

**EAST AFRICA AGRICULTURAL PRODUCTIVITY PROJECT  
ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK**

**FINAL DRAFT**

**Tanzania**

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## I. Introduction

1. This document presents an environmental and social management framework (ESMF) for the activities taking place in Tanzania under the East Africa Agricultural Productivity Program (EAAPP). The ESMF also incorporates a pest management plan (PMP). The ESMF builds on Tanzania's existing framework for environment management and regulation and establishes a set of specific processes, policies, capacity building and monitoring activities that would be required to mitigate the potential environmental risks or impacts arising from implementation of EAAPP. The ESMF also builds on the guidelines for management of environmental impacts developed by the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA). Although this document is specific to Tanzania, the general framework is common across the four countries receiving EAAPP financing.

## II. Background

2. The overall goal of EAAPP is to enhance existing technology generation, training and dissemination programs that would be scaled up and developed into regional centers of excellence (RCoEs) that would take a lead role in technology generation and dissemination and training on a regional basis.

3. A Center of Excellence is defined as a leading research programme/center that has established research and training initiatives that distinguish it as a leader in the region and beyond. The programme/center should be uniquely positioned in forging partnerships and developing communities of innovation across the subregion. A programme designated as a Center of Excellence should be in a position to spearhead regional initiatives because it has a highly qualified staff, it is connected to the global system of research, it has high quality facilities and project management, and has the ability to create partnerships with businesses, NGOs, other government entities and universities.

4. To reach technology to the farm level, EAAPP would support activities and investments to increase the availability at the farm level of seeds and breeds with improved technology for the commodities corresponding to each of the RCoEs. The project would support research agencies to produce breeder seed, and would advise and assist seed companies and farmers to multiply and markets seeds of improved cultivars.

5. The first five year phase of EAAPP would concentrate on the establishment of four regional centers of excellence (RCoEs) with participation open to all ASARECA countries. The second five year phase of the program would further strengthen RCoE establishment and could expand to a larger number of RCoEs spread across more countries in the region. Further expansion of the program to include new RCoEs, however, could occur in either phase one or two through additional financing mechanisms.

6. In consultation with ASARECA members, Ethiopia, Kenya, Tanzania, and Uganda have proposed establishing regional centers of excellence in the following areas and themes:

- **Wheat (Ethiopia).** Regional priority areas include: (i) wheat germplasm enhancement including characterization, hybridization, germplasm acquisition, and disease monitoring and surveillance; (ii) enhancing rainfed wheat production including variety development, weed and pest management, and development of farm implements; (iii) breeder and pre-basic seed production; (iv) socio-economics of wheat research; and (v) technologies for irrigated wheat production.

- **Smallholder Dairy (Kenya).** Regional priority areas include: (i) animal genetic improvement including genetic resource characterization, breeding, upgrading of local genetic resources; (ii) feed resource utilization including fodder/pasture, crop residues, feed conservation, and farming systems; (iii) animal health including policy and regulatory/quality assurance services; (iv) processing and value addition for dairy products; and (v) socio-economics including policy analysis, feasibility studies, input/output market analysis, and gender studies.
- **Rice (Tanzania).** Regional priority areas include: (i) breeding resistance to biotic stresses - diseases and pests – and abiotic stresses – drought and cold tolerance, salinity and toxicity; (ii) germplasm collection and characterization; (iii) integrated production and management for soil, water and pests; (iv) post harvest processing, marketing and value addition; and (v) development of labor saving technologies.
- **Cassava (Uganda).** Regional priority areas include: (i) developing varieties with high value agronomic and processing traits and disease resistance; (ii) addressing nutritional allied deficiencies of communities dependent on cassava as a major staple; (iii) enhancing productivity, value addition and commercialization including improving access to regional and global markets; and (iv) identification and management of information and technologies at national and regional levels.

