FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

USAID
FROM THE AMERICAN PEOPLE

MANAGE

राष्ट्रीय पादप स्वास्थ्य प्रबंधन संस्थान
NIPHM

Feed The Future India Triangular Training (FTF ITT)

"Plant Biosecurity and Food Safety"

(03 – 17 March, 2018)

Report

NATIONAL INSTITUTE OF PLANT HEALTH MANAGEMENT
Rajendranagar, Hyderabad – 500030, Telangana, INDIA

Foreword

NIPHM is a National level premier institute under Department of Agriculture, Cooperation & Farmers Welfare (Ministry of Agriculture & Farmers Welfare), Government of India established in the year 1966 at Hyderabad. It became an autonomous body in the year 2008 with the expanded scope of promoting environmentally sustainable Plant Health Management practices in diverse and changing agro-climatic conditions through capacity building programmes, besides providing inputs for policy formulation on Plant Health Management, Plant Biosecurity and International market access, Pesticide Management *etc*. at national and international level.

Feed The Future India Triangular Training (FTF ITT) program on ***"Plant Biosecurity and Food Safety"*** was conducted at NIPHM from 3rd to 17th March 2018. It is an Inter-Institutional event organized in collaboration with MANAGE, Hyderabad. This unique programme was attended by 23 executives representing two Asian and eight African countries. Out of which 23 officials, 8 are female and 15 are male executives. The learning process was designed by integrating interactive lectures, field visits and hands-on experiences coupled with cultural exposure. The main objective of the Training Program was to impart knowledge on International Regulatory Framework and SPS agreement, Skills on Pest Risk Analysis and Phytosanitary Treatments, Knowledge on Food Safety Regulations, Skills on Pesticide Management, Pesticide Residue Analysis and Risk Mitigations, Knowledge and skills on Integrated Plant Health Management Concepts and Practices based on Agro Ecosystem Analysis and Ecological Engineering for Afro-Asian countries..

This FTF ITT has created a platform for exchange of ideas/agricultural information's for developing sustainable livelihoods with Afro-Asian countries. I appreciate the organizing team led by Dr. Ch. Sreenivasa Rao and Dr. J. Alice R.P. Sujeetha, Course Directors and their team for effective planning and execution of the programme in a meticulous way. The efforts taken for the preparation of the training report is highly commendable. This work showed the sincere, commitment and dedicated initiatives of NIPHM and MANAGE and I wish that this collaboration will make new revolutions in the near future. I congratulate all the committee members who had made this event very successful.

(V. Usha Rani, IAS)
Director General

CONTENTS

1. INTRODUCTION

1.1 Background

To achieve ever green revolution in agriculture, a new partnership between US and India to address global food security was announced during the state visit of the then US President Mr. Barak Obama to India during November 2010. The effort included Triangular Cooperation adapting technological advances and innovative solutions to address Food Security Challenges in Asia and Africa.

The pilot stage focused on three African Countries *i.e.,* Kenya, Liberia and Malawi with potential to expand throughout the African Countries in future. Consequently, National Institute of Agricultural Extension Management (MANAGE), Hyderabad and National Institute of Agricultural Marketing (NIAM), Jaipur conducted 7 training programs covering 219 executives from Kenya, Liberia & Malawi. Participants Surveys were conducted in Kenya, Liberia & Malawi to assess the impact of training programs. Results were beyond exceptions, there has been considerable enthusiasm from the prospective Executives from Africa and Asia to participate in the similar training programs.

As a result, USAID and Ministry of External Affairs (MEA), Govt. of India designed a program named as Feed The Future India Triangular Training (FTF ITT) Program which was launched on 25th July, 2016 at New Delhi. During the program period until 2020, 1400 Agricultural professionals from 17 partner countries of Africa and Asia will be trained. The program will conduct 32, fifteen days duration training courses (excluding travel period) at select Indian institutions for 25 participants in each programme, and twelve, 10 days duration trainings (excluding travel period), in selected partner countries in Africa and Asia, for up to 50 participants per programme.

Each course module will focus on themes or sub sectors in which Indian institutions of reputed or have demonstrated comparative advantage to offer such trainings and ensure that it effectively responds to the target countries' capacity gaps. This approach is designed to respond to the needs of target countries based on the Demand Analysis carried out at the beginning of this program. National Institute of Agricultural Extension

Management (MANAGE), Hyderabad, India, an autonomous organization under ministry of Agriculture and farmers welfare, Government of India has been designated as lead Institution for implementations of the programs . As on date 5th April Feb 2018, MANAGE successfully completed 20 Training programs and trained 475 executives. In these training programs MANAGE covered 14 countries namely Afghanistan, Botswana, Cambodia, Democratic Republic of Congo, Ghana, Kenya, Liberia, Malawi, Mongolia, Mozambique, Myanmar, Sudan, Uganda and Vietnam.

National Institute of Plant Health Management (NIPHM) is a National level premier institute under Department of Agriculture, Cooperation & Farmers Welfare (Ministry of Agriculture & Farmers welfare), Government of India, established in the year 1966 at Hyderabad. It became an autonomous body in the year 2008 with the expanded scope of promoting environmentally sustainable Plant Health Management practices in diverse and changing agro-climatic conditions through capacity building programmes, besides providing inputs for policy formulation on Plant Biosecurity, Pesticide Management and Plant Health Management at national and International level.

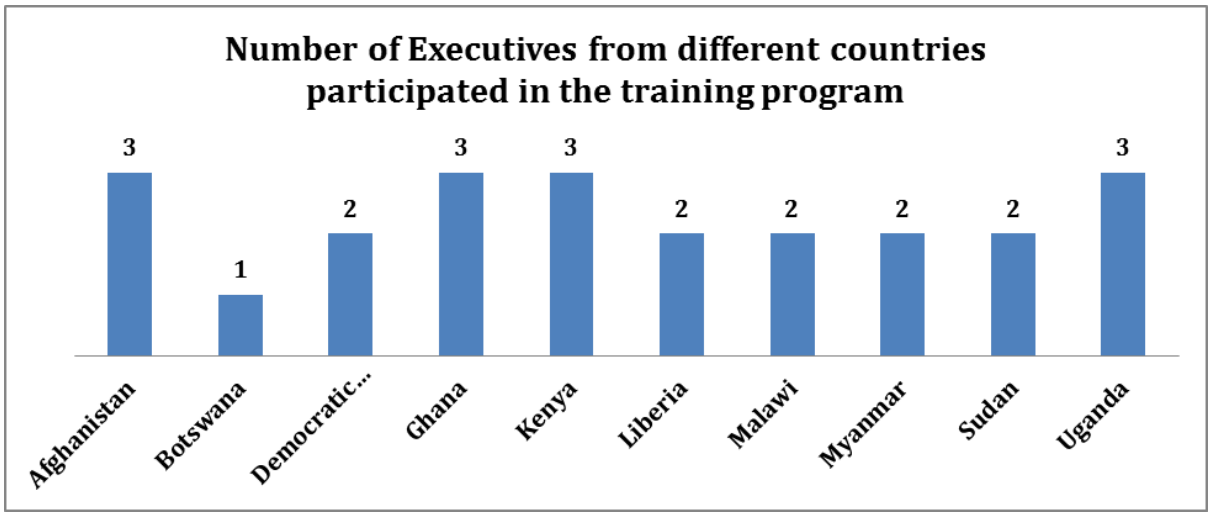
NIPHM is creating a pool of master trainers by training them on various aspects of plant health management strategies to promote environmentally sustainable plant health management practices to reduce excessive reliance on chemical pesticides. NIPHM is the nodal capacity building training center for stake holders involved in plant bio-security and quarantine issues, Pesticide Management including pesticide quality, food safety vis-à-vis pesticides residues and responsible use of pesticides.

With the advent of globalization and disappearance of tariff barriers, the world has truly become a global village with reference to communication and transport of agricultural commodities and food. Mass invasion of pests and diseases into newer areas, causing devastations and unbalancing the economy of many nations is witnessed. This really poses greater implications in the context of agricultural biosecurity of a nation. Developing and underdeveloped countries are the most affected in the absence of preparedness to combat the invasion. Biosecurity, encompassing safety of humans, animals, plants and other useful organisms against pests, diseases and other biological factors, is essential for promoting sustainable agriculture, food, nutrition and livelihood

security, regional and international trade, and equitable economic development. The science based pest risk analysis has become an important component for international trade of agricultural food commodities for prevention of introduction of new pests. Similarly, Food safety standards are focused for movement of food materials for the protection of human health. Food safety is receiving heightened attention worldwide as the important links between food and health are increasingly recognized. Improving food safety is an essential element of improving food security, which exists when populations have access to sufficient and healthy food. Countries following the Sanitary Phytosanitary (SPS) agreement must ensure the strict health and safety regulations through specified food standards. The important food contaminants in agricultural commodities are pesticide residues and hence food safety standards are focused for movement of food materials for the protection of human health.

NIPHM pioneered in training various international officials on these issues, and hence, the program is prepared with special focus on relevant international issues on food trade. During 2017, program entitled "*Plant Health Management Technologies and Approaches*" was conducted under the same scheme of FTF-ITT during 04-18 September.

An international training program on "***Plant Biosecurity and food safety***" is being jointly organized by USAID, MANAGE and NIPHM at NIPHM, Rajendranagar from 3rd to 17th March 2018. Twenty three participants representing two Asian and eight African countries participated in the training program. Out of 23 officials, 8 are female and 15 are male executives.



1.2 Objectives of the training program

- To impart knowledge on International Regulatory Framework and SPS agreement
- To impart skills on pest risk analysis and phytosanitary treatments
- To impart knowledge on Food Safety Regulations
- To impart skills on Pesticide Management, Pesticide Residue Analysis and Risk Mitigations.
- To impart knowledge and skills on Integrated Plant Health Management Concepts and Practices based on Agro Ecosystem Analysis and Ecological Engineering.

1.3 Key focus areas of training module

- International and National regulatory frame work
- SPS Agreement vis-à-vis Plant and Food Safety
- Impact of introduced pests and potential looming plant pest threats of world
- Pest Risk Analysis and Pest Surveillance Protocols
- Phytosanitary Treatments & Importance of stored grain pests in International trade
- Food Safety Concepts & Regulations
- Quality control of Pesticides
- Pesticide Residues in foods vis-à-vis International Food Trade
- Residue analysis of Raw Agricultural Commodities and challenges in residue monitoring.
- Risk analysis and fixation of Maximum Residue Limits
- Integrated Plant Health Management Technologies for Food and Plant Safety
- Agro Ecosystem Analysis and Ecological Engineering concepts for sustainable food production

The detailed program schedule is given in Annexure-I

1.4 Selection of Executives

The program was formally announced by the National Institute of Agriculture Extension Management (MANAGE), Hyderabad, India. The Program Management Unit (PMU), FTF-ITT, at MANAGE prepared the program brochure, initiated the process and provided good publicity in partner countries through their Point of Contact (POC), Indian Embassies, USAID Missions of respective countries, National Governments and previously trained executives.

The partner country has nominated the executives working in agriculture and allied departments and the PMU-FTF ITT of MANAGE has finalized the nominations.

1.5 Profile of the Executives

Twenty three executives from ten countries (3 from Afghanistan, 1 from Botswana, 2 from Democratic Republic of Congo, 3 from Ghana, 3 from Kenya, 2 from Malawi, 2 from Liberia, 2 from Myanmar, 2 from Sudan and 3 from Uganda) have attended and successfully completed the programme. The selected executives belonged to diverse working areas *viz.,* General Administrators, Deputy Directors, Agriculture and Rural Development Officers, Agricultural Economists, Scientific officers, Agricultural Extension officers, Quality control officers, Plant protection managers namely Livestock, Fisheries, Nutrition and Agribusiness *etc.*, representing public, universities and Govt. organizations in partner countries.

The list of Executives is enclosed in Annexure-II.

1.6 Management Team

The program is organized under the guidance of Smt V. Usha Rani, IAS, Director General, by The Course Directors, Dr. Cherukuri Sreenivasa Rao (Director-Pesticide Management) and Dr. J. Alice R. P. Sujeetha (Director-Plant Bio Security), assisted by Dr. Girish AG and Dr. Nirmali Saikia as Course Coordinators.

The Management Team is enclosed in Annexure-III.

2. METHODOLOGY

2.1 Training methodology

The training program was participatory in nature, which included lectures, group discussions, case studies, and hands on experience and field visits.

Each participant was expected to contribute ideas and take part in group activities thereon forming small groups to undertake various tasks allotted under the training. Although, experiential learning methodology was effectively incorporated in the program, the participants were expected to emulate learnings through group interaction, field visits and interactions with domain experts.

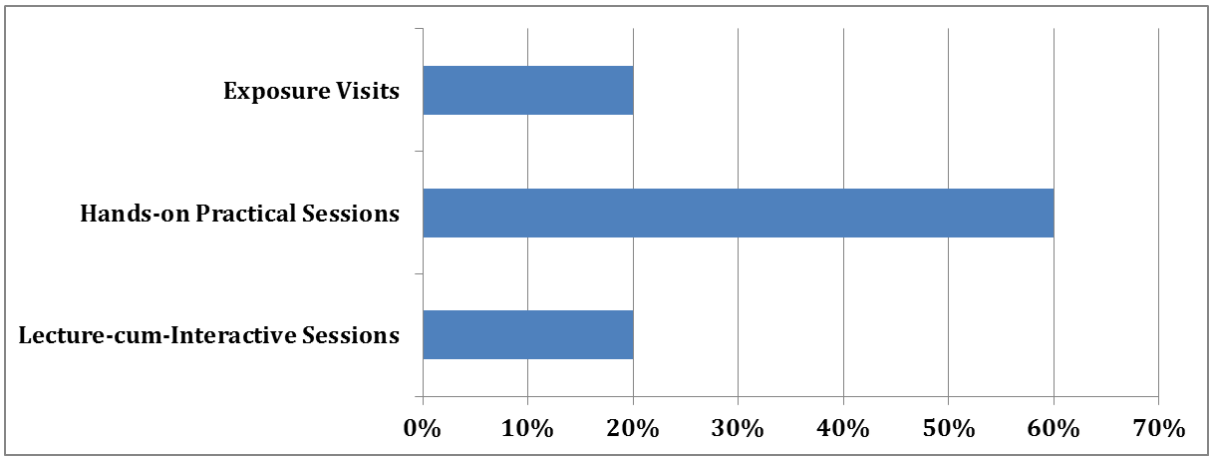
A Back at Work Plan was in-built to ensure the transformation of learning into action at their workplace. The effectiveness of the training is proposed to be monitored after conducting pre and post-tests to understand the impact of the training on the knowledge of the participants.

A learner-centered approach was followed to orient the participants on "*Plant Biosecurity and Food Safety*".

