
3. Where absent, to introduce A. lopezi parasitoid			
3.1 Arrangements/preparation for parasitoid importation with approval procedures of national plant quarantine authority			
3.2 Importation of parasitoid			
3.3 Mass rearing of parasitoid (for country with capacity)			
3.4 Undertake field releases/monitoring of the parasitoid			
3.5 Assess impact of parasitoid on CM			
4. Training of extension workers and farmers			
4.1 Conduct TOT	Guangxi	Guangxi PPS	
4.2 Facilitators' subject matter training/workshops	Guangxi	Guangxi PPS	
4.3 Stakeholder meetings	Guangxi	Guangxi PPS	
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields/farmer field days)	Yunnan 3, Guangxi 7	Guangxi PPS Yunnan PPS	
4.5 Farmer congresses for experience exchange	Guangxi	Guangxi PPS	

5. Project Management. Within the country, the National Project Coordinator (NPC) of the Project Management Unit (PMU) coordinates the implementation of the TCP project activities. The PMU is assisted from advice by the Project Steering Committee (PSC) and technical support from the Project Technical Advisory Group (PTAG). The following are members of the PMU, PSC and PTAG.				
Name of Members	Position and Organisation	Membership Confirmed or Proposed	Contacts	
			Telephone	E-mail
National Project Coordinator				
ZHONG TIANRUN	Coordinator	P	86(010)59194548	zhongtr@agri.gov.cn
Project Management Unit (PMU)				
1.ZHONG TIANRUN	Coordinator	P	86(010)59194548	zhongtr@agri.gov.cn
2.YANG PUYUN	member	P	86(010)59194542	yangpy@agri.gov.cn
3. GUO RONG	member	P	86(010)59194542	guorong@agri.gov.cn
4. WANG KAIXUE	Member, Yunnan PPS	P	86(0771)5848032	
5. ZHONG YONGRONG	Member, Guangxi PPS	P	86(0871)4141902	
6. ZHU XIAOMING	member	P	86(010)59194542	zhuxiaoming@agri.gov.cn
Project Steering Committee (PSC)*				
Project Technical Advisory Group (PTAG)*				
* Not necessary for countries where the cassava pink mealybug is absent, and optional (if felt desired and useful) for those countries where the pink mealybug is confirmed present.				

B2.3 LAO

C. Proposed timing to initiate/implement the activities.																			
OUTPUTS/ACTIVITIES	Qty¹	2011								2012									
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1. Raising awareness of CM																			
1.1 Prepare/print posters/leaflet of CM				■	■														
1.2 Publish news of CM in print media (e.g. newspapers, etc)																			
1.3 Broadcast through radio																			
1.4 TV presentation																			
2. Preventing entry/spread of CM																			
2.1 Take appropriate level of phytosanitary measures		■																	
2.2 Conduct surveillance for CM					■		■	■	■			■		■		■			
2.3 Conduct baseline survey			■																
3. When present, to introduce <i>A. lopezi</i> parasitoid																			
3.1 Arrangements/preparation for importation of parasitoid with approval procedures of national plant quarantine authority				■															
3.2 Importation of parasitoid				■															
3.3 Mass rearing of parasitoid (for country with capacity/facility for mass rearing)																			
3.4 Undertake field releases/monitoring of parasitoid				■															
3.5 Assess impact of parasitoid on CM																			
4. Training of extension workers and farmers																			
4.1 Conduct TOT	1								■										
4.2 Facilitators' subject matter training/workshops	1								■										
4.3 Stakeholder meetings	1									■									
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields/farmer field days)	2x4											■	■	■	■	■	■		
4.5 Farmer congresses for experience exchange	1																■		

C. Proposed timing to initiate/implement the activities.																		
4.6 Training material development																		
5. Project Management																		
5.1 National Project Coordinator (NPC) nominated																		
5.2 Establishment of Project Management Unit (PMU)																		
5.3 Quarterly progress report by NPC	5																	
5.4 Establishment of Project Steering Committee (PSC) ²																		
5.5 Periodic PSC meeting ²																		
5.6 Conduct PSC meetings ²																		
5.7 Establishment of Project Technical Advisory Group (PTAG) ²																		
¹ Where relevant/possible, indicate the quantity of the activity to be undertaken, e.g. number of FFS proposed to do and indicate (with shading) when to start for each in the appropriate month. ² Optional, only for country wanting to also have these supporting setups.																		