7. Financing for activities under the proposed RCoE would take place through IDA credit allocations to each country. The IDA credit allocation for each country would include funds for the RCoE to be established in the host country as well as financing for their participation in programs led by RCoEs located in other countries.

8. The following activities would be financed under the program: (i) strengthening of regional centers of excellence; (ii) technology generation and dissemination; (iii) improving the availability of technologies associated with centers of excellence – both seeds and breeds; and (iv) coordination at the national and regional level and policy related research and advocacy.

9. **In Error! Reference source not found.** EAAPP would be implemented through the Agriculture Sector Development Program (ASDP) with a lead role taken by the Ministry of Agriculture, Food and Cooperatives. Activities would take place primarily on the research stations of Department of Research and Development. Additional institutions at would also be involved in specific EAAPP activities. These would include: (i) district extension departments; (ii) the Tanzania Official Seed Certification Agency (TOSCA); (iii) the Agricultural Seed Agency; and (iv) private sector seed producers. Annex 1 contains a flow chart of implementation mechanisms within Tanzania. Further detail on project activities and implementation mechanisms can be found in the proposals prepared by each country and the EAAPP Project Appraisal Document.

### III. Assessment of Potential Negative Impacts and Risks

#### A. Expected Scope of Negative Impacts

10. There are no potential large-scale, significant or irreversible adverse environmental impacts associated with EAAPP, however, there are potential risks or negative impacts that could arise from EAAPP implementation. In particular, these could include:

- Increased vulnerability to pests due to poor pest management or introduction of new cultivars

- Localized agro-chemical pollution and reduction of water quality from agro-chemical use or poor handling of pesticides and disposal of empty chemical containers; and
- Land or water degradation due to the rehabilitation of small scale irrigation systems or the construction or rehabilitation of buildings
- Unintended movement or transmission of plant varieties within or between countries as a result of field trials or other research activities
- Land or water degradation due to maintenance and rehabilitation of existing small scale irrigation systems at research stations, or the construction or rehabilitation of additional buildings at existing research stations.

## **B. Expected Scale of Negative Impacts**

11. Most technology generation and dissemination activities financed by EAAPP would take place primarily within the existing fields and laboratories of Zonal agricultural research stations, seed farms or regulatory agencies<sup>1</sup>. This would not cover a wide geographic area and most field testing would take place on relatively small plots of land<sup>2</sup>. The dissemination of technology, however, could have a potentially significant impact in the long term if technologies developed or recommended are widely adopted by farmers. Although this could potentially lead to a large cumulative impact, the project design includes consultation mechanisms with end users and farmers to ensure that technology dissemination activities and technology recommendations do not contribute to negative impacts.

## **C. Risks to Management or Mitigation of Negative Impacts**

12. Several risk factors could affect exacerbate or inhibit the management of negative environment impacts associated with the project. These include:

- Lack of adequate capacity for environmental screening and management of technology generation, dissemination and activities; and
- The regional nature of program and the involvement of numerous institutions and actors, which may complicate efforts to coordinate mitigation efforts

13. Specific capacity building and monitoring activities will be required in order to minimize such risks and are listed along with a budget below.

## **IV. Regulatory Framework Governing the ESMF**

14. The Environmental Management and Coordination Act, 1999 and the Environmental Management Act, 2004 provides for the establishment of a legal and institutional framework for the management of the environment in Tanzania. Part VI sections 81 to 103 and it's subsequent in the Environmental Impact Assessment and Audit Regulations, 2005 –G.N. No.349 of 2005, regulations 12 to 43 provide guidelines on Environmental Impact Assessment (EIA). The National Environment Management Council (NEMC) is corporate body established in the Office of the Vice President that is responsible for ensuring that all development projects in Tanzania comply with all relevant environmental laws and review and recommend for approval EIAs.

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<sup>1</sup> Most field activities of the Rice Center of Excellence would be based at Dakawa; Mlingano; Mikocheni; Ukiriguru; Uyole; and Naliendele Research Centers with additional activities likely at ASA seed farms in Arusha, Morogoro and Kilangani.