Methodology adopted for the program was as follows:

- Participatory approach.
- Participants expected to contribute ideas and work in groups.
- Experiential learning methodology (Cross learning, field experiences) Interactive session with the faculty of Institute and Guest Speakers.
- Lectures and Group discussions
- Field visits to National and International institutions, Agricultural University, Export pack house, Rural Technology Park, Kisan Call Centre *etc*.
- Special lectures/interactions with eminent personalities from the relevant field
- Practical exercises
- Hands-on experience and evaluations
- Group task assignment

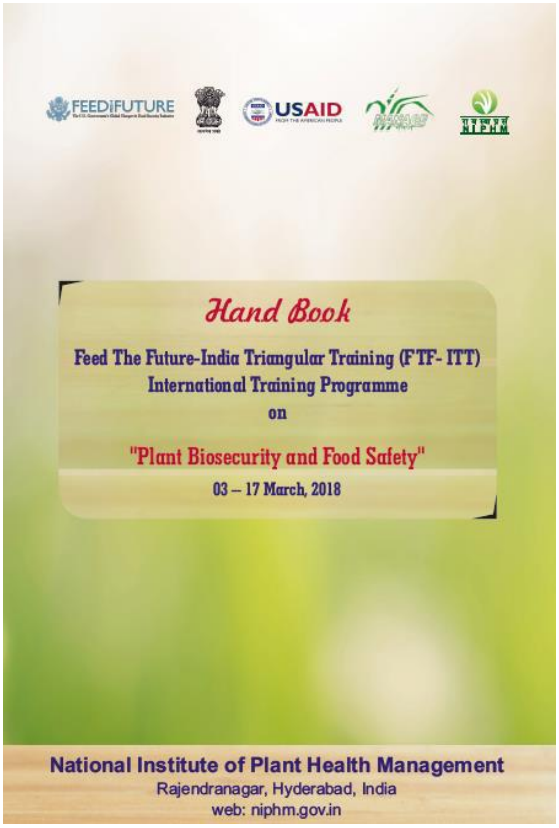
- Participants were made to present “Back-at-Work-Plans”.
- Daily yoga sessions were organized.
- Regular feedback on the program was collected.



2.2 Study material

- Printed study material, prepared by the Course Directors, faculty and experts of NIPHM on all the major themes were provided to the executives.

- Day-wise lecture / practical sessions, plans for field visits was also given to all executives in the form of "Hand Book" which also provide important information about NIPHM, Hyderabad and other important contacts at NIPHM.



- The soft copies of all the presentations made during the sessions were also provided to the executives.
- More than 250 numbers of photographs of lectures, field visits and other important activities of program were also provided to the Executives.
- The executives had full access to NIPHM laboratories and Library which is well equipped in the area of plant health management.
- In order to increase access to information and share knowledge on continuous basis, Wi-Fi as well as desk tops with Internet facility were provided during the entire course period.

2.3 Resource Persons

All the resource persons are the faculty of NIPHM as the scientific staffs of NIPHM are highly knowledgeable in the relevant field and thoroughly experienced in the conducting capacity building programs. Dr. Sanjay Arya, Joint Director (PP), Regional Plant Quarantine Station, Chennai was invited as Resource Person.

List of Key Resource Persons are given below:

- Smt. V. Usha Rani, IAS, Director General
- Dr. Cherukuri Sreenivasa Rao, Director-Pesticide Management
- Dr. J. Alice. R.P. Sujeetha, Director-Plant Bio Security
- Dr. Girish AG
- Dr. Nirmali SaIkia
- Dr. Mariadoss A
- Dr. Sreelatha E
- Dr. Bindu Madhavi
- Ms. Sridevi T
- Dr. Gupta CS
- Dr. Shaktivel
- Dr. Jesu Rajan
- Ms. Madhubala
- Dr. Baby Rani
- Dr. Narsi Reddy

2.4 Field visits

The executives were exposed to various field and Institutional visits *viz.,*

- National Institute of Agricultural Extension Management (MANAGE)
- International Crops Research Institute for the Semi-arid Tropics (ICRISAT)
- Rural Technology Park (RTP) of National Institute of Rural Development & Panchayati Raj (NIRD-PR)
- Indian Institute of Oilseeds Research (IIOR)
- National Bureau for Plant Genetic Resources (NBPGR)
- Kisan Call Centre (Farmers Call Centre) of PJTS Agricultural University
- Pomegranate Packing Facility at M/s. Sam Agritech,

2.4.1 Visit to MANAGE

National Institute of Agricultural Extension Management (MANAGE) was established in 1987, as the National Centre for Management of Agricultural Extension at Hyderabad, by the Ministry of Agriculture & Farmers Welfare, Government of India as an autonomous Institute, from which its acronym 'MANAGE' is derived. In recognition of its importance and expansion of activities all over the country, its status was elevated to that of a National Institute in 1992 and re-christened to its present name i.e., National Institute of Agricultural Extension Management. MANAGE is the Indian response to challenges of agricultural extension in a rapidly growing and diverse agriculture sector. The policies of liberalization and globalization of the economy and the level of agricultural technology becoming more sophisticated and complex, called for major initiatives towards reorientation and modernization of the agricultural extension system. Effective ways of managing the extension system needed to be evolved and extension organizations enabled to transform the existing set up through professional guidance and training of critical manpower. MANAGE is the response to this imperative need. The Professional Services offered in the following five streams viz., Management Training, Consultancy, Management Education, Research Information Services.

National Institute of Agricultural Extension Management (MANAGE), Hyderabad, India, an autonomous organization under ministry of Agriculture and farmers welfare, Government of India has been designated as *lead Institution for implementations of the FTF-ITT programs.* The team of Executives visited MANAGE on 8th March, 2018 and interacted with Smt. V. Usha Rani, IAS, Director General, MANAGE and team of scientists, and also participated in panel discussions on extension systems for effective transfer of technology, and also preparation of plans for back-at-work plans.

2.4.2 International Crops Research Institute for the Semi-arid Tropics:

The International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) is an international organization which conducts agricultural research for rural development, located in Patancheru (Hyderabad, Telangana, India) with several regional centres (Bamako-Mali; Nairobi-Kenya) and research stations (Niamey-Niger, Kano-Nigeria, Lilongwe-Malawi, Addis Ababa-Ethiopia, Bulawayo-Zimbabwe). It is founded in 1972. There are 8 research centers in sub Saharan Africa with the global headquarters in Hyderabad. The participants were taken to ICRISAT, Patancheru on 9th Mar 2018. Participants were shown presentation about ICRISATs work in Asia and Africa about creating smart foods, watershed crop production, agriculture that benefits farmers and consumers. These techniques are being implemented in more than 5000 villages in India. Kothapally, one of the villages in AP is also one of the places where farmers are profited by ICRISATs work. Then Mr. Murali M Sharma took the participants to visit the farms and briefed them about the various crops grown, biotechnology used and processes involved. The 6 major crops grown are pearl millet, finger

millet, groundnut, chickpea, sorghum and pigeon pea. Mr Murali stressed on the need to conserve water. He told us about the 2nd green revolution that is growing 2 crops in a year to feed the future generations.

2.4.3 Visit to Rural Technology Park (RTP) of National Institute of Rural Development & Panchayati Raj (NIRD-PR)

The National Institute of Rural Development (NIRD), an autonomous organization of the Ministry of Rural Development, Government of India, is the apex body for undertaking training, research, action research and consultancy assignments in the rural development sector in India. Its mission is to develop a

committed cadre of rural development professionals trained to deal with the challenges in rural areas. It is an autonomous organization under Department of Rural Development, Ministry of Rural Development, Government of India. The Rural Technology Park (RTP) of National Institute of Rural Development and Panchayati Raj, Hyderabad has been established with a view to uplifting the rural people in all aspects of life such as capacity building, rural employment generation and livelihood etc. It is established in an area of 65 acres of land. The executives visited RTP-NIRD on 8th March and interacted with various entrepreneurs established based on livelihood technology capacity building programs given to rural women.

2.4.4 Indian Institute of Oilseeds Research (IIOR)

The executives visited Indian Institute of Oilseed Research (IIOR), Hyderabad on 16th Mar 2018 and interacted with scientists of institute to know about the oil seed crops. The executives visited the Oil seed crop museum. Dr. P.Duraimurugan, Senior Scientist, Entomology explained about oil seed crops related to cultivation of different varieties and crop protection measures. He also interacted with executives and asked about oil seed crops growing in their countries and also encouraged the executives to promote these technologies in their countries.

2.4.5 National Bureau of Plant Genetic Research (NBPGR)

NBPGR Management and promote sustainable use of plant genetic and genomic resources of agri-hotricultural crop and carry out related research, coordinate and conducts capacity building in PGR management and policy issues governing access and benefit sharing of their use, and also engage in molecular profile of varieties of agri-horticultural crop and GM detection technology research. The executives visited National Bureau for Plant Genetic Resources (NBPGR), Hyderabad on 17th Mar 2018 and interacted with scientists of institute to know about the functions and activities of the Institute. Dr. Sarath Babu, Officer in-charge of the Institute explained different issues in import and export of germ

plasm and procedure followed by NBPGR for import of germ plasm of plant materials for research purpose. Dr. Anitha, Principal Scientist explained the role of NBPGR as quarantine authority for granting PSC for importing germ plasm materials for research purpose.

2.4.6 Kisan Call Centre (Farmers Call Centre) of PJTS Agricultural University

The executives visited Kisan Call Centre at PJTSAU campus which is funded and monitored by MANAGE, Hyderabad on 17th Mar 2018. The trainees were practically explained the entire functioning of Kisan Call Centre.

2.4.7 Pomegranate Packing Facility at M/s. Sam Agritech

The executives visited Pomegranate and Fig fruits Packing Facility at M/s. Sam Agritech on 9th Mar 2018 and have seen the pack house facilities on packing of pomegranate arils and whole fig fruits for export .

2.5 Visit to places of Historical and Cultural importance

Visiting historical places of cultural importance is an essential component of any training programme of international importance. The travel to places is not only refreshing the minds and body of executives, but also releases a vast amount of mental pressure accumulated through intensive learning process. As a part FTF ITT at NIPHM, the executives visited Shilparamam, Golconda, Ramoji film city on intermittent Sundays.

2.6 Cultural Evening (16th March 2018)

The evening was made more colorful at NIPHM. The main objective was to expose culture of partner countries; each country executives were encouraged to present their cultural heritage to other partner countries including India. Organizing committee of NIPHM informed all executives well in advance about cultural evening and facilitated them with required items and preparation.

2.7 Collective action and participatory learning

All the executives were divided in to groups to enhance learning in small groups throughout the training program for working on group assignments, including field/ Institutional visits and prepare for cultural programme.

S.No	Group Tasks	Mentor
1	Surveillance Methods	Gupta CS
2	Fruit fly lure preparation & trapping	Mariadoss A
3	Responsible Use of Pesticides	Ms. Sridevi T
4	Methods for removal of Pesticide Residues in Fruits and Vegetables	Dr. Nirmali Saikia

The groups were given responsibility for learning from interactions, collection of literature, photographs, contact details, use of library and identify useful technology to their respective countries. The group also participated and managed cultural programme successfully.

2.8 Life Membership to professional bodies and journals'

All the executives were made life members of Indian Journal of Plant Protection, which is a quarterly journal covering latest development in the plant protection published by Plant Protection Association of India. As a life member, they will receive Journal time to time.

2.9 Back-at-work-plans

The present program aimed at "Plant Biosecurity and Food Safety". Hence, the expected outcome is a professional commitment by each executive to try new initiatives learnt during the training programs at their work place after the training program. In the backdrop of orientation, inputs, interactions, study material and experiences received during the program, the executives prepared and presented individual "Back-at-work-plans" which would help operationalize the relevant concepts learned during the program in their respective countries. Back at work -plan also trace the connectivity between Indian experience and back home extension issues.

Details of individual Back-at-work-plans are given at Annexure- IV

2.10 Detailed Daily Report

Day-wise proceedings are prepared based on the different activities.

Day 1: 03.03.2018

The Registration Committee comprising Dr. A.G. Girish, Dr. Nirmali Saikia, Ms.T.Sridevi and Mrs. R. Madhubala welcomed all the trainees with garlands and all the participants registered for the training program. Online Pre course evaluation test was conducted to the participants by Dr. A.G. Girish, Dr. Nirmali Saikia, Mr. Liyakhat Ali Ahamed and Dr. C.S. Gupta. After tea break, Dr. Ravi Nandi Programme Manager, MANAGE explained the objectives and activities of MANAGE particularly FTF-ITT international training programmes. The interaction session was held with all the participants. The Course Directors, Dr. Ch. Sreenivasa Rao Director, (PMD) and Dr. J. Alice R.P. Sujeetha (PBD) have explained the significance of the course to the participants. The Director, PMD briefly explained the vision and mission of NIPHM and also next 15 days scheduled programme along with general information on medical, legal, administrative formalities

and instructions during their stay at NIPHM. Further, Dr. Ch. Sreenivasa Rao answered a number of queries raised by the participants on different issues *viz.,* medical facilities, travelling issues, food menu, cultural events *etc*.

The trainees were made into two groups (A & B) comprising twelve in A Group and 11 in B Group. After lunch break, the trainees were taken to biological control laboratory guided by Dr E. Sreelatha (Group A) and to plant health diagnosis laboratory guided by Mrs. R Madhubala (Group B) to make them acquaint with the various activities being undertaken in the laboratories. The trainees have visited biocontrol laboratory, bio fertilizer laboratory, nematology lab, vertebrate pest management laboratory, plant pathology laboratory and pest detection and diagnostic laboratory. The trainees have also visited Pesticide Formulation and Residues Analytical Center (PFRAC) where major analytical activities with respect to capacity building programmes, pesticide formulation analysis, bio product analysis and pesticide residue analysis were explained.

Day 2: 04.03.2018

The executive trainees visited Golconda Fort and Shilpa Ramam to learn about the heritage of India.

Day 3: 05.03.2018

Inaugural Function:

Dr. Ch. Sreenivasa Rao Director, Pesticide Management Division welcomed the chief guest Rani Ms. Rani Kumidini IAS, Executive Director, National Fisheries Development Board, Smt. Usha Rani, IAS, Director General, MANAGE & NIPHM and Dr. J. Alice R. P.Sujeetha, Course Director to the dias. The program was started with invocation, lighting of lamp by the dignitaries on the dias including some of the executive trainees.

Dr. Ch. Sreenivasa Rao Director, Pesticide Management Division gave an over view of the activities of NIPHM, different divisions working on various aspects. He highlighted that this Institute is imparting training to more than 2000 Government employees per year. The Institute is specialized in Bio Security, Pesticide Management, including state of art laboratories for analyzing pesticide residues and Quality Control of Pesticides. Besides above training programs this Institute is also conducting various research programmes to support the training activities. The labs of this Institute are ISO 17025 and ISO 17043 certified and more than 3,000 samples are being analysed for pesticide residues/year.

Smt. Usha Rani, IAS, Director General, MANAGE & NIPHM highlighted the genesis of feed the future India triangular training program. FTF programme was initiated with the visit of President of USA Barrack Obama to India, who felt the need to train the developing countries on latest technologies for feeding the future as the technologies

developed India are on small holdings which will suit to the needs of several Asian and African countries. She informed that to undertake this program, 60% of the funds are given by the USDA and remaining 40% are given by the Indian Government. Seventeen countries have been shortlisted for taking up these programs. Indian food production increased by 5 times although land is limited and is now self-sufficient in food production and India is exporting many of the agricultural produce to other countries including rice and spices. She also highlighted the important contributions of plant health management, soil health management, agronomy, use of resistant varieties, biosecurity, food security in view of WTO regime and different bio pesticides are being developed at NIPHM.