B. Descriptions on <u>where</u> the activities would be initiated/implemented, including <u>who</u> will be leading/responsible and <u>how</u> these are to be undertaken.			
WHAT (activities)	WHERE (Locations, e.g. village, town, province, whole country, etc)	WHO (Person(s)/Institution(s) responsible or to lead)	HOW (Required materials, facilities, process, etc)
OUTPUTS/ACTIVITIES			
1. Raising awareness of CM	Whole country	PMU	Computer, printer & camera needed to design printing materials
1.1 Prepare/print posters of CM	PPC	PMU	<ul style="list-style-type: none"> • Poster & leaflet collected from Chonburi Pest Management Centre to be used as sample & source of information; • Information gathered from the Inception Workshop, DOA & DOAE of Thailand; &

			<ul style="list-style-type: none"> • Photos to be provided by Regional Office
1.2 Publish news of CM in print media (e.g. newspapers, etc)			
1.3 Broadcast through radio			
1.4 TV presentation			
2. Preventing entry/spread of CM			
2.1 Intensify quarantine measures	Whole country	Plant Quarantine Division (PQD)	<ul style="list-style-type: none"> • PPC to provide PQD with information on current situation of CM; • PQD to issue a letter of notification to all Plant quarantine units at the checkpoints; • All importing planting materials must be treated.
2.2 Stop importing cassava cuttings from infested area	Whole country	Plant Quarantine Division (PQD) in collaboration with Provincial Agriculture Section	<ul style="list-style-type: none"> • PQD to declare infested zone; • All planting materials from the infested zone should not be removed and must be treated before growing within the infested zone.
2.3 Conduct surveillance for CM	4 target provinces (Vientiane Capital & Province, Borikhamxay & Champasack)	PMU &/or Provincial Agriculture Section Staff	GPS & surveillance forms
2.4 Conducting baseline survey	4 target provinces (Vientiane Capital & Province, Borikhamxay & Champasack) or where CIAT confirmed that CM present	NPC/PMU & Agriculture Section Staff	GPS & survey forms
3. Where present, to introduce <i>A. lopezi</i> parasitoid			

3.1 Arrangements/preparation for parasitoid importation with approval procedures of national plant quarantine authority	NPC to make arrangement with Regional Office and DOA	NPC/Focal Point	Importing supporting documents from Thai DOA might be needed
3.2 Importation of parasitoid	From Regional Rearing Centre, Thailand	Deputy DG of DOA	Importing permit
3.3 Mass rearing of parasitoid (for country with capacity)			
3.4 Undertake field releases/monitoring of the parasitoid	Where CM present	PMU & International Expert	
3.5 Assess impact of parasitoid on CM			
4. Training of extension workers and farmers			
4.1 Conduct TOT	PPC, Vientiane	PMU, National Consultant and/or Specialist	<ul style="list-style-type: none"> • Curriculum to be developed by National Consultant and PMU; • Concept note to be developed; • Participants to be selected from DAFO
4.2 Facilitators' subject matter training/workshops	PPC, Vientiane	PMU, National Consultant and/or Specialist	<ul style="list-style-type: none"> • Curriculum to be developed by National Consultant and PMU; • Concept note to be developed; • Participants who attended TOT to be trained
4.3 Stakeholder meetings	To be specified	PMU, National Consultant and Specialist from Thai DOA	<ul style="list-style-type: none"> • Concept note with a list of proposed participants; • Agenda; • Invitation
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields/farmer field days)	4 target provinces (Vientiane Capital & Province, Borikhamxay and Champasack)	District trainers/TOT graduates	<ul style="list-style-type: none"> • Curriculum; • Training materials

4.5 Farmer congresses for experience exchange	4 target provinces (Vientiane Capital & Province, Borikhamxay and Champasack)	District trainers in coordination with PMU	<ul style="list-style-type: none"> Plan for organizing farmer congress proposed by District Trainers.
4.6 Training material development	PPC	NPC, PMU members & National Consultant	

5. Project Management. Within the country, the National Project Coordinator (NPC) of the Project Management Unit (PMU) coordinates the implementation of the TCP project activities. The PMU is assisted from advice by the Project Steering Committee (PSC) and technical support from the Project Technical Advisory Group (PTAG). The following are members of the PMU, PSC and PTAG.