<sup>2</sup> Typical field trials average 10ft by 5ft and filed plots for bulking would average 1 ha or less.

15. Tanzania also published its National Environmental Policy (NEP) in December 1997 and the National Conservation Strategy for Sustainable Development, the National Environmental Action Plan (NEAP) and specific sectoral policies such as those on land, mining, energy, water, agriculture, population and fisheries. The NEP recognizes the EIA process as a means of ensuring that natural resources are soundly managed, and of avoiding exploitation in ways that would cause irreparable damage and social costs.

16. Based on World Bank OP 4.01, EAAPP is rated as Environment Assessment Category B project. Project activities do not require a full EIA. Approval of the ESMF by NEMC and periodic supervision on ESMF implementation by NEMC and other stakeholders is considered sufficient to meet existing regulatory requirements and World Bank safeguard policies.

## V. Proposed Mitigation Measures

17. The objective of the ESMF is to provide a framework for preventing or mitigating the negative impacts associated with EAAPP implementation. The following mitigation measures would be used:

Negative Impact	Mitigation Measure
A. Increased vulnerability to pests due to poor pesticide management or introduction of new cultivars	<ul style="list-style-type: none"> <li>• Use of integrated pest management practices incorporating biological and environmental controls over chemical pesticides where possible</li> <li>• Comprehensive testing of new cultivars for pest resistance prior to release</li> </ul>
B. Localized agro-chemical pollution of soils and water and reduction of water quality from agro-chemical use or poor handling of pesticides and disposal of empty chemical containers;	<ul style="list-style-type: none"> <li>• Application and promotion of pesticide management practices outlined in the International Code of Conduct on the Distribution and Use of Pesticides<sup>3</sup></li> </ul>
C. Unintended movement or transmission of technologies – including transgenic crops - within or between countries as a result of field trials or other research activities.	<ul style="list-style-type: none"> <li>• Use of international standards for conducting recombinant DNA research and mechanisms for internal approval and monitoring and risk management of research</li> <li>• Environmental assessment including risk assessment and management plan for field trails of transgenic crops including post trial monitoring measures all of which should be subject to a third party expert review prior to implementation.</li> </ul>
D. Land or water degradation due to the construction, maintenance and rehabilitation of small scale irrigation systems or the construction or rehabilitation of buildings	<ul style="list-style-type: none"> <li>• Environmental assessment of construction and civil works that is in compliance with national legislation and World Bank Operational procedure on environmental assessment.</li> </ul>

### A. Integrated Pest Management

18. Integrated Pest Management (IPM) is an effective approach to combat the negative effects of pesticide misuse, which can result in the destruction of crop pollinators leading to poor

<sup>3</sup> International Code of Conduct on the Distribution and Use of Pesticides (Revised Version), FAO, 2002, and supporting guidelines. See <http://www.fao.org/ag/AGP/AGPP/Pesticid/a.htm>

crop yields; elimination of the natural enemies of crop pests and consequent loss of natural pest control that keeps the populations of crop pests very low; development of pest resistance to pesticides, encouraging further increases in the use of chemical pesticides; contamination of the soil and water bodies; pesticide poisoning of farmers and deleterious effects on human health; unacceptable levels of pesticide residues in harvested produce and in the food chain; and loss of biodiversity in the environment.

19. Successful IPM is based on building sound farmer knowledge of the agro-ecological processes of the farming environment and empowering them to make informed decisions on the most appropriate management strategies to apply a specific period of crop development and production cycle.