Mr. Saimullah Nasrat from Afghanistan thanked NIPHM for arranging this training programme, while another participant Mr. Copperfield from Ghana expects to know the alternative chemicals to methyl bromide which is banned in India and other countries and use of aluminium phosphide in *lieu* of methyl bromide. He also wanted to know more about quarantine procedures applicable in India

Smt. Rani Kumidini, IAS, Executive Director, National Fisheries Development Board was the chief guest. She highlighted the importance of training programs where in technology is transferred by experts through focused needs. She highlighted the WTO regime, trade in agriculture, bilateral agreements made between different countries. She stressed on food safety, which is vital for human health. She highlighted the importance of quarantine in preventing the entry of pest/pathogens giving the example of bird flu virus. She discussed the logistics for imports and exports of commodities and importance of increasing shelf life of perishable fruits and vegetables in quarantine stations for long testing periods. Since several National Institutes are located in the campus, she felt that provision may please be made to expose all trainees to these Institutes including NFDB so that latest knowledge can be imparted.

Dr. Alice Sujeetha Director PBD proposed vote of thanks to all the dignitaries on the Dias, Executive trainees, staff of Manage and NIPHM.

Then the executive trainees were made into four groups. The first one is led by Dr. Gupta and Madhubala on Pest Surveillance- Dr. Gupta informed the importance of Pest Surveillance in identifying the methodologies for survey of pests. Second group is on Fruit fly lure preparation which was led by Mr. Mariadoss. He highlighted the importance of fruit fly, different species of fruit fly (roughly more than 5000 species are reported across the globe) attacking in different agro climatic regions and different methods of preparation of lures to attract and destroy the fruit flies. He explained that how to prepare methyl eugenol lure and also CUE lure. By the end of the program participants will get hands on experience of preparing lures by themselves. He felt that all fruit flies cannot be attracted to one lure. Species specific lures are to be prepared to attract fruit flies. The third group on use of pesticides by Mrs. Sridevi and Er.Udayabhanu who explained that this program tells about safe use of pesticides for controlling pests including use of proper quantity of spray, spray technique, dosage, proper label reading, mixing of chemical and at the end disposal of used pesticide containers. The last group is on removal of pesticides. This program leader is Dr.

Nirmali Saikia who explained that nowadays many of the agricultural produce is having pesticide contamination, which we are eating directly, she felt that various techniques are used to reduce/ remove pesticide contamination on the produce so that food can be safer to eat. These simple techniques can be used by all to remove or reduce pesticide contamination.

In the afternoon, they were divided into two groups. Group A visited Plant Health Diagnostic Lab and Nematology lab, while Group B visited the Biological control laboratory including parasitoids, predators and microbial pesticides and bio fertilizers.

After undergoing these programmes, all the trainees were asked to carry out these programmes in their respective countries for six months and submit the compliance report to NIPHM Nodal Officers.

Day 4: 06.03.2018

Dr. Ch. Sreenivasa Rao Director, Pesticide Management Division gave a talk on WTO-SPS Agreement Vis-à-vis Plant and Food Safety in the morning session. He highlighted the importance of start of IPPC, ISPM (International Standards for phytosanitary measures), Codex Alimentarius Commission. Dr. Sreenivasa Rao gave an introduction of GATT: The General Agreement on Trade and Tariff was evolved across many countries to negotiate on business of various commodities from one country to other, TRIPS: Trade Related Intellectual property rights. He said that WTO was started on 1st January 1995 with 170 countries are signatories and other countries like Sudan are still examining whether to join or not.

A lecture on Concept of Plant Bio- Security and Issues related to it by Dr. J. Alice RP Sujeetha, Director, Plant Bio Security. She informed that in 1950s India produced 50 MT food grains, there were famines, poverty *etc*, but now the production went up by 5 folds and India became self-sufficient and also became a major exporter of food grains to other countries. Dr. Sujeetha has described about bio terrorism where in microbes were used to destabilize countries economy during world war II period, where in, the importance of 4Ts are affected *viz.*, tourism, trade, travel and transport in relation to bio security. The country should be very alert on invasive pests or otherwise it will ruin the economy. Integrated coordination is required both at National and International level. Stringent measures should be followed for safe agricultural trade in the country.

Dr. Sanjay Arya, Dy. Director PP, Directorate of Plant Protection, quarantine and storage, Government of India, Chennai gave a talk on Inspection and sampling procedures for exports and import of Agricultural Commodities. He informed that in India 5 Regional plant protection stations are taking care of plant quarantine works they are located at Chennai, Mumbai, Calcutta, Delhi and the fifth one at Amritsar. For import of commodities, Plant Quarantine Order 2003 is followed. The queries of various executives are answered by the experts.

In the last session Mr. Mariadoss, Asst. Director (RPM) handled session on fruit fly surveillance and fruit fly lure preparation. Fruit flies are responsible for 20-40% of loss in fruits and vegetables both in the files and post-harvest scenario. Tephritid fruit flies cause devastating direct losses to many fresh fruits and vegetables. In addition, few insects have a greater impact on international marketing and world trade in agricultural produce than tephritid fruit flies. With expanding international trade, fruit flies as major quarantine pests of fruits and vegetables have taken on added importance, triggering the implementation of area-wide national or regional (transboundary) control programmes. A game on the techniques for fruit flies management in fruit orchards and vegetable garden was performed during the class. Videos on life cycle of fruit flies and management was shown to trainees. Then the trainees were taken to fruit fly lab and practical sessions was undertaken on Fruit Fly Lure preparation and low cost bottle trap preparation.

Day 5: 07.03.2018

The days schedule was started with the recap by Mr. Mariadoss on previous days proceedings of the lectures.

Dr CS Gupta gave a detailed talk on Pest Surveillance and Surveillance methodologies. He has explained in detail about the different methods of survey, principles of survey and gave a practical training on different survey methods like random survey, stratified survey, cluster survey by making them to different groups.

Dr. Shaktivel Asst. Scientific Officer delivered a lecture on Vermicomposting, the importance of preparing vermin compost, disposal of urban waste is a major problem like pollution in the atmosphere, bad odor, and chemical fertilizers and pesticides are causing lot of pesticide residues etc. Hence he felt that organic agriculture is the important task which takes care of about pesticide residues etc. For organic agriculture, manures and compost is important. Among composts, different field trash, green leaves, stalks of plants and un economical plants like weeds especially *Parthenium* can best be used to decompose so that their nutrient content can he enhanced.

Dr. Shaktivel took the trainees to live demonstration of vermicompost pits, which are constructed with cement structures in which all dried fallen leaf collected from the farm was put, in layers, cow dung slurry, rock phosphate and microbial culture were

applied and frequent sprinkling with water was done. The earthworms were released. To maintain optimum temperature, the pits were covered with shed and water was frequently sprayed. At the end of 3-4 months, after complete decomposing the worms were removed and the left over material was sieved through a mesh so that fine material was dropped in. The un decomposed and heavy things were thrown on other side, which can be recycled in preparation of compost.

Day 6: 08.03.2018

The executive trainees visited Rural Technology Park (RTP) of National Institute of Rural Development and Panchayati Raj (NIRD &PR). In the afternoon the executives visited MANAGE, Hyderabad.

Day 7: 09.03.2018

Executives visited International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and Pomegranate Export Unit-Cold Treatment (Phytosanitary Treatment) facility.

Day 8: 10.03.2018

During the forenoon session a practical exercise was conducted by Dr. A.G.Girish and Dr. C.S. Gupta on overview of phytosanitary measures. The executive trainees were taken to Stored Grain Insect Pests and Fumigation laboratory and explained the procedure of grain fumigation. In the afternoon session quarantine insects detection and identification of stored grain pests and fruit flies of export concern by Mr. Mariadoss, Assistant Director (RPM).

Later quarantine pathogens detection and identification of f export concern was explained by Mrs. Madhubala. The trainees undertook practical sessions on identification of different storage insects, fruit flies and pathogens of export concern in pest detection and diagnostic laboratories of Plant Biosecurity Division.

Day 9: 11.03.2018

The executive trainees were taken to outdoor visit of Ramoaji Film City to learn about the Indian culture.

Day 10: 12.03.18

In the forenoon session Dr. Ch. Sreenivasa Rao handled an important subject on Regulations for quality control of pesticides. The different schedules of Insecticide Act, 1968 and Insecticide Rules, 1971 were explained to the trainees. The role of Central and State Governments and Insecticide inspectors were explained to the trainees. The role of Insecticide Inspectors, method and procedures for sampling, role of analyst, test procedures, prosecution procedures were explained in detail. During the session, an interactive cross learning happened as it was discussed on methods followed in various countries for quality control of pesticides. It was also discussed on procedures for registering pesticides and responsible use.

Then the trainees were given with exposure visit to Plant Health Engineering Workshop, Biofertilizer Lab, guided by Dr. OP Sharma and Er. Udaya Bhanu. After lunch, Sri CV Rao explained about the activities of pesticide formulation laboratory, and the testing protocols followed for QC of pesticide formulations. All the executives took a brief tour to the laboratory and Dr. Jaya Devi oversaw the practical sessions on safe use of pesticides.

Day 11: 13.03.2018

Dr. Sreenivasa Rao, Director, Pesticide Management Division, NIPHM, Hyderabad delivered a lecture "Pesticide Residues in Food Commodities vis-à-vis Food Safety Regulations". The lecture is majorly focused on food safety regulations in India and other countries, pesticide residue status, importance of GAP for reducing pesticide residues in raw agricultural commodities for food safety and human safety. An interactive sessions was followed to understand the issues of pesticide residues in various countries, and the initiatives taken for dealing with pesticide residues issues for food safety. All the participants participated and shared the information very actively, and helped all for understanding about other nations.

Ms. Sridevi showed the Pesticide Residue Laboratory of NIPHM and given a demo of available equipment in the laboratory like (GC) Gas Chromatography, (LC) Liquid Chromatography and other facilities available for detection of pesticides in the agricultural produces. Dr. Baby Rani explained about the protocols for pesticide residue analysis on different commodities.

Dr. Nirmali Saikia has explained about different methods of removal of pesticide contamination in agricultural produce like grapes, tomatoes and cucumber and vegetables so that the risk of pesticide can be minimized using these techniques. These techniques include simple washing of produce say fruits and vegetables in running tap

water, peeling the skins of cucumber, bottle gourd *etc* and also dipping the produce in 2% salt solution for 10-15 minutes which will reduce the pesticide contamination present in the produce.

Day 12: 14.03.2018

Dr. E. Sreelatha, Assistant Director, delivered a lecture on AESA, the basic concepts of Agro Ecosystem Analysis (AESA) and Ecological engineering based Plant Health Management. Dr. Sreelatha explained agro ecosystem, forest ecosystem and marine ecosystems in brief and while concentrating on agro ecosystem, she has explained four steps of AESA Analysis, viz., visits to the field in four groups with necessary tools like note books, pencils, erasers, scales, plastic covers, second step is to make observations of various parameters like plants their status, soil status, moisture content of soil, deficiency symptoms, pests, diseases, weeds that are seen including recording all observations like plant height, number of tillers, number of flowers, fruits etc. and the third step is to draw diagrams of what they have observed and recorded and fourth step is to analyse the situation and make presentation with the help of chart. She also explained that this is done in farmers' fields with farmers so that farmers are empowered to take all observations, analyze the situation and take their own decisions of managing of pests and diseases say whether they have to apply any pesticide or not. If the level of insect pest is high, first they have to go in for bio control agents to manage, and if it is not possible to control, as a last resort she told to use chemical pesticides. Dr. Narsi Reddy, divided executives into 4 groups, each group went to field recorded

observations on soil condition, weather conditions like sunshine, temperature, crop status, number of leaves, plant height, number of fruits, insects present through sweeping nets, including pests and defenders, diseases, abiotic symptoms like deficiency, wilting due to starvation due to water or root rots. The first group went to tomato field, identified pests, disease, predators, etc. and given presentation many of the fruits were fallen, which rotted, this rotting led to smell and unhygienic condition. They also recorded beneficial as well as pests on tomato. The weather was hot sunny day. The second group went to rice field, took observations on 10 plants averaged and presented figure of plant height, number of tillers, number of leaves, pests and predators including dragon fly and damsel fly. Dragon fly had erect wings at right angel to the body, while damsel fly has humped wings. The third group was on groundnut, the crop was healthy, and they recorded pests and predators. The number of insect pests was less, the crop was healthy. They recorded observations on insect pests and predators etc and the crop stage. The fourth group was on brinjal where in some portion of the field was mulched with polythene sheet, which harbored lot of moisture and encouraged rotting of plants and bacterial infections with foul smell was also observed, while luxuriant growth of crop with abundant fruits well distributed in non-plastic mulched areas, where there was good aeration, plant growth was also good, with more fruits. The soil was sandy loam. They took observations on 8 plants and average was presented by each group using charts and live samples.

Day 13: 15.03.2018

Presentations on Group Tasks:

On the first day of training program, Dr. Sreenivasa Rao explained about the importance of group tasks, and the topics were shared. All the participants were given choice to select topic of their interest among shortlisted four topics, and were allotted to Mentors based on their selected topics. The group members worked on the topics every day spending at least half-an-hour to one hour, including practical experiences. Accordingly, the work done report reports are presented by each group. All other members interacted with the team members, and questions and queries are also addressed and answered. It was a very lively day and thoughts were shared by each member.

S.No	Group Tasks	Mentors	Group Members
1	Surveillance Methods	Gupta CS	Copper field, Ghana Nasrat from Afghanistan, Moris, Kenya, Kasibgo, Malavi Basir, Afghanistan
2	Fruit fly lure preparation & trapping	Mariadoss A	Gertrude Badaru, Uganda, Bismillah, Afghanistan Kabo, Botswana.
3	Responsible Use of Pesticides	Ms. Sridevi T	Peter K. Ng'ang'a , Kenya, George Oprah, Ghana, Bernice Oretha , artoe, Liberia, Win Win Khaing of Myanmar, Khalil, Sudan Sulimam Sudan, Benedict Ssekyanzi of UGANDA, Tshianz-A-K.Michel of DRC.
4	Methods for removal of Pesticide Residues in Fruits and Vegetables	Dr. Nirmali Saikia	Juliet Mutindi Mulei (Kenya), Adi Okutu (Ghana), Francis Okumu Sande (Uganda), Marie Mwinziya (DRC), Eman Ali Sawi (Sudan),

			Wine Nandar Kyaw (Myanmar), Mr. Julius Koko Kossigba, Chikoma Miriam Madalitso.

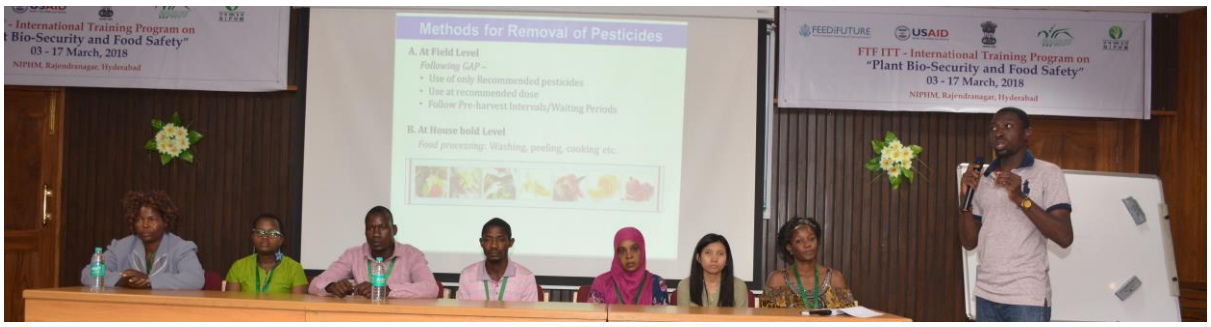
Fruit fly lure preparation & trapping

The Group Members were Ms. Gertrude Badaru, Uganda, Mr. Basir, Afghanistan and Mr. Kabo, Botswana. Gerrtrude informed that Fruit flies are found in Temperate, Tropical and Sub-Tropical Regions of the world, they are Polyphagous, Multivoltine i.e. multiple generations per year, Difficult to eradicate, and Economic losses vary from 80-90%, Major constraint in International Market Access. The following lures will be prepared to trap and control them viz., Methyl eugenol (*Bactrocera spp*.), Cue lure (*Bactrocera spp.)* , Latilure *(B. latifrons)* , Trimed lure / Capilure (*Ceratitis spp.)* , 2 component lures (*Anastrepha spp.)* , Ammonia emanating baits *(Rhagoletis spp.)* No lure found for some fruit flies. Food baits with proteinous material may attract male and female flies.