Name of Members	Position and Organisation	Membership Confirmed or Proposed	Contacts	
			Telephone	E-mail
National Project Coordinator				
Mr. Phoukaothong Sikaysone	Head of Entomology Unit, Plant Protection Centre, DOA, MAF	Confirmed	856-20- 22202699	pkaothongIPM@yahoo.com
Project Management Unit (PMU)				
Mr. Phoukaothong Sikaysone	Head of Entomology Unit, Plant Protection Centre, DOA, MAF	Confirmed	856-20- 22202699	pkaothongIPM@yahoo.com
Mr. Phoumy Kanya	National IPM Staff, National IPM Programme, Plant Protection Centre	Proposed	856-20-56497565	Phoumee_KANYA@yahoo.com
Ms. Somchanh Ouphanxay	Intern, National IPM Programme, Plant Protection Centre	Proposed	856-20-22025133	Osomchanh@yahoo.co.UK
Project Steering Committee (PSC)*				
	Deputy DG DOA			
	PPC Director			

Project Technical Advisory Group (PTAG)*				
	CIAT, NAFRI, NAFES & DOA/PPC			
* Not necessary for countries where the cassava pink mealybug is absent, and optional (if felt desired and useful) for those countries where the pink mealybug is confirmed present.				

B2.4 THAILAND

Proposed timing to initiate/implement the activities.																			
OUTPUTS/ACTIVITIES	Qty ¹	2011								2012									
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1 & 2 on raising awareness and preventing CM entry into country are no more relevant.																			
3. On A. lopezi parasitoid, only the one below is relevant																			
3.1 Training on impact assessment of parasitoid on CM																			
4. Training of extension workers and farmers																			
4.2 Participate in Facilitators' subject matter training/workshops	1																		
4.3 Stakeholder meetings	1																		
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields/farmer field days)	14																		
4.5 Farmer congresses for experience exchange	2																		
5. Project Management																			
5.1 National Project Coordinator (NPC) nominated																			
5.2 Establishment of Project Management Unit (PMU)																			
5.3 Quarterly progress report by NPC	5																		
5.4 Establishment of Project Steering Committee (PSC) ²																			
5.5 Periodic PSC meeting ²																			
5.6 Conduct PSC meetings ²																			
5.7 Establishment of Project Technical Advisory Group (PTAG) ²																			
6. GIS																			
¹ Where relevant/possible, indicate the quantity of the activity to be undertaken, e.g. number of FFS proposed to do and indicate (with shading) when to start for each in the appropriate month.																			
² Optional, only for country wanting to also have these supporting setups.																			

B. Descriptions on <u>where</u> the activities would be initiated/implemented, including <u>who</u> will be leading/responsible and <u>how</u> these are to be undertaken.			
WHAT (activities)	WHERE (Locations, e.g. village, town, province, whole country, etc)	WHO (Person(s)/Institution(s) responsible or to lead)	HOW (Required materials, facilities, process, etc)
OUTPUTS/ACTIVITIES			
1 & 2 on raising awareness and preventing CM entry into country are no more relevant.			
3. On <i>A. lopezi</i> parasitoid, only the one below is relevant			
3.1 Training on impact assessment of parasitoid on CM	Nakhonratchasima & Chonburi Province, Thailand	NPC in cooperation with DOA + DOAE	On the job training by world renown expert
4. Training of extension workers and farmers			
4.2 Participate in facilitators' subject matter training/workshops	To organize in consultation/by FAO	NPC	Participation in training course
4.3 Stakeholder meetings	Cassava Plantation Province, Thailand	NPC & Miss Areepan Upanisakorn	Stationary materials
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields/farmer field days) 14 FFS	In 14 provinces (member of Community Pest Management Center or (Community Lab)	7 PMC in cooperation with 14 Agri. Extension Provincial Office	Demonstration & learning materials and expenditure
5. Project Management			
5.1 National Project Coordinator (NPC) nominated	Ms. Watchreeporn Orankanok, DOAE	DOAE	Per directives
5.2 Establishment of Project	DOAE	DOAE	Per directives

Management Unit (PMU)			
5.3 Establishment of Project Steering Committee (PSC) ²	DOAE	DOAE	Per directives
5.4 Conduct PSC meetings ²	DOAE	DOAE	Per directives
5.5 Technical Advisory Group (PTAG) ²	DOAE	DOAE	Per directives
6. GIS	3 Selected pilot areas	DOAE	GPS purchase , GIS programme, Digital photo, Laptop
² Optional, only for country wanting to also have these supporting setups.			