20. EAAPP would promote the use of IPM practices, in particular through the following measures where possible:

<b>IPM Issues</b>	<b>EAAPP Supported Actions</b>
Increased use and reliance on chemical pesticides	<ul style="list-style-type: none"> <li>• Promote adoption of IPM on chemical pesticide practices through farmer education and training;</li> <li>• Move farmers away from input-dependent crop/pest management practices and promote use of locally produced organic matter, botanical pesticides and biological control</li> </ul>
Current pest management practices	<ul style="list-style-type: none"> <li>• Allocate adequate resources to implement National Plant Protection Policy;</li> <li>• Increase IPM awareness amongst policy makers and farming community; and</li> <li>• Abolish free distribution of pesticides to farmers and promote safe handling and application of pesticides</li> </ul>
Enforcement of legislation	<ul style="list-style-type: none"> <li>• Strengthen institutional capacity to effectively supervise compliance with pesticide legislation.</li> </ul>
IPM research and extension	<ul style="list-style-type: none"> <li>• Strengthen IPM research;</li> <li>• Strengthen IPM extension;</li> <li>• Strengthen collaboration for field implementation of IPM.</li> </ul>
Environmental hazards of pesticide misuse	<ul style="list-style-type: none"> <li>• a) Create public awareness of pesticide misuse hazards through public awareness campaigns;</li> <li>• (b) Undertake regular assessment of pesticide residues in irrigated agricultural production systems and in harvested produce; and</li> <li>• (c) Carry out monitoring of pesticide poisoning in the farming and rural communities.</li> </ul>
Increased dependence on chemical control	<ul style="list-style-type: none"> <li>• Support traditional mixed cropping systems to keep pest species from reaching damaging levels.</li> <li>• Promote proper disposal of unused agricultural chemicals and packaging materials.</li> </ul>

## **B. Pesticide Use**

21. The following criteria apply to the selection and use of pesticides in activities under EAAPP:

- they must have negligible adverse human health effects;
- they must be shown to be effective against the target species;

- they must have minimal effect on non-target species and the natural environment. The methods, timing, and frequency of pesticide application must be aimed to minimize damage to natural enemies; and,
- their use must take into account the need to prevent the development of resistance in pests.

22. Pesticide financed by EAAPP must be manufactured, packaged, labeled, handled, stored, disposed of, and applied according to standards that, at a minimum, comply with the FAO's Pesticide storage and stock control manual (FAO, 1996), Revised guidelines on good labeling practice for pesticides (FAO, 1995), Guidelines for the management of small quantities of unwanted and obsolete pesticides (FAO, 1999), Guidelines on Management Options for Empty Pesticide Containers (FAO, 2008), and Guidelines on personal protection when using pesticides in hot climates (FAO, 1990).

23. Consistent with World Bank OP 4.07, EAAPP financing will not be used for formulated products that fall in WHO classes IA and IB, or formulations of products in Class II, if (a) the country lacks restrictions on their distribution and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly.

24. EAAPP financing will not be used for any pesticide products which contain active ingredients that are listed on Annex III of the Rotterdam Convention (on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade), unless the Country has taken explicit legal or administrative measures to consent to import and use of that active ingredient.

25. EAAPP financing will not be used on any pesticide products which contain active ingredients that are listed on Annex A & B of the Stockholm Convention on Persistent Organic Pollutants, unless for an acceptable purpose as defined by the Convention, or if an exemption has been obtained by the Country under this Convention.

### **C. Transgenic Crops**

26. EAAPP would support research on transgenic crops only when the proposals demonstrate consistency with the Tanzania's national biosafety framework.

27. Laboratory research would not take place unless guidelines for conducting recombinant DNA research and mechanisms for internal approval and monitoring and risk management of such research have been implemented. These guidelines need to be of international standard such as 'National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules'<sup>4</sup>; or a functional equivalent.

28. Prior to the approval of research sub-projects involving confined field trails of transgenic crops, investigators would be required to submit an Environmental Management Plan (EMP) which would be part of the research proposal. The EMP is described in more detail below and for transgenic crop related research, would cover risk assessment and management, description of the conduct of the field trial, and post trial monitoring measures. The research proposal and EMP would be subject to a third party expert review. Such third party review will also determine whether there is a risk of transboundary movement of any transgenic crop.

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<sup>4</sup> [http://oba.od.nih.gov/rdna/nih\\_guidelines\\_oba.html](http://oba.od.nih.gov/rdna/nih_guidelines_oba.html)

## **D. Environmental Assessment**

29. Any transgenic crop related research or significant civil works financed under EAAP would trigger an assessment process designed to assess potential environmental impacts and design appropriate mitigation measures through preparation of an EMP. To identify whether EAAPP activities would require an EMP, or other mitigation measures, such as incorporating environmental provisions into construction contracts, implementing institutions would first specify the potential environmental impact using a simple screening form and checklist that would identify the need for an EMP (see Annex 2 for checklist).

30. The EMP will consist of a set of mitigation, monitoring and institutional measures to be taken during implementation to eliminate adverse environmental impacts, offset them, or reduce them to acceptable levels. The EMP is a sub-project specific plan should be brief and specific, and also include the actions needed to implement these measures, including the following features:

31. Mitigation: Based on the environmental impacts identified through the checklist, the EMP should describe the technical details of each mitigation measure, together with designs, equipment descriptions and operating procedures as appropriate.

32. Monitoring. The EMP should include a monitoring section that will be linked to the mitigation measures. Specifically, that monitoring section of the ESMP should provide:

- A specific description and technical details of monitoring method, including the indicators to be measured, how they will be measured and by whom, the sampling locations, the frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions, e.g. the need for on-site construction supervision, or the need to test and have a water quality monitoring plan, etc.
- Monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and to furnish information on the progress and results of mitigation.

33. Responsibilities. The EMP should also provide a specific description of institutional arrangements for the sub project, (i.e. who is responsible for implementing the mitigation measures and carrying out the monitoring regime for operations, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting and staff training.)

34. Budget. Additionally, the EMP should include an estimate of the costs of the measures and proposed financing source for mitigation activities recommended so that implementing institution can budget the necessary funds. Similar to the process for planning of sub projects, the mitigation and monitoring measures recommended in the EMP should be developed in consultation with all the affected groups to include their concerns and views in the design of the EMP.

35. Annex 3 contains a format for the EMP.

## **VI. ESMF Implementation**

### **A. Institutional Structure and Responsibilities**

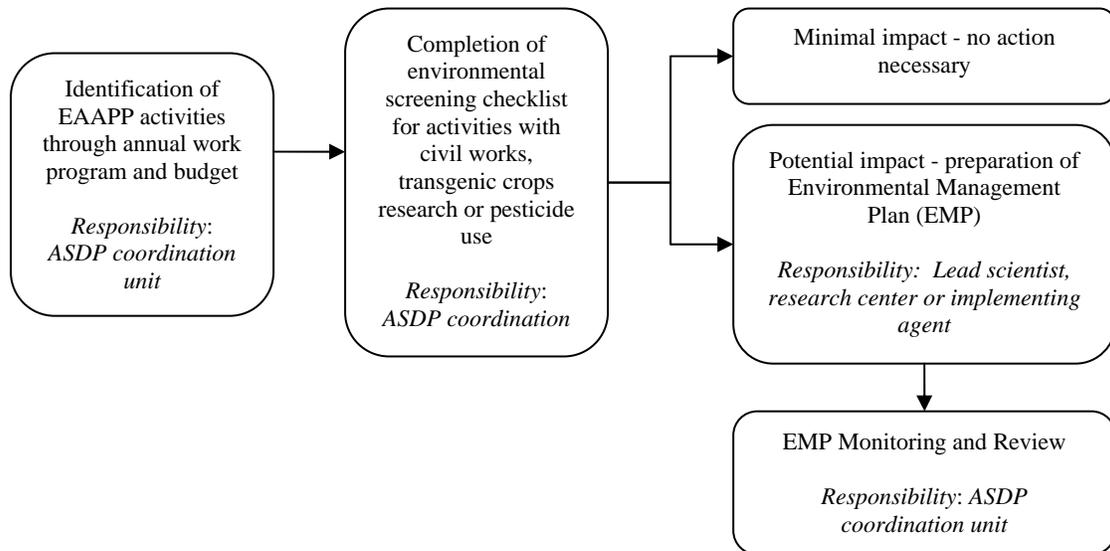
36. Institutional responsibility for implementation of the EMP would rest with the project coordinating unit in the ASDP. In particular, the coordinating unit would:

- Ensure the screening process would be used to assess the potential impacts associated with EAAPP activities and subprojects
- Review research proposals and implementation reports from implanting agencies for compliance with the ESMF
- Request proponents of non-compliant proposals to revise them accordingly
- Review EMPs reports to ensure that environmental mitigation measures recommended are of acceptable standards
- Monitor the implementation of the mitigation measures
- Coordinate the provision of training and capacity building on ESMF compliance for implementing agencies as needed
- Report on ESMF implementation to NEMC

37. Detailed description of EAAPP implementation structure is found in the Project Appraisal Document. The Ministry of Agriculture, Food and Cooperatives (MAFC) will be the lead implementing agency. The ASDP coordination unit will have an EAAPP coordination focal point who will report to the coordinator of the unit, the Director, Policy and Planning, MAFC will have primary responsibility for implementation of the ESMF. Short term technical assistance will be required in initial training on the ESMF and in undertaking monitoring and third party reviews of EMPs. These functions will be contracted in as needed, a budget is provided below in section D.

38. A work program and budget will be prepared on an annual basis for EAAPP and activities that have civil works or involve transgenic crops would require completion of the environmental screening checklist. If activities are judged to have minimal impact no further action would be required. Activities judged to have a potential negative impact would require preparation of an EMP. The EMP would be monitored and reviewed by the coordination unit in the KAAPP Secretariat.

**Figure 1. EAAPP Environmental Screening Process for EMP Preparation**



## **B. Capacity Building Requirements**

39. Capacity building will be required to implement the recommendations outlined in the ESMF. Research staff and other implementing actors may require training in IPM, environmental screening, EMP preparation as well as some other mitigation measures. In addition, it will be necessary to build awareness and knowledge in environmental screening and EMP preparation among the relevant implementing institutions.

40. During the first six months of EAAPP implementation, a capacity building plan would be prepared by the coordination unit in ASDP describing the capacity building to be provided. This could include capacity building on:

41. The Environmental Management process:

- Review of Environmental and Social Management Process
- Review of the ESMF (this document)
- Classification of project activities
- How to prepare EMPs
- How to measure cumulative adverse impacts
- Design of appropriate mitigation measures
- How to monitor mitigation measures
- How to embed the Environmental Management process into the civil works contract

42. As well as selected topics on environmental protection:

- Integrated Pest Management
- Safe management of pesticides
- Management of transgenic crops

## **C. Monitoring**

43. Monitoring of the ESMF implementation is needed to verify impacts, ensure adherence to approved plans, environmental standards and general compliance. Monitoring of the ESMF is not to be confused with monitoring EMPs, which are sub-project specific and therefore site specific only. Monitoring of the ESMF covers the entire EAAPP project at the national level.

44. The objective of ESMF monitoring is to: (i) provide timely information about the success or otherwise of the Environmental Management process outlined in the ESMF in such a manner that changes can be made as required to ensure continuous improvement to the process; and (ii) to evaluate the performance of the ESMF by determining whether the mitigation measures designed into EAAPP activities have been successful in such a way that the pre-program environmental condition has been restored, improved upon or worse than before and to determine what further mitigation measures may be required.

45. The project coordinating unit of ASDP will undertake ESMF monitoring. Should there be an activity in which there are indications of serious breaches of the ESMF, they will undertake a special study to determine the true extent of the breaches and to determine the way forward. Independent assessment of the adequacy and implementation of the ESMF at two or three year

intervals would also be undertaken in coordination with NEMC. Annual reports on