Methods for removal of Pesticide Residues in Fruits and Vegetables

The second group presented removal of pesticides in the food. This group was led by Ms. Juliet Mutindi Mulei (Kenya), Mr. Adi Okutu (Ghana), Mr. Francis Okumu Sande (Uganda), Mrs. Marie Mwilabwe Mwinziya Marguerite (DRC), Ms. Eman Ali Sawi (Sudan), Ms. Wine Nandar Kyaw (Myanmar), Mr. Julius Koko Kossigba, Ms. Chikoma Miriam Madalitso. Mr. Adi presented the group task and informed that pesticides are Toxic, so as the residues, The amounts of residues found in food must be safe for consumers and must be as low as possible. Pesticides or their breakdown products remaining in the environment following their normal use or accidental contamination is called pesticide residue. They are the very small amounts of pesticides that can remain in the crop after harvesting or storage and make up their way into the food chain. Methods of removal of pesticides in the field level includes Use of only Recommended

pesticides, Use at recommended dose, Follow Pre-harvest Intervals/Waiting Periods, while in the hose hold level pesticides are removed from the food products by Food processing viz., Washing, peeling, cooking etc.

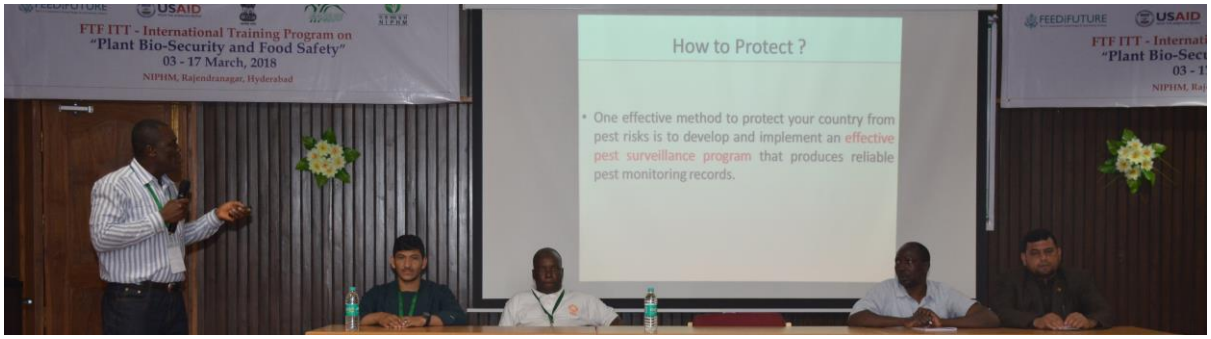


Responsible Use of Pesticides

The third group presented responsible use of pesticides by Dr. Peter K. Ng'ang'a , KENYA, with following six members viz., Mr. George Oprah, GHANA, Ms Bernice Oretha , artoe, LIBERIA, Ms Win Win Khaing of MYANMAR, Mr.Khalil M. Sulimam from SUDAN, Mr. Benedict Ssekyanzi of UGANDA, Mr.Tshianz-A-K.Michel of DRC. Their Mentor was Ms. Sridevi of NIPHM. Dr. Peter gave Brief on pesticide, how to Handle Pesticides with care, Responsible Use of Pesticides, Integrated Pest Management, Pesticide Label Information including Trade, brand, or product names, Ingredient statement, Use classification statement, Name and address of manufacturer, Registration number, Signal words and symbols, Precautionary statements, Statement of practical treatment, Antidotes for pesticide poisoning, Environmental hazards, Physical or chemical hazards, Restricted entry interval (REI), Storage and disposal, Directions for use. He felt that based on correct use of appropriate pesticide in an ecologically compatible manner so as to reap maximum benefits by achieving cost effective pest management without harming the environment and non-target species.

Surveillance Methods

This group had five members led by Copper field and Mr. Ansari from Afghanistan, Moris from Kenya, Kasibgo from Malavi and Basit from Afghanistan. The group mentor was Dr. Guptha. Mr. Copperfield the team leader explained that different countries design biosecurity systems to protect their animal, plant, and environmental resources from invasive alien species. Countries maintain biosecurity systems to safely manage trade and prevent the introduction of invasive pests (insects, diseases and weeds) through numerous pathways of entry. One effective method to protect your country from pest risks is to develop and implement an effective pest surveillance program that produces reliable pest monitoring records. Different traps are being used *viz*., Beetle Traps - In general, beetle traps are fairly targeted in the types of beetles they trap and are designed to attach to the host material directly or in close proximity to the host material, Fruit Flies traps, which traps are fairly targeted in the types of fruit flies they trap and are designed to attach to the host material directly or in close proximity to the host material *viz*., Jackson trap, Mcphail trap, Multilure trap etc. Pheromone traps for two insects *viz*., *Chilo* and *Sesamia* @ 2/fixed field have to be installed. Set up of light traps @ 1 trap/acre 15 cm above the crop canopy for monitoring and mass trapping of insects. Set up yellow pan water trap/sticky traps 15 cm above the canopy for monitoring whitefly and blue sticky trap for thrips @ 4-5 traps/acre.



In the afternoon, all the participants were asked to present their back to work plan in their respective countries after going back. All the participants gave their detailed back to work plan to be done within 6 months to 2 years.

Back-at-work plan is presented in Annexure-IV.

Day 14: 16.03.2018

A post course evaluation was taken up in the forenoon by the coordinators followed by back to work presentation. A visit was organized to Indian Institute of Oilseeds Research, Rajendranagar, Hyderabad in the afternoon for one hour.

Valedictory Session:

In the evening at 4.00 PM, valedictory function was arranged and the certificates were distributed to all the delegates, followed by Cultural Programme. In the valedictory programme, the chief guest was Dr. WR Reddy, Director General, NIRD, Hyderabad. Smt Usha Rani, Director General NIPHM and MANAGE presided over the function. Dr. Cherukuri Sreenivasa Rao, Director, PMD, NIPHM informed that this is the second such programme taken up by NIPHM for 15 days from 3-17 march 2018. He gave the brief of design of courses methodology of training, which included lecture classes(20%), hands on training (60%) in the fields followed by visits to various National and international institutes (20%) like ICRISAT, IIOR. He informed that there were 23 participants (15 males and 8 females) attended the program from 10 different countries of Asia and Africa. The candidates were evaluated before taking up the course (pre course evaluation) and at the end post course evaluation was done. There was increase in knowledge by 35-60%, and the overall rating for program is 9.63/10.

Ms. Gertrude, District Agricultural Officer of Uganda gave her feedback about the program. While thanking the God for having given the opportunity to come over here, she felt that more emphasis was given to practical's than theory, methodology was good. She felt that NIPHM had talented scientific staff with latest state of art modern laboratories and with this she felt that India is now a developed country but cannot be considered as developing country. She informed that African soils are rich, but are not being exploited fully. She learned lot of new techniques in this programme like luring fruit flies, the major problem in Africa, similarly handling of pesticides, removal of pesticide contamination etc. including plant bio security Act. Dr. Peter from Kenya informed that this training is highly useful and this will be formed as a curriculum in 4 national colleges in Kenya. He acquired knowledge, skills which enhanced his leadership abilities. He appreciated the facilities of NIPHM including hospitality. Mr. Nasrat from Afghanistan appreciated the training programme, design, scientific content, etc and thanked the Govt. of India and Afghan Governments for giving permission

Smt. Usha Rani, welcoming the Chief Guest Dr. WR Reddy, briefly explained about the main objectives of the program, and she expressed happiness over the program results and satisfaction of all executives on meeting the expectations. Smt Usha Rani also congratulated the Course Directors, Course Coordinators, and all the technical and administrative staff who made this very successful.

Dr. WR Reddy, IAS, Director General, National Institute of Rural Development, Rajendranagar, Hyderabad was the chief guest, who gave an informative outlook on importance of plant bio security and food security which is gaining importance. He felt that agriculture has been over exploited. Although India is surplus in food production but still there is deficiency of nutrition security, people are not having purchasing power. FFT is an important programme to address the food security issues. Plant bio security is very important and vital for every nation. To say few important exotic weeds like *Parthenium* (congress weed) and *Phalaris minor* have already entered in India and created havoc in agricultural productions. In India organic agriculture is important and is picking up recently in view of safe foods. Cross learning is important and he felt that indiscriminate use of pesticides is causing lot of problems. We have to go for IPM and Agro Eco System Analysis and groom farmers in this direction. In India, organic agriculture is picking up as consumers are looking for safe food. All the participants are therefore requested to use minimum pesticides, bio control agents and follow strict quarantine regulations to prevent entry of invasive alien species. Each country has to follow Pest Risk Analysis (Pest Risk Analysis) so that plant biosecurity can be strengthened. This programme enabled cross learning from different countries. The

knowledge learnt from this programme should be utilized in your respective countries as back to work plan.

Dr. Alice R.P. Sujeetha, Director, Plant Bio-security Division proposed vote of thanks to all the dignitaries on the Dias, Dr. WR. Reddy, DG, NIRD, Smt. Usha Rani, Director General NIPHM, Dr. Ch.Sreenivasa Rao, off the dias *viz*., Executive trainees, all the staff members of Manage and NIPHM. She also thanked the Government of India for giving the permission to conduct this meeting. She also thanked all the ten Governments of Africa and Asia for sending the participants to India for undergoing 15 day training programme on plant bio security and food safety.

Day 15: 17.03.2018

The executives were taken to NBPGR and Farmers Call Centre, and interacted with Dr. Anita of NBPGR on various issues pertaining to Post Entry Quarantine and activities of NBPGR. An interactive session was conducted with Call Centre Executives to understand the way of functioning of farmers call center and queries etc.

Dr. Ch. Sreenivasa Rao and Dr. Alice J Sujeetha interacted with executives to understand requirements for back-at-work-plan and bid farewell to all wishing them a happy journey back to home.

3. TRAINING EVALUATION

3.1 Evaluation of Technical sessions

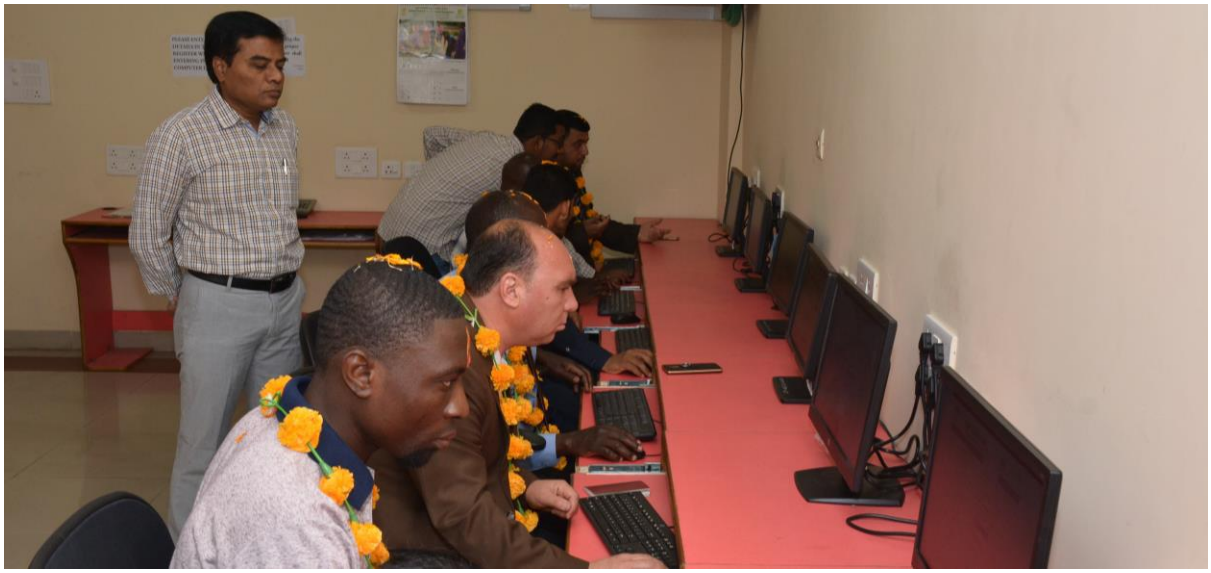
Feedback of Executives was collected on all technical sessions taken by resources persons, and field visits on a scale of 0 to10 *i.e.* '1 being the least and 10 being highest. In addition, their suggestions on other areas such as boarding and lodging were obtained in order to bring necessary changes. The executives expressed their satisfaction level by rating the program on an average score of 9.63 on a 10 point continuum indicating the overall impression on the program was excellent.

The feedbacks received from executives are tabulated Annexure-V.

3.2 Pre and post-training test

Pre and Post Training test were conducted for the executives at the beginning and at the end of the training respectively. Twenty Five thematic questions on Plant Biosecurity and Food Safety with a maximum of 25 marks were administered for pre and post-training test and obtained answers of the executives to assess their change of knowledge levels and effectiveness of the training programme. The average score of executives in the pre-training test was 11.30, whereas the average score of post-training was 17.65. Thus, it was found that the level of knowledge of executives was increased by 25.40 percent after the training programme.

Details of pre and post-training test are given at Annexure-VI.



3.3 Evaluation

Executives rated the overall training program with a score of 9.63 on 10 point continuum *i.e.* Excellent.

3.4 Post-training monitoring

Post-training impact evaluation in respective countries by NIPHM and Program Management Unit (PMU) is an integral part of the programme. PMU will be regularly in touch with executives through emails to monitor the progress of their "Back-at-Work-Plans" and it will help in effective monitoring and impact evaluation which is one of the important aspects of Program Monitoring & Evaluation (M & E).

4. VALEDICTORY AND FEED BACK

4.1. Feed Back:

Feedback information was received from the executives about the training programme.

4.2. Valedictory

Valedictory session was conducted on 16th March, 2018, The valedictory session was attended by Guest of Honour Dr.W.R.Reddy, IAS, Director General, NIRD&PR and Smt V. Usha Rani, IAS Director General, MANAGE and NIPHM. Dr. P. Chandra Shekara Program Director, MANAGE, Dr. Cherukuri Sreenivasa Rao, Director (Pesticide Management and Plant Health Management) and Dr.J.Alice R.P.Sujeetha, Director (PB), NIPHM were present. A consolidated program report of "FTF-ITT" was given by Dr. Cherukuri Sreenivasa Rao, Course Director. The executives gave their valuable feedback on the training program, which was followed by the opening remarks by the Director General, NIPHM. The valedictory address was delivered by chief guest Dr. W.R.Reddy, IAS Director General, NIRD&PR, Hyderabad. Certificates were distributed to the participants by the guests. Vote of thanks was delivered by Dr. J. Alice R.P.Sujeetha, Director (PB), NIPHM.

ANNEXURE-I

PROGRAM SCHEDULE
FFED THE FUTURE-INDIA TRIANGULAR TRAINING
(FTF-ITT)
03-17 MARCH 2018
PLANT BIOSECURITY & FOOD SAFETY
NATIONAL INSTITUTE OF PLANT HEALTH MANAGEMENT

Day-1 : 3rd March 2018 (Saturday)			
09.30-10.30	Registration		Dr. Nirmali Saikia Ms. Sridevi T Dr. Jyothi Bharadwaj
10.30-11.15	Pre-Course Evaluation		Dr. Girish AG Dr. Nirmali Saikia Mr. Liyakhat Ali Ahamed Dr. CS Gupta
11.15-11.30	Tea Break		
11.30-13.00	General Information and Instructions Expectations from Participants Medical, Legal, Administrative & Financial Formalities		NIPHM and MANAGE
13.00-14.00	Lunch Break		
14.00-17.30 *Institutional Lab Visits*	**Group-A**	**Group-B**	**Facilitators**
	• Biological Control Laboratory *(Parasitoids, Predators & Microbials)*	• Plant Health Diagnosis Lab • Nematology Lab	Dr. Sreelatha E Dr. Jyothi Bharadwaj
Day-2 : 4th March 2018 (Sunday)			
09.00-18.00	Visit to Places of Historical Importance		Mr. Liyakhat Ali Ahamed Dr. Sakthivel P Mr. Om Pal Singh
Day-3 : 5th March 2018 (Monday)			
09.00-09.30	Greeting, Meeting & Briefing		Dr. Ch. Sreenivasa Rao
09.30-11.00	Inauguration		Ms. I. Rani Kumudini, IAS Chief Executive, NFDC Smt. V. Usha Rani, IAS Director General, NIPHM & MANAGE Course Directors, NIPHM
11.00-11.15	Tea Break		
11.15-13.00	General Guidelines on Course Outlines, Group Tasks, Back to Work Plans and Expectations from Participants		Dr. Sreenivasa Rao Ch Dr. J. Alice. R.P. Sujeetha Course Directors
13.00-14.00	Lunch Break		

	Group-B	Group-A	Facilitators
14.00-16.00 *Institutional Lab Visits*	• Biological Control Laboratory *(Parasitoids, Predators & Microbials)*	• Plant Health Diagnosis Lab • Nematology Lab	Dr. Sreelatha E Dr. Jyothi Bharadwaj
16.00-16.15	Tea Break		
16.15-17.30	**Assigning Group Tasks** • Surveillance Methods *(Gupta CS)* • Fruit fly lure preparation & trapping *(Mariadoss A)* • Responsible Use of Pesticides *(Ms. Sridevi T)* • Methods for removal of Pesticide Residues in Fruits and Vegetables *(Dr. Nirmali Saikia)*		Dr. Sreenivasa Rao Ch Dr. J. Alice. R.P. Sujeetha
Day-4 : 6th March 2018 (Tuesday)			
09.00-09.30	Recap		Dr. J. Alice. R.P. Sujeetha
09.30-11.00	WTO-SPS Agreement vis-à-vis Plant and Food Safety - *Theory*		Dr. Ch. Sreenivasa Rao
11.00-11.15	Tea Break		
11.15-13.00	Concept of Plant Bio-Security and Issues - *Theory*		Dr. J. Alice. R.P. Sujeetha
13.00-14.00	Lunch Break		
14.00-15.30	Inspection & Sampling Procedures for export and import of Agricultural Commodities - *Theory*		Dr. Sanjay Arya DPPQ&S, GOI
15.30-15.45	Tea Break		
15.45-17.00	Fruit fly Identification and Lure Preparation – *Practical Exercise & Field Visits*		Mr. Mariadoss A
17.00-17.30	Group Tasks		All Coordinators
Day-5 : 7th March 2018 (Wednesday)			
09.00-09.30	Recap		Mr. Mariadoss A
09.30-13.00	Pest Surveillance and Surveillance Methodologies - *Theory, Practical Exercise & Field Visits*		Dr. Gupta CS
13.00-14.00	Lunch Break		
14.00-17.00	Vermicomposting *Theory, Practical Exercise & Field Visits*		Dr. Shaktivel
17.00-17.30	Group Tasks		All Coordinators
Day-6 : 8th March 2018 (Thursday)			
09.00-13.00	Visit to Rural Technology Park (RTP) of National Institute of Rural Development and Panchayati Raj (NIRD&PR)		Dr. Sreenivasa Rao Ch Dr. Shaktivel
13.00-14.00	Lunch at MANAGE		
14.00-17.00	Visit to MANAGE Orientation about MANAGE Sessions on Back at Work Plan		Interactions with Director General and Senior Staff of MANAGE

17.00-17.30	Group Tasks		All Coordinators
Day-7 : 9th March 2018 (Friday)			
09.00-13.00	*Visit* to International Crop Research Institute for Semi-Arid Tropics (ICRISAT)		Dr. J. Alice. R.P. Sujeetha Dr. Girish AG
13.00-14.00	Lunch at ICRISAT		
14.00-17.30	*Visit* to Pomegranate Export Unit – Cold Treatment (Phytosanitary treatment)		
Day-8 : 10th March 2018 (Saturday)			
09.00-09.30	Recap		Dr. J. Alice. R.P. Sujeetha
09.30-13.00	Overview of Phytosanitary Measures – *Practical Exercise*		Dr. Girish AG
13.00-14.00	Lunch Break		
14.00-17.00	Quarantine Pest Detection & Identification (Insects) - *Practical Exercise*		Mr. Mariadoss
	Quarantine Pest Detection & Identification (Pathogens) - *Practical Exercise*		Ms. Madhubala R
17.00-17.30	Group Tasks		All Coordinators
Day-9 : 11th March 2018 (Sunday)			
09.00-18.00	Visit to Places of Cultural Importance		Mr. Liyakhat Ali Ahamed Dr. Sakthivel P
Day-10: 12th March 2018 (Monday)			
09.00-09.30	Recap		Dr. Sreenivasa Rao Ch
09.30-11.00	Regulations for Quality Control of Pesticides		Dr. Sreenivasa Rao Ch
11.00-11.15	Tea Break		
Institutional Lab Visits	Group A	Group B	Dr. OP Sharma Er. Udaya Bhanu
11.15-12.10	PHE Workshop	Bio-Fertilizer Lab	
12.10-13.00	Bio-Fertilizer Lab	PHE Workshop	
13.00-14.00	Lunch Break		
14.00-17.00	Pesticide Quality Control Lab		Mr. CV Rao
	Safe use of Pesticides-*Practical Exercise*		Dr. Jaya Devi M
17.00-17.30	Group Tasks		All Coordinators
Day-11: 13th March 2018 (Tuesday)			
09.00-09.30	Recap		Dr. Sreenivasa Rao Ch
09.30-11.00	Pesticide Residues in Food Commodities vis-à-vis Food Safety Regulations		Dr. Sreenivasa Rao Ch
11.00-11.15	Tea Break		
11.15-13.00	Food Safety Testing (Pesticide Residue Analysis) Laboratory		Ms. Sridevi T
	Pesticide Residue Analysis – *Practical*		Dr. Baby Rani
13.00-14.00	Lunch		
14.00-17.00	Practices (Field) for reduction of Pesticide Residues in Foods – *Practical Exercise*		Dr. Nirmali
	Practices (Household) for reduction of Pesticide Residues in Foods – *Practical Exercise*		Ms. Sridevi
17.00-18.00	Group Tasks		All Coordinators

Day-12: 14th March 2018 (Wednesday)		
09.00-09.30	Recap	Dr. Ch. Sreenivasa Rao
09.30-13.00	Concept of Agro Ecosystem Analysis (AESA) for Plant Health Management – *Theory*	Dr. E. Sreelatha
	Concept of Agro Ecosystem Analysis (AESA) & Ecological Engineering based Plant Health Management – *Practicals*	Dr. Narsi Reddy
13.00-14.00	Lunch Break	
14.00-15.15	Mass production of *Pseudomonas* and *Trichoderma – Lab Visit & Practical Exercise*	Dr. Bindu Madhavi G
15.15-16.30	Mass Production of Bio-Fertilizers – *Lab Visit & Practical Exercise*	Dr. OP Sharma & Dr. Ramesh
16.30-18.00	Preparation of Presentations	All Coordinators
Day-13: 15th March 2018 (Thursday)		
09.00-11.15	Group Assignments Presentations *(15 minutes per group)*	The Director General Directors & other Staff
11.15-11.30	Tea Break	
11.30-13.00	Back to Work Plan Presentations *(5 minutes per officer)*	The Director General Directors & other Staff
13.00-14.00	Lunch Break	
14.00-18.00	*Contd..*Back to Work Plan Presentations *(5 minutes per officer)*	The Director General Directors & other Staff
Day-14: 16th March 2018 (Friday)		
09.00-09.30	Recap	
09.30-11.15	Post-Course Evaluation & Feed Back	Dr. Girish AG Dr. Nirmali Saikia Mr. Liyakhat Ali Ahamed
11.15-11.30	Tea Break	
11.30-13.00	Visit to Indian Institute of Oilseeds Research (IIOR)	Shri. A. Mariadoss Dr. CS Gupta
13.00-14.00	Lunch Break	
14.00-15.30	Interactions with Coordinators	
15.30-15.45	Tea Brea	
16.00-17.00	Valedictory & Certificate Distribution	Dr. W.R. Reddy, IAS Director General, NIRD&PR Smt. V. Usha Rani, IAS Director General, NIPHM & MANAGE Course Directors, NIPHM
18.00-20.00	Cultural Evening	
Day-15: 17th March 2018 (Saturday)		
09.00-13.00	Visit to National Bureau of Plant Genetic Resources (NBPGR) and Kisan Call Centre	Dr. Ch. Sreenivasa Rao Sri. Mariadoss
13.00-14.00	Lunch Break	
14.00-16.00	Orientation of Back to Work Plans and See off	Dr. Sreenivasa Rao Ch Dr. J. Alice. R.P. Sujeetha

ANNEXURE II

LIST OF EXECUTIVES

	**Mr. Samiullah Nasrat** Agriculture Extension Manager Directorate of Agriculture, Irrigation and Livestock, Khost, Afghanistan Tel: 0799531261/0774054591/93- 70 677 227 3 Email: snasrat_0093@yahoo.com
	**Mr. Basir Ahmad Tabib** Plant protection Manager Directorate of Agriculture, Irrigation and Livestock, Herat Afghanistan Tel: +93-785 383 607 Email: basir_tabib@yahoo.com
	**Mr. Bismillah Zahid** Plant Protection Manager Directorate of Agriculture, Irrigation and Livestock, Helmand, Afghanistan Tel: +93- 703951950 Email: bismllah.zahid@gmail.com
	**Mr.Kabo Kapaletswe** Agricultural Scientific Officer/Plant Protection Officer Ministry of Agricultural Development and Food Security /Crop Protection Private Bag 32, Kanye Botswana Tel: +267 544 0346/ +26771849164 Emai: kkepaletswe@gov.bw , kpltswek@gmail.com
	**Ms. Marie Mwilabwe Mwinziya Marguerite** General Administrator PERCEE SARL 329, Kajama Avenue Q/ Bhaishara C/Dilala Kolwezi Lualaba Democratic Republic of Congo Tel: 243 82 4443414 Email: percee.ziya@gmail.com

	**Mr. Tshianz-A-Kangasa Michel** General Administrator New A.G. TEC Sarl 217, Avenue Butembo , Q, Mutoshi C/Manika Ville De Kolwezi, Democratic Republic of Congo Tel: 243997026404, 243811851000 Email: newagtec2@gmail.com , newagtecsprl@yahoo.f
	**Mr. Adi Okutu** Assistant Agriculture Officer Ministry of Food and Agriculture, Plant Protection & Regulatory Services Directorate Pokuase-Accra, Ghana Tel: 0275713378, 0275 713 378 Email: addiofficial001@gmail.com
	**Mr. George Prah** Deputy Director Ministry of Food and Agriculture- Directorate of Crop Services Accra, Ghana Tel: 0244897314, Email: gpdirector@yahoo.com
	**Mr. Copperfield Kwami Banini** Deputy Director Ministry of Food and Agriculture, Plant Protection & Regulatory Services Directorate Pokuase-Accra, Ghana Tel: 0243108140 Email: copperbanini@yahoo.com
	**Ms. Juliet Mutindi Mulei** Laboratory Technologist Kenya Plant Health Inspectorate Service/ Analytical Chemistry Laboratory Kenya Tel: +254 720 315893, +254729787542 Email: jmulei@kephis.org , omwaniki@kephis.org

	**Mr. Maurice Ouma Onyango** Principal Fisheries Officer Ministry of Agriculture, Livestock and Fisheries, State Department of Fisheries and the Blue Economy, Kenya Tel: +254 727 776 900 Email: mauriceouma8845@gmail.com
	**Mr. Peter Kibue Ng'ang'a** Chief Veterinary Officer/ Senior Lecturer Ministry of Agriculture, Livestock and Fisheries, State Department of Livestock / Training Division, Kenya Tel: +254715367882, +254722807985 Email: ahitikabete@gmail.com
	**Ms. Bernice Oretha Kartoe** Technician Republic of Liberia Ministry of Agriculture P.O.Box 10-9010 1000 Monrovia 10, Liberia Tel: +231 886882549, +231770117525 Email: bkartoe2013@gmail.com
	**Mr.Julius Koko Kossigba** Technician KAVTC Klay Bomi COUNTY, Liberia Tel: 231778220750 Email: wdickson1980@gmail.com
	**Mr. Elia Kazinga** Agriculture Extension Development coordinator(AEDC) Ministry of Agriculture /Extension SA DAO, BOX 491 ,SALIMA, Malawi Tel: +251(0)888573173, 991033488, 994482283 Email: kazingaelia@gmail.com

	**Ms. Chikoma Miriam Madalisto** Agriculture Extension Development Officer, Agriculture Extension Services, Department of Agricultural Extension Services, P.O.Box.30145, Lilongwe-3, Malawi Tel: +265 999398880, 885836401, +265 999226261 / 884221605(Supervisor) Email: chikomirie@yahoo.co.uk, ezidana@gmail.com
	**Ms. Waing Nandar Kyaw** Junior Research Assistant Plant Pathology Research Section, Department of Agricultural Research (DAR) D-40, Cherry Myaing Street, Department of Research, Yezin, Nay Pyi Taw, Myanmar Tel: +95-67-416531,+959797679259 Email: dgdar.moai@gmail.com , waingnandarkyaw@gmail.com
	**Ms. Win Win Khaing** Senior Research Assistant Plant Pathology Research Section, Department of Agricultural Research (DAR) D-21, Staff Housing, University of Veterinary, Yezin, Nay Pyi Taw, Myanmar Tel: +95-67-416531, +95943132713, +959420740818 Emai:dgdar.moai@gmail.com, winwinkhaingyau@gmail.com
	**Ms. Eman Ali Sawi** Quality Control Officer Ministry of Agriculture and Forestry Quality Control and Export Development Administration Algamaa Street, Sudan Tel: +249183774688, +249123821656 Email: moafscqu@yahoo.com , emansawi12@gmail.com
	**Mr. Khalil Mohamedelmahdi Suliman** Quality Control Officer Ministry of Agriculture and Forestry Quality Control and Export Development Administration Algamaa Street, Sudan Tel: +249183774688, +249912433812, +249123433812 Email: khalilo707@gmail.com , moafsqcu@yahoo.com

	**Mr. Francis Okumu Sande** Assistant Agricultural Officer P.O.Box 124, Busitema Sub County, Busia District, Uganda Tel: +256 787760336, +256 784956580 Email: sandeokumu@gmail.com
	**Ms. Gertrude Badaru** District Agricultural Officer Arua District Local Government P.O.Box 1, Arua, Uganda Tel: 0256 772636778, +256 77653387 Email: victortoa2005@yahoo.co.uk , gertrude_bad@yahoo.com
	**Mr. Benedict Ssekyanzi** Principal Agricultural Officer Kiboga District Local Government, Production Department, P.O Box No 1, Kiboga , Uganda Tel:+256772697883, +256782245570 Email: ssekyanzibenedict@gmail.com

ANNEXURE III
COMMITTEE MEMBERS

Committee Chair

Smt. V. Usha Rani, I.A.S
Director General, NIPHM
Email: dgniphm@nic.in

Course Directors	
Dr. Ch. Sreenivasa Rao Director (Pesticide Management) Tel: 040-24010106 Mob: +91 9441026576 Email: dirpmniphm-ap@nic.in	**Dr. J. Alice R.P. Sujeetha** Director (Plant Bio-Security) Tel: 040- 24018788 Mob: +91 9652604400 Email: dirpqpniphm-ap@nic.in
Course Coordinators	
Dr. Girish A.G. Assistant Director Mob: +91 8978778704 Email: girishpql@gmail.com	**Dr. Nirmali Saikia** Assistant Director Mob: +91 8008260926 Email:adpmraniphm-ap@nic.in
Help line contacts	
Smt. D. Chanchala Devi Registrar Mob: +91 9490957067 Email: registrarniphm@nic.in	**Shri. Nalla Venkata Reddy** Administra ve Officer Mob: +919849268414 Email: aoniphm-ap@nic.in
Emergency contacts	
Shri. Mariadoss. A Assistant Director Mob: +91 9100207342 Email: adrpmniphm-ap@nic.in	**Dr. Chandra Shekhar Gupta** Assistant Scien fic Officer (PP) Mob: +91 8978778719 Email: asoppniphm2-ap@nic.in
Hostel contact	**Finance contact**
Shri. Shaik Liyakhat Ali Ahamed Assistant Director & Warden Mob: +91 7702641155 Email: adict-niphmhyd@gov.in	**Shri. K. Jeethender** Assistant Finance & Accounts Officer Mob: +91 9030080287 Email: faniphm-ap@nic.in

ANNEXURE IV

BACK-AT-WORK-PLAN

<table>
<tr><td colspan="2">**Mr. Samiullah Nasrat**
Agriculture Extension Manager
Directorate of Agriculture, Irrigation and Livestock, Khost, Afghanistan
Tel: 0799531261/0774054591/93- 70 677 227 3 Email: snasrat_0093@yahoo.com</td><td>  </td></tr>
<tr><td>**Name of the Activity**</td><td colspan="2">**Responsible use of Pesticides in vegetable and fruit production**</td></tr>
<tr><td>**Problem in your service area**</td><td colspan="2">There have reported cases and notifications of harmful organisms (trips, False codling Moth) in the Agro produce exported to the other country in recent times. As a result of this incident, farmers are indiscriminately using chemical pesticides to be able to produce clean produce to this lucrative market.
In view of this, most water bodies are being polluted as aquatic life is being lost on daily basis, there are pesticide residues left in these produce as confirmed by the Food and Drugs Authority (FDA), much more pesticide contaminated cases are reported in the clinics and hospitals in these farming communities.</td></tr>
<tr><td>**Indian Experience/ Solution/ Innovation**</td><td colspan="2">**Indian experience** has demonstrated that chemical pesticides are not the panacea to the pest problems farmers have in their crop production. Integrated Pest Management (IPM) are being employed by the farmers which enabled farmers to reduce the excessive and indiscriminate use of chemical pesticides. Bio pesticides alongside Good Agronomic Practices (GAPs) are used to manage the pests in the farms. Local and less cost effective methods of pest management are being employed as alternatives.</td></tr>
</table>

Place	Khost province Afghanistan-
Target Groups	All - urban Vegetable and fruit Farmer Groups, individual vegetable farmers and Extension workers. • Exporters of Agro-based produce
Duration	The programmed will run for six (6) month and quarterly reporting to MANAGE/NIPHM and MAIL.
Expected end results	252 Farmers and 30 Extension Officers are expected to be trained and monitored during the period. It is also expected that this training would enable them adopt the use of bio pesticides, IPM and GAPs as their main pest management strategies reduce pesticide residue levels to enable us protect the environment. • 20 Quarantine Officers trained on fumigation • 75% of Exporters sensitized and trained on fumigation of commodities.
Any other information	Establishment of Vermicomposting for personal use in the garden and three type chemical (Ethyl alcol, methyl eugenol and malathion solution.

<table>
<tr><td colspan="2">**Mr. Basir Ahmad Tabib**
Plant protection Manager
Directorate of Agriculture, Irrigation and Livestock, Herat
Afghanistan
Tel: +93-785 383 607
Email: basir_tabib@yahoo.com</td><td>  </td></tr>
<tr><td>**Name of the Activity**</td><td colspan="2">**FRUIT FLY LURE PREPARATION AND TRAPPING**</td></tr>
<tr><td>**Problem in your service area**</td><td colspan="2">**Devastating problem of fruit fly in the peach garden**</td></tr>
<tr><td>**Indian Experience/ Solution/ Innovation**</td><td colspan="2">**Indian experience** shows that fruit fly is responsible for up to 90-100% loss in fruits and vegetables. Fruit flies are also major problem for export of fresh fruits and melon. Control of Fruit flies using pesticide as spraying is very costly and not safe to the consumers and environment.
As solution farmers in India have demonstrated on a simple and low cost practice of trapping male fruit flies to reduce fertilization in female fruit fly which is mostly responsible for damaging the fruits like melon and vegetables.
Innovation is that simple and cost effective Fruit fly pheromone traps were locally developed by using water bottles to trap the male fruit flies. Then sex Pheromones such as methyl Eugenol lure (ME lure) and CUE lure can be prepared for effectively control of **fruit fly** in fruit like **melon** and **vegetable fields.**</td></tr>
<tr><td>**Place**</td><td colspan="2">**HERAT PROVINCE, AFGHANISTAN**</td></tr>
<tr><td>**Target Groups**</td><td colspan="2">• Fruit Farmer Group who have already established fruit gardens and those who have interest in growing fruits and vegetables
• Farming groups, extension workers, leading farmers and the cooperative farmer members</td></tr>
<tr><td>**Duration**</td><td colspan="2">**Six (6)** month report sub mission to both **MANAGE** and</td></tr>
</table>

	Local Government, then after continuously guiding farmers and those who have interest for growing fruit on commercial purpose and export.
Expected end results	Many farmers will be able to adopt the low cost simple technique of preparation of fruit fly lure and locally available traps to reduce male fruit fly population and increase fruit production and fruit quality for better local and international market. Also we should prepare the **national strategy** for fruit fly in over country and **(Mail-PPGD)** and preparing the lure is important think over **(Mail)** should import the lure from **India.**
Any other information	Fruit farmers are able to increase fruit production to feed the upcoming factories in the region. Establishment of simple **Plant Clinic and Plant Laboratory** in the District for training farmers in the preparation of fruit fly lure and local traps. Also a **strategy of 5** years planning for fruit fly should be made.

Mr. Bismillah Zahid
Plant Protection Manager
Directorate of Agriculture,
Irrigation and Livestock, Helmand, Afghanistan
Tel: +93- 703951950
Email: bismllahzahid@gmail.com

Name of the Activity	**FRUIT FLY LURE PREPARATION AND TRAPPING**
Problem in your service area	Fruit fly is main problem in Helmand Province
Indian Experience/ Solution/ Innovation	**Indian experience**-both Fruit flies are also major problem for export of fresh fruits. Control of Fruit flies using pesticide as spraying is very costly for farmer to prevent damage in fruits and vegetables.
Place	Helmand province, Afghanistan.
Target Groups	Farmers and extension workers
Duration	Six (6) month report submission to MANAGE in India
Expected end results	Many farmers will be able to adopt the low cost simple technique of preparation of fruit fly lure and locally available traps to reduce male fruit fly population and increase fruit production and fruit quality for better local and international market.
Any other information	Fruit farmers are able to increase fruit production And there knowledge about fruit fly especially in my province of Helmand of Afghanistan.

Mr.Kabo Kapaletswe
Agricultural Scientific Officer/Plant Protection Officer
Ministry of Agricultural Development and Food Security /Crop Protection Private Bag 32, Kanye Botswana
Tel: +267 544 0346/ +26771849164
Emai: kkepaletswe@gov.bw , kpltswek@gmail.com

Name of the Activity	**Suppression of Fruit fly populations using low cost pheromone traps in Ngwaketse Central Sub District, Kanye**
Problem in your service area	• Insufficient funds to procure readymade traps for farmers • Lack of effective and efficient alternative methods to control fruit fly at farm level • Low yields of fruits and vegetables due to fruit fly infestation
Indian Experience/ Solution/ Innovation	Production of low cost fruit fly pheromone traps
Place	Kanye and surrounding areas, Botswana
Target Groups	50 backyard gardens, 10 horticultural farmers, 1 orchard
Duration	1 year (01.04.2018-31.03.2019)
Expected end results	• Reduced fruit flies population by 31 March 2019 • Improved yields by 31 March 2019
Any other information	• Required resources like ME and CUE lure will be sourced from Ministry headquarters • Mass production of low cost traps will be done at district level

Ms. Marie Mwilabwe Mwinziya Marguerite
General Administrator PERCEE SARL 329,
Kajama Avenue Q/ Bhaishara C/Dilala Kolwezi Lualaba
Democratic Republic of Congo
Tel: 243 82 4443414
Email: percee.ziya@gmail.com

Name of the Activity	**Training for integrity biodiversity and food safety into business strategies**
Problem in your service area	Lack of training and update in integrity bio diversity and food safety into business strategies.
Indian Experience/ Solution/ Innovation	• Respect of universal rules • Food self sufficiency • Much research and analysis
Place	Lualaba province/ DRC
Target Groups	Farmers, growers and Government firms
Duration	Three years
Expected end results	• Bringing farmers to food sufficiency, food safety and export • Government to support farmers applying universal rules • Implementation of research center in cooperation with Indian government
Any other information	• DRC is a big country; we got big agricultural space, favorable climate and bio diversity of plants, species. • We need new technologies and training in cooperation with India NIPHM.

Mr. Tshianz-A-Kangasa Michel
General Administrator New A.G. TEC Sarl 217,
Avenue Butembo , Q, Mutoshi C/Manika Ville De Kolwezi,
Democratic Republic of Congo
Tel: 243997026404, 243811851000
Email: newagtec2@gmail.com, newagtecsprl@yahoo.fr

Name of the Activity	**Inappropriate research and analysis equipments**
Problem in your service area	Inappropriate research and analysis equipments
Indian Experience/ Solution/ Innovation	• Diversity of research centers and more concentration in agricultural activities • Worlds food exports and food conservation system • Lot of labs machines
Place	Lualaba province / DRC
Target Groups	• Farmers and growers • Government firms
Duration	Three years
Expected end results	• To be properly equipped to tally exploit in labs • Bringing knowledge food safety to farmers, growers • Government to support farmers • Conduct to companies
Any other information	• DRC is a big country we got big agricultural space, favorable climate, and bio diversity of plant and species • Need new technologies and more technologies

Mr. Adi Okutu
Assistant Agriculture Officer
Ministry of Food and Agriculture, Plant Protection &
Regulatory Services Directorate Pokuase-Accra, Ghana
Tel: 0275713378, 0275 713 378
Email: addiofficial001@gmail.com

Name of the Activity	**RESPONSIBLE USE OF PESTICIDES**
Problem in your service area	Indiscriminate use of pesticides that do not promote sustainable agriculture. As a result the environment including the crops are negatively affected.
Indian Experience/ Solution/ Innovation	The Indian experience has demonstrated that the use of chemical pesticides does not promote sustainable agriculture. Consequently, Integrated Pest Management is employed by the farmers and as a result the farmers reduce excessive and indiscriminate use of chemical pesticides. Biopesticides alongside Good Agronomic Practices (GAPs) are used to manage the pests in the farms. Local and less cost effective methods of pest management are being employed as alternatives. • Production (on-farm) and use of *Trichoderma harzianum* and *Pseudomonas fluorescens* as bioagents to protect crops against several soil and airborne plant pathogens • Production and use of Entomopathogenic Nematodes (insect disease causing or killing nematodes) as a a biological control of insect pest
Place	Ga West Municipal, Accra Ghana.
Target Groups	25 small holder farmers and AEA's
Duration	6 Months
Expected end results	• Small holder farmers sensitized on the effects of irresponsible pesticide use on the crops and the environment

	• Small holder farmers and AEA's introduced to bio control and the production of *Trichoderma harzianum* and *Pseudomonas fluorescens* • Small holder farmers and AEA's sensitized on Entomopathogenic Nematodes and thought on its production
Any other information	-

Mr. George Prah
Deputy Director
Ministry of Food and Agriculture- Directorate of Crop Services
Accra, Ghana
Tel: 0244897314,
Email: gpdirector@yahoo.com

Name of the Activity	**Responsible use of Pesticides**
Problem in your service area	Indiscriminate use of agrochemicals (eg. pesticides) among peri-urban vegetable producers
Indian Experience/ Solution/ Innovation	• Application of proven and proper technologies (e.g nozzle and role of science and spray). • Adoption of Integrated Pest Management Strategies. • Regular monitoring and review of strategies.
Place	Ashaiman / Weija / Dzorwulu
Target Groups	Peri-urban vegetable farmers
Duration	Five (5) months
Expected end results	1. Adoption of Climate Smart Agronomic practices 2. Application of simple Integrated Pest management Strategies (eg. Use of Bio-pesticides) 3. Production of safe vegetables
Any other information	• Success Stories will be replicated in other vegetable producing areas in the urban communities. • MANAGE/NIPHM to support financially in Back at Work Plan where practicable.

Mr. Copperfield Kwami Banini
Deputy Director
Ministry of Food and Agriculture, Plant Protection &
Regulatory Services Directorate Pokuase-Accra, Ghana
Tel: 0243108140
Email: copperbanini@yahoo.com

Name of the Activity	**Responsible use of pesticides in vegetable production**
Problem in your service area	There have reported cases and notifications of harmful organisms (thrips, False codling Moth) in the Agro produce exported to the EU in recent times. As a result of this incident, farmers are indiscriminatingly using chemical pesticides to be able to produce clean produce to this lucrative market. In view of this, most water bodies are being polluted as aquatic life is being lost on daily basis, there are pesticide residues left in these produce as confirmed by the Food and Drugs Authority (FDA), much more pesticide contaminated cases are reported in the clinics and hospitals in these farming communities.
Indian Experience/ Solution/ Innovation	**Indian experience** has demonstrated that chemical pesticides are not the panacea to the pest problems farmers have in their farm production. Integrated Pest Management are being employed by the farmers which enabled farmers to reduce the excessive and indiscriminate use of chemical pesticides. Biopesticides alongside Good Agronomic Practices (GAPs) are used to manage the pests in the farms. Local and less cost effective methods of pest management are being employed as alternatives.
Place	Greater Accra Region , Ghana
Target Groups	Peri- urban Vegetable Farmer Groups, individual vegetable farmers and Extension worker. • Exporters od Agro-based produce

Duration	The programme will run for six (6) month and monthly reporting to MANAGE/NIPHM and Regional PPRSD Officer.
Expected end results	200 Farmers and 32 Extension Officers are expected to be trained and monitored during the period. It is also expected that this training would enable them adopt the use of biopesticides, IPM and GAPs as their main pest management strategies reduce pesticide residue levels to enable us protect the environment. • 15 Quarantine Officers trained on fumigation • 85% of Exporters sensitized and trained on fumigation of commodities.
Any other information	Establishment of Vermicompost for personal use in the garden

Ms. Juliet Mutindi Mulei
Laboratory Technologist
Kenya Plant Health Inspectorate Service/ Analytical Chemistry Laboratory Kenya
Tel: +254 720 315893, +254729787542
Email: jmulei@kephis.org , omwaniki@kephis.org

Name of the Activity	**METHOD FOR REMOVAL OF PESTICIDE RESIDUES IN FRUITS AND VEGETABLES**
Problem in your service area	Detection of high dosages of pesticides residues in fruits and vegetables
Indian Experience/ Solution/ Innovation	• Use of organic farming through the use of vermin-compost. • Regular monitoring of pesticides at National level • Farmers observe and practice Good Agricultural Practices. • Adoption of integrated pest management strategies
Place	Nyandarua Region, Kirinyanga Region
Target Groups	Farmers; Agricultural Extension Officers.
Duration	6 months
Expected end results	• Farmers observing Good Agricultural Practices • Farmers introduced to vermicomposting • Expected reduction in pesticide residue in fruits and vegetables
Any other information	Support from MANAGE and NIPHM to train other officers.

Mr. Maurice Ouma Onyango
Principal Fisheries Officer Ministry of Agriculture, Livestock and Fisheries, State Department of Fisheries and the Blue Economy, Kenya
Tel: +254 727 776 900
Email: mauriceouma8845@gmail.com

Name of the Activity	**Field and household practices for reduction of pesticide Residues in foods**
Problem in your service area	Lack of knowledge on simple methods of reducing pesticide residues on foods (fruits and vegetables).
Indian Experience/ Solution/ Innovation	• Farmers in India are adopting Integrated Pest Management (IPM) strategies to control pests. • Adopting the use of organic manure and biofertilizers in crop production. • Adopting simple methods of reducing pesticide residues.
Place	1. Siaya County (Home area) 2. Nairobi (Workplace)
Target Groups	1. Workmates 2. Fish farmers 3. Small scale farmers
Duration	6 months
Expected end results	• Adoption of simple methods of reducing pesticide residues from fruits and vegetables. • Consumption of relatively pest free fruits and vegetables.
Any other information	-

Mr. Peter Kibue Ng'ang'a
Chief Veterinary Officer/ Senior Lecturer
Ministry of Agriculture, Livestock and Fisheries, State Department of Livestock / Training Division, Kenya
Tel: +254715367882, +254722807985
Email: ahitikabete@gmail.com

Name of the Activity	**VERTEBRATE PEST CONTROL**
Problem in your service area	• Vertebrate pest menace in poultry houses
Indian Experience/ Solution/ Innovation	• Learnt how to identify the rodent from the field. • Manage and control them at field level • India how much to teach other countries in pest control for more trainings of longer periods
Place	KIAMBU COUNTY, KENYA
Target Groups	• Farmers and students in my institutes
Duration	• Six months (April-September, 2018)
Expected end results	• Farmers will be aware of vertebrate pests and their control • Decreased rodent population • Saving on production costs • Decreased zoonotic disease – Leptospirosis • Decreased use of pesticides
Any other information	• Sincerely thanking to NIPHM for the training. It will go a long way in helping many farmers.

Ms. Bernice Oretha Kartoe
Technician Republic of Liberia Ministry of Agriculture
P.O.Box 10-9010 1000 Monrovia 10, Liberia
Tel: +231 886882549, +231770117525
Email: bkartoe2013@gmail.com

Name of the Activity	**Low productivity in yield of fresh fruits and vegetables**
Problem in your service area	Low productivity in yield of farmer in fresh fruits and vegetable in Liberia due to improper monitoring, detection, delimiting survey system in place to access to improve the plant biosecurity and safety in agriculture
Indian Experience/ Solution/ Innovation	• Realizing the importance of 1000 cost traps and lures for the benefits of the farmers. • It has improved in bio-fertilizers for seed treatment. • Identifying the major crops cost in fruits and vegetables in our countries.
Place	Bassa Town Klay Bomi Country
Target Groups	Farmers
Duration	6 months (April – September)
Expected end results	• Expecting the farmers will aware about the trapping technique. • Expecting the reduction of fruit fly after the implementation in their fields. • Adoption of the new fruit fly surveillance
Any other information	I am very grateful to God for been selected as one of the executive, my deepest thanks to all implementing partners and individual who tireless work hard together to this training been successful. This training has added new knowledge skills to me that I can apply in country and my very deepest thanks to NIPHM and the MANAGE.

Mr.Julius Koko Kossigba
Technician KAVTC Klay Bomi COUNTY, Liberia
Tel: 231778220750
Email: wdickson1980@gmail.com

Name of the Activity	**Vertebrate Pest Control**
Problem in your service area	• Less production and productivity of crops due to insect pest and diseases
Indian Experience/ Solution/ Innovation	• Learnt how to identify the pest from the field. • Learn how to manage or control the pest incidence in the field.
Place	• BASSA TOWN KLAY BOMI COUNTY
Target Groups	• Farmers and other institution
Duration	• Six months (April-September, 2018)
Expected end results	• Expecting the farmer will be aware the integrated pest management technique • Expecting the reduction of pest after the implementation of IPM in the field.
Any other information	• Let me thank,NIPHM to train me in biosecurity and food safety aspects • I will surely implement what this institute taught me • And I am also expecting some technical advice in future for better development of our country MAMA LIBERIA

Mr. Elia Kazinga
Agriculture Extension Development coordinator(AEDC)
Ministry of Agriculture /Extension SA DAO, BOX 491 ,SALIMA, Malawi
Tel: +251(0)888573173, 991033488, 994482283
Email: kazingaelia@gmail.com

Name of the Activity	**PEST SURVEILLANCE**
Problem in your service area	Heavy infestation of crops with several types of pests, causing great loses
Indian Experience/ Solution/ Innovation	Use of several techniques for pest surveillance: trapping, sampling and visual sampling. They either regulate or eradicate or contain. They produced a lot of trapping techniques.
Place	Makande EPA, Salima,Malawi
Target Groups	Farmers
Duration	2 years
Expected end results	• To come up with a list of pests and hosts • Control measures
Any other information	• To come up with several controlling measures by using indigenous knowledge and methods • Organizing farmer trainings • Harmonizing the program with other Non-State Organizations

Ms. Chikoma Miriam Madalisto
Agriculture Extension Development Officer,
Agriculture Extension Services, Department of Agricultural Extension Services, P.O.Box.30145, Lilongwe-3, Malawi
Tel: +265 999398880, 885836401, +265 999226261 / 884221605(Supervisor)
Email: chikomirie@yahoo.co.uk, ezidana@gmail.com

Name of the Activity	**PEST SURVEILLANCE**
Problem in your service area	Since 2016/2017 FAW infestation has been a major challenge as this leads to reduction in crop yields in some farmers' fields and in some instances no yield at all. Also presence of fruit flies in the fruit orchards affects farmer's livelihoods and again, the entire nation's economy drastically is also affected.
Indian Experience/ Solution/ Innovation	Based on the experience gained from India, it has indicated that surveillance is the only means of getting to know the presence or absence of pests in a locality and it has shown that farmers in India are continuously practicing the concept through use of different techniques, hence they are able to detect the presence or absence of pests, this enables them to make logical decisions and in the long run try to mitigate the effects of it, hence avoiding the economic and environmental losses they encounter. Farmers have ventured into use of low cost bottle traps which they have found to be very effective among several techniques.
Place	Department of agriculture extension services, Malawi
Target Groups	Farmers and staff
Duration	April 2018- September 2018
Expected end results	Farmers: • Be able to know different surveillance techniques, • Be able to conduct pest surveillance, detect pest presence and identify pests.

	• Be able to prepare low cost bottle trap and lure. • Be able to know how to use and how to place them in the field.
Any other information	• To come up with local controlling measures • Produce agriculture radio programs

Ms. Waing Nandar Kyaw
Junior Research Assistant
Plant Pathology Research Section, Department of Agricultural Research (DAR) D-40, Cherry Myaing Street, Department of Research, Yezin, Nay Pyi Taw, Myanmar
Tel: +95-67-416531,+959797679259
Email: dgdar.moai@gmail.com , waingnandarkyaw@gmail.com

Name of the Activity	**Effect of Biocontrol agent, *Trichoderma harzianum* on rice root nematode (*Hirschmanniella oryzae*)**
Problem in your service area	• Most occurrence soil borne nematode diseases currently. • Rice root nematode, *H. oryzae*,is the second most important diseases among rice nematode diseases. • At present this nematode diseases become severely infested around Nay Pyi Taw especially farmers' fields of Zabathiri Township.
Indian Experience/ Solution/ Innovation	• Based on any experiences determination on the efficacy of ***Trichoderma harzianum*** against root nematode in rice • Conduct on the infested area of farmers' fields and field experiment at DAR.
Place	• Plant pathology research section, department of agricultural research, Nay Pyi Taw,mynmar
Target Groups	• Farmers and extension workers /staff
Duration	• Two years (june 2018 to September 2020)
Expected end results	• Effective control measure using biocontrol agent, ***Trichoderma harzianum*** can be observed and applied against rice root nematode.
Any other information	• The crop variety, susceptible variety (Manawthukha) that is the most widely grown among the farmers will be used in this experiment.

Ms. Win Win Khaing
Junior Research Assistant Plant Pathology Research Section, Department of Agricultural Research (DAR) D-21, Staff Housing, University of Veterinary, Yezin, Nay Pyi Taw, Myanmar Tel: +95-67-416531, +95943132713, +959420740818 Emai:dgdar.moai@gmail.com, winwinkhaingyau@gmail.com

Name of the Activity	**Effect of bio control agents *Trichoderma harzianum* against on rice sheath blight disease**
Problem in your service area	• Currently, this disease occurs very severe in my country humid areas. • It is one of the most serious diseases in rice.
Indian Experience/ Solution/ Innovation	• Based on the Indian experiences, effective bio control agents of *Trichoderma harzianum* against on sheath blight disease.
Place	• Plant pathology research section, department of agricultural research,
Target Groups	• Farmers and extension workers /staff
Duration	• One year (june 2018 to September 2018)
Expected end results	• The effect of bio control agents ***Trichoderma harzianum*** against on sheath blight disease can be observed.
Any other information	• The crop variety, susceptible variety (shwethweyien) that is the most widely grown among the farmers will be used in this experiment.

Ms. Eman Ali Sawi
Quality Control Officer
Ministry of Agriculture and Forestry Quality Control and Export Development Administration Algamaa Street, Sudan
Tel: +249183774688, +249123821656
Email: moafscqu@yahoo.com , emansawi12@gmail.com

Name of the Activity	**Organic Farming for Sustainable Agriculture**
Problem in your service area	• Using pesticides effects on food safety for agriculture products • Impact on the environment and soil degradation • Applying chemical fertilizers affect plant health and quality of production .
Indian Experience/ Solution/ Innovation	✓ Biocontrol of pests : - Natural enemies (predators) - Using selective traps - Using neem extract ✓ Bio fertilizers: Composting, Rhizobium, Azotobacter
Place	Sudan, Ministry of Agriculture and Forestry
Target Groups	Farmers, producers, exporters and extension worker
Duration	2 years
Expected end results	-Reduce the effects of using chemical fertilizers and pesticides on plant and environment -Increase the value and quality of agriculture products of produce organic crops - increase production and productivity
Any other information	-Applying organic farming -We strengthen the opportunities of agricultural products -we increase national income

Mr. Khalil Mohamedelmahdi Suliman
Quality Control Officer
Ministry of Agriculture and Forestry Quality Control and Export Development Administration Algamaa Street, Sudan
Tel: +249183774688, +249912433812, +249123433812
Email: khalilo707@gmail.com , moafsqcu@yahoo.com

Name of the Activity	**Compliance to WTO Measures according to SPS**
Problem in your service area	1. Food Safety Issues (Post-Harvest Problems): a) Pesticides Residues in Agriculture Products. b) Food Contaminants. c) Aflatoxins.
Indian Experience/ Solution/ Innovation	• Surveillance • Using organic pesticides (Neem) • Using organic fertilizers (Composting, biofertilizers and Rhizobium etc.) • Regulation using pesticides • Inspection and quarantine
Place	Ministry of Agriculture (SUDAN)
Target Groups	1. Extension officers 2. Farmers 3. Exporters
Duration	6 to 24 months
Expected end results	1. Decision makers' commitment. 2. Increase awareness about international market requirements. 3. Applying (GAP) in Agriculture. 4. Strengthen food safety standards. 5. Improve the economic status.
Any other information	• Bilateral cooperation between Sudan and India will improve plant biosecurity and food safety situation.

Mr. Francis Okumu Sande
Assistant Agricultural Officer P.O.Box 124, Busitema Sub County, Busia District, Uganda
Tel: +256 787760336, +256 784956580
Email: sandeokumu@gmail.com

Name of the Activity	**FRUIT FLY LURE PREPARATION AND TRAPPING**
Problem in your service area	Fruit production is one the major enterprise that is being promoted by the Government of Uganda with the aim of reducing malnutrition, increasing income of the farmers, promoting the fruit industry and uplifting the country to a middle income status by the year 2020. This may not be achieved due to the challenge of fruit fly infestation in almost all fruit fields, leading to losses/low production/yields in the fruit sector hence affecting the growth of local industry.
Indian Experience/ Solution/ Innovation	Fruit flies may cause up to 90-100% yield loss in fruits, both in the field and post-harvest time if they are not controlled. Control of Fruit flies using synthetic pesticides is very costly and not safe to the consumers. Fruit flies are a major problem for export of fresh fruits. **Solution-**Some farmers in India have demonstrated on a simple and low cost practice of trapping male fruit flies to reduce fertilization in female fruit flies which cause most damage to the fruits. **Innovation-**The simple and low cost Fruit fly pheromone traps were locally developed using water bottles to trap the male fruit flies. Then sex Pheromones such as Methyl Eugenol lure and CUE lure can be prepared to effectively manage fruit flies in fruit farms.
Place	Uganda, Eastern Region, Busia District Local Government Busitema Sub County.

Target Groups	Fruit Farmer Groups and individual farmers who have already established fruit gardens and those who have interest in fruit growing and Extension workers.
Duration	Six (6) Months
Expected end results	Many farmers will be able to adopt the low cost simple technology of preparation of fruit fly lure and locally available traps to reduce male fruit fly population and increase fruit production and fruit quality for better markets.
Any other information	Fruit farmers will be able to increase fruit production to feed the growing population so as to decrease malnutrition, increase household income, provide raw material to upcoming factories and uplift Uganda to a middle income status. However, other activities related to plant biosecurity and food safety are to be implemented since the knowledge is to be used to transform our farmers for a better green future.

Ms. Gertrude Badaru
District Agricultural Officer Arua District Local Government
P.O.Box 1, Arua, Uganda
Tel: 0256 772636778, +256 77653387
Email: victortoa2005@yahoo.co.uk , gertrude_bad@yahoo.com

Name of the Activity	**FRUIT FLY LURE PREPARATION AND TRAPPING**
Problem in your service area	Fruit production under the program of Operation Wealth Creation (OWC) has been first priority crop of the Government of Uganda which has a target of increasing income of the farmers and uplifting households to a middle income class of earning 20million in the year 2020. This has not been achieved due to a big challenges of fruit fly infestation of fruits, leading to total loss of up to 100% total loss in fruit yields, affecting the growth of local industry
Indian Experience/ Solution/ Innovation	**Indian experience** shows that fruit fly is responsible to cause up to 90-100% loss in fruits and vegetables, both in the field and post-harvest time. Fruit flies are also major problem for export of fresh fruits and vegetables. Control of Fruit flies using pesticide for spraying is very costly and not safe to the consumers **Solution,** farmers in India have demonstrated on a simple and low cost practice of trapping male fruit flies to reduce fertilization in female fruit fly which are the most causing damage to the fruits and vegetables. **Innovation** is that simple and cost effective Fruit fly pheromone traps were locally developed by using water bottles to trap the male fruit flies. Then sex Pheromones such as methyl Eugenol lure (ME lure) and CUE lure can be prepared to effectively manage fruit fly in fruit and

	vegetable fields
Place	Uganda, West Nile Region, Arua District local Government.
Target Groups	Fruit Farmer Group who have already established fruit gardens and those who have interest in growing fruits and vegetable. (Farming Groups) and Extension worker.
Duration	Six (6) month report sub mission to both MANAGE and Local Government, then after continuously guiding farmers and those who have interest for growing fruit on commercial purpose.
Expected end results	Many farmers will be able to adopt the low cost simple technique of preparation of fruit fly lure and locally available traps to reduce male fruit fly population and increase fruit production and fruit quality for better markets.
Any other information	Fruit farmers are able to increase fruit production to feed the upcoming factories in the region. Establishment of simple Plant Clinic and Plant Laboratory in the District for training farmer in the preparation of fruit fly lure and local traps.

Mr. Benedict Ssekyanzi
Principal Agricultural Officer
Kiboga District Local Government,
Production Department, P.O Box No 1, Kiboga , Uganda
Tel:+256772697883, +256782245570
Email: ssekyanzibenedict@gmail.com

Name of the Activity	**Capacity building of Sub County Extension Workers in pest and disease surveillance**
Problem in your service area	Inadequate crop pests and diseases surveillance
Indian Experience/ Solution/ Innovation	Giving priority to pest and disease surveillance
Place	Kibogo District, Uganda
Target Groups	Sub County Agrl. Extension Workers
Duration	6 months (March-August 2018)
Expected end results	• Reduction in use of pesticides as a result of timely detection of pests and diseases • Less environmental contamination • Food safety will be ensured • Reduction in pest and disease outbreaks • Reduction in human exposure to pesticides • Decrease in costs of production as a result of reduction in use of pesticides • Increased profitability of agriculture
Any other information	Nothing for now

ANNEXURE –V

FEEDBACK REPORT

Evaluation of Presentations

Presentation Topic	Rating
WTO-SPS Agreement vis-à-vis Plant and Food Safety	9.30
Concept of Plant Bio-Security and Issues	9.82
Inspection & Sampling Procedures for export and import of Agricultural Commodities	9.14
Fruit fly Identification and Lure Preparation	9.66
Pest Surveillance and Surveillance Methodologies	9.56
Vermicomposting	9.56
Overview of Phytosanitary Measures	9.22
Quarantine Pest Detection & Identification (Insects & Pathogens)	9.40
Regulations for Quality Control of Pesticides	9.22
Pesticide Residues in Food Commodities vis-à-vis Food Safety Regulations	9.48
Concept of Agro Ecosystem Analysis (AESA) & Ecological Engineering based Plant Health Management	9.56

Suggestions & Remarks:

- Presentations were done by very competent and experienced staff. They all had hands on experience of what they were doing.
- Vermicomposting was a very interesting topic which is very cheap and easy to implement.
- Pest Surveillance and Surveillance Methodologies is a good
- Most of the presentations were participatory. Eg. WTO-SPS Agreement, Concept of Biosecurity and AESA. This gave room for active participation and lively lectures. The lecture periods were too packed
- Pest Surveillance and Surveillance Methodologies is good and instating topic for me
- I liked all the presentations mostly about fruit identification and lure preparation. I liked it most because this has helped me a lot in knowing how to prepare lure and the low cost bottle trap, and how to trap the pest and identify. The presentations were conducted in a manner that everybody could understand better. On the other hand Inspection and sampling procedures for export and import of agricultural commodities because it was not properly understood, because time was very limited since it has been my first time to hear about it.
- Reasons I liked most about the presentations are that when we go back to our county, lure preparation method, knowledge, experiences about pest surveillance and also vermicomposting can be applied.
- All presenters were well versed to the topics. My best was responsible use of pesticides and vertebrate pests
- Liked all presentations,
- 1. WTO-SPS Agreement vis-à-vis Plant and Food Safety

- Vermicomposting
- Concept of Agro Ecosystem Analysis (AESA) & Ecological Engineering based Plant Health Management.
- These presentations have given me in-depth knowledge and very good orientation about the subject matters.
- The most i like best presentation is responsible use of pesticides residues.
- All of presentations are good.
- I didn't found least presentations.
- All of presentations are valuable for me because all of learning lectures useful for my country agriculture.
- I like the presentation of fruit fly identification and lure preparation because it make me to understand the problem of fruit fly in my country
- Fruit fly identification and lure preparation, the nature of the traps that does not render the products to pesticide residues and good for organic farming.
- Concept of AESA and EE Based PHM That interact5ion among organisms is very important in the ecosystem and predators shoud be allowed to exist in the ecosystem.
- 1. WTO-SPS Agreement vis-à-vis plant and food safety.
- All presentations were very good and interesting.
- it is good to give separate sessions to make discussion between all participants .
- All, excellent.
- Concept of Plant Bio-Security and Issues: Liked everything about the presentation and especially how it related to our present world issues Vermicomposting: good
- I liked the practical sessions which was very important to understand and the theory was also very participatory which was very interesting and easy to understand. Good work done.

Evaluation of Exercise

Exercise Topic	Rating
Biological Control Laboratory (Parasitoids, Predators & Microbials) - Laboratory Visit	9.30
Plant Health Diagnosis Lab - Plant Biosecurity Laboratory Visit	9.30
Nematology Lab - Laboratory Visit	9.40
Fruit fly Identification and Lure Preparation - Practical Exercise	9.74
Pest Surveillance and Surveillance Methodologies - Field Visit	9.56
Vermicomposting - Practical	9.74
Visit to Rural Technology park of National Institute of Rural Development and Panchayat Raj	9.22
Visit to MANAGE	9.48
Visit to International Crop Research Institute for the Semi-Arid Tropics (ICRISAT)	9.74
Visit to Pomegranate Export Unit – Cold Treatment (Phytosanitary treatment)	9.66
Fumigation Demonstration	9.48
Quarantine Pest Detection & Identification (Insects & Pathogens) – Practical Exercise	9.22

Sprayers Workshop Visit	9.48
Biofertilizer Lab Visit	9.22
Visit to Pesticide Quality Control Lab and Practical Exercise on Safe use of Pesticides	9.66
Visit to Pesticide Residue Analysis Laboratory	9.66
Practices (Field and Household) for reduction of Pesticide Residues in Foods – Practical	9.74
Agro Ecosystem Analysis (AESA) & Ecological Engineering based Plant Health Management –	9.74

Suggestions & Remarks:

- All the exercises were very relevant, however more time should be given to practicals for the participants to have a hands experience especially for topics of their preference as it may have a bearing on their job back home
- Agro Ecosystem Analysis (AESA) & Ecological Engineering based Plant Health Management – Field Exercise & Classroom Presentations is a good topic good methods.
- Reduction of pesticide residues in food is a new technique have learned and will implement it in country
- Agro Ecosystem Analysis (AESA) & Ecological Engineering based Plant Health Management – Field Exercise & Classroom Presentations
- The practicals gave room for all Executives to participate. Gave room for a deeper understanding. More time should be allotted for practical sessions
- All presentations were done in a manner that that were properly understood by trainees but there is need to improve on time because it was limiting
- It is better if practical exercise for reduction of pesticide residues in foods can be done and AESA exercise and lecture is very interested for me.
- Good. I liked vermicomposting most. It was easy to understand and very practical. Least liked Plant Health Diagnosis Lab - Plant Biosecurity Laboratory Visit. It was too technical. Need more time to see the results.
- Theory exercises were very relevant to the course and they have given us a lot of exposure and insight to the topics.
- Attachment of more staff for guidance at these practical sessions will be very good.
- 1. The most i liked best exercise is visit to pesticide residue analysis theory.2.I have no liked least exercises because all of exercise are valuable for me.3.
- I like the bio fertilizer lab visit make to understand how to use bio fertilizer
- AESA was very interesting whereby drawing of the predators and pests on the plants were identified
- 1. All topics were excellence.
- Pest Surveillance and Surveillance Methodologies.
- All exercises were very good and full of knowledge, it were adequate.
  I think nothing to add
- □□□ll excellent.
- □More time and attention should be dedicated to the field work.

- Liked most: lecturing was handled by competent staff. They were explaining the material in a way that a layman can easily connect what is going on.
- They deserve distinction.
- Good work done.

Suggestions & Remarks – FIELD TRIPS

- Field trips were good, however, one visit was done in the late afternoon when participants were exhausted, i suggest that in future both the visits be held in early hours in different days for meaningful participation of executives
- Visit to MANAGE.I appreciate the work it has done.
- Practical sessionwere meaningful. Executives could get firsthand information on how certain activities are carried out in terms of trade and related activities following laid down international rules.
- The trip was organized in a way that it pleased me because I have learned a lot from the field visits. Mostly the trip to ICRISAT there were a lot that we could have learnt on the issue of fumigation processes and there is need to improve on the allocation of time. I also like the trip to the FILM city where we had time to be entertained in one way or the other.
- Visiting to field and doing exercises get many experiences and valuable knowledge.
- Pest Surveillance and Surveillance Methodologies - Field Visit--good and educative
- Pest Surveillance and Surveillance Methodologies. It was excellent exposure to understand surveillance methodologies
- The field trips were very exciting and fulfilling, projecting Indian cultural heritage. it was a very good experience. What l dislike about these visits was that we have not been given enough time in some of the places.
- 1. I like most field trip is ACRISAT because this place has many plants are growing by methods of scientists. I get a lot of knowledge from this place.2.I have no liked least because all of trip are get knowledge and happiness to me.
- The trips were good for learning and improving on our skills
- First -Visit to Pesticide Quality Control Lab and Practical Exercise on Safe use of Pesticides.
- Second-Visit to International Crop Research Institute for the Semi-Arid Tropics (ICRISAT).
- I think that , it is better to give more time to the outside visits.
- All excellent.
- Liked most: At the site of visitation, hospitality was excellent and the persons who were designated to handle the visitation session did the job competently.
- All the field trips were good, i like the all.

Evaluation of Presenters

Presenter Name	Topic	Rating
Dr. Cherukuri Srinivasa Rao	WTO-SPS Agreement vis-vis Plant and Food Safety	9.66
Dr. J. Alice R.P. Sujeetha	Concept of Plant Bio-Security and Issues	9.74
Shri. A. Mariadoss	Fruit fly Identification and Lure Preparation	9.74
Dr. C.S.Gupta	Pest Surveillance and Surveillance Methodologies	9.66
Dr. Sakthivel	Vermicomposting	9.66
Dr. Girish, A. G./Dr. C.S.Gupta	Overview of Phytosanitary Measures	9.48
Ms. Madhubala /Shri. A. Mariadoss	Quarantine Pest Detection & Identification (Insects & Pathogens)	9.48
Dr. Cherukuri Srinivasa Rao	Regulations for Quality Control of Pesticides	9.56
Dr. Cherukuri Srinivasa Rao	Pesticide Residues in Food Commodities vis-a-vis Food Safety Regulations	9.66
Dr. Narsi Reddy/Dr. Edpuganti Sree Latha	Concept of Agro Ecosystem Analysis (AESA) & Ecological Engineering based Plant Health Management	9.66
Dr. Sanjay Arya	Inspection & Sampling Procedures for export and import of Agricultural Commodities	9.66

ANNEXURE VI

PRE & POST EXAM REPORT

Pre Exam Average : 11.30
Post Exam Average : 17.65

PRE-EXAM MARKS

Sl. No	Name	Pre Exam Marks
1	Mr. SSEKYANZI BENEDICT	19
2	Mr. KEPALETSWE KABO	18
3	Mr. BANINI COPPERFIELD KWAMI	17
4	Ms. MULEI JULIET MUTINDI	15
5	Mr. OKUTU ADI	15
6	Mr. ONYANGO MAURICE OUMA	15
7	Dr. NG'ANG'A PETER KIBUE	15
8	Mr. SANDE FRANCIS OKUMU	14
9	Mr. PRAH GEORGE	13
10	Mr. SULIMAN KHALIL MOHAMEDELMAHDI KHALIL	12
11	Ms. BADARU GERTRUDE	12
12	Dr. NASRAT SAMIULLAH	11
13	Ms. CHIKOMA MIRIAM MADALITSO	10
14	Mr. TABIB BASIR AHMAD	10
15	Mr. KAZINGA ELIA	9
16	Ms. KYAW WINE NANDAR	9
17	Dr. KHAING WIN WIN	8
18	Ms. KARTOE BERNICE ORETHA	8
19	Mr. MICHEL TSHIANZ A KANGASA	8
20	Dr. SAWI EMAN ALI	8
21	Mr. KOSSIGBA JULIUS KOKO	7
22	Ms. MWILAMBWE MARGUERITE MARIE MWINZIYA	5
23	Dr. ZAHID BISMLLAH	2

POST-EXAM MARKS

Sl. No	Name	Post Exam Marks
1	Mr. SULIMAN KHALIL MOHAMEDELMAHDI KHALIL	21
2	Mr. KEPALETSWE KABO	21
3	Dr. ZAHID BISMLLAH	21
4	Ms. KARTOE BERNICE ORETHA	20
5	Mr. BANINI COPPERFIELD KWAMI	20
6	Ms. BADARU GERTRUDE	20
7	Mr. ONYANGO MAURICE OUMA	20
8	Mr. OKUTU ADI	19

9	Ms. MULEI JULIET MUTINDI	19
10	Dr. NASRAT SAMIULLAH	19
11	Ms. KYAW WINE NANDAR	19
12	Mr. SSEKYANZI BENEDICT	19
13	Mr. SANDE FRANCIS OKUMU	18
14	Dr. NG'ANG'A PETER KIBUE	18
15	Dr. SAWI EMAN ALI	18
16	Mr. PRAH GEORGE	17
17	Mr. TABIB BASIR AHMAD	17
18	Mr. KAZINGA ELIA	16
19	Ms. CHIKOMA MIRIAM MADALITSO	15
20	Mr. MICHEL TSHIANZ A KANGASA	15
21	Dr. KHAING WIN WIN	13
22	Ms. MWILAMBWE MARGUERITE MARIE MWINZIYA	13
23	Mr. KOSSIGBA JULIUS KOKO	8

रा व स्वा प्र सं
NIPHM