B2.5 VIETNAM

D. Proposed timing to initiate/implement the activities.																			
OUTPUTS/ACTIVITIES	Qty¹	2011								2012									
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1. Raising awareness of CM																			
1.1 Prepare/print posters/leaflet of CM																			
1.2 Publish news of CM in print media (e.g. newspapers, etc)																			
1.3 Broadcast through radio																			
1.4 TV presentation																			
2. Preventing entry/spread of CM																			
2.1 Take appropriate level of phytosanitary measures																			
2.2 Conduct surveillance for CM																			
2.3 Conduct baseline survey																			
3. When present, to introduce <i>A. lopezi</i> parasitoid																			
3.1 Arrangements/preparation for importation of parasitoid with approval procedures of national plant quarantine authority																			
3.2 Importation of parasitoid																			
3.3 Mass rearing of parasitoid (for country with capacity/facility for mass rearing)																			
3.4 Undertake field releases/monitoring of parasitoid																			
3.5 Assess impact of parasitoid on CM																			
4. Training of extension workers and farmers																			
4.1 Conduct TOT	1																		
4.2 Facilitators' subject matter training/workshops	1																		
4.3 Stakeholder meetings	1																		
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields/farmer field days)	6																		
4.5 Farmer congresses for experience exchange	1																		

D. Proposed timing to initiate/implement the activities.												
4.6 Training material development												
5. Project Management												
5.1 National Project Coordinator (NPC) nominated												
5.2 Establishment of Project Management Unit (PMU)												
5.3 Quarterly progress report by NPC	5											
5.4 Establishment of Project Steering Committee (PSC) ²												
5.5 Periodic PSC meeting ²												
5.6 Conduct PSC meetings ²												
5.7 Establishment of Project Technical Advisory Group (PTAG) ²												
¹ Where relevant/possible, indicate the quantity of the activity to be undertaken, e.g. number of FFS proposed to do and indicate (with shading) when to start for each in the appropriate month. ² Optional, only for country wanting to also have these supporting setups.												

B. Descriptions on <u>where</u> the activities would be initiated/implemented, including <u>who</u> will be leading/responsible and <u>how</u> these are to be undertaken.			
WHAT (activities)	WHERE (Locations, e.g. village, town, province, whole country, etc)	WHO (Person(s)/Institution(s) responsible or to lead)	HOW (Required materials, facilities, process, etc)
OUTPUTS/ACTIVITIES			
1. Raising awareness of CM			
1.1 Prepare/print posters of CM		Plant Protection Department (PPD)	
1.2 Publish news of CM in print media (e.g. newspapers, etc)		Dr. Pham Van Lam, Ngo Tien Dung	
1.3 Broadcast through radio		PPD	
1.4 TV presentation		PPD	

2. Preventing entry/spread of CM			
2.1 Intensify quarantine measures		PPD	Training for the staff on indentify of CM
2.2 Stop importing cassava cuttings from infested area		PPD	MARD's Dcision
2.3 Conduct surveillance for CM		Dr. Pham Van Lam (NIPP) and PPD, 3 PPSDs	
2.4 Conducting baseline survey			
3. Where present, to introduce <i>A. lopezi</i> parasitoid			
3.1 Arrangements/preparation for parasitoid importation with approval procedures of national plant quarantine authority		PPD	PPD's approval
3.2 Importation of parasitoid		PPD	Project support
3.3 Mass rearing of parasitoid (for country with capacity)		Regional Center for Plant Protection, PPD; Technical assistance Dr. Lam	Upgrade the facility of the Center, support staff
3.4 Undertake field releases/monitoring of the parasitoid		Regional Center for Plant Protection, Plant Protection Sub Department (PPSD); Technical assistance Dr. Lam	
3.5 Assess impact of parasitoid on CM		Regional Center for Plant Protection, Plant Protection Sub Department (PPSD); Technical assistance Dr. Lam	
4. Training of extension workers and farmers			

4.1 Conduct TOT		Quang Ngai or Tay Ninh	Training materials, CM, <i>A. Lopezi</i>
4.2 Facilitators' subject matter training/workshops		Quang Ngai	Training materials, CM, <i>A. Lopezi</i>
4.3 Stakeholder meetings			
4.4 Conduct FFS (inclusive of farmer-managed demonstration fields/farmer field days)	6 FFS in 3 provinces (Tay Ninh, Binh Phuoc, Quang Ngai)	PPSD	Training materials, CM, <i>A. Lopezi</i>
4.5 Farmer congresses for experience exchange		PPD, PPSD	Demo fields, farmer groups
4.6 Training material development			
5. Project Management			
5.1 National Project Coordinator (NPC) nominated		Ngo Tien Dung, PPD	
5.2 Establishment of Project Management Unit (PMU)		Ngo Tien Dung, PPD	Invitation letter of PPD
5.3 Establishment of Project Steering Committee (PSC) ²			
5.4 Conduct PSC meetings ²			
5.5 Establishment of Project Technical Advisory Group (PTAG) ²		Ngo Tien Dung, PPD	Invitation letter of PPD
² Optional, only for country wanting to also have these supporting setups.			

24.7.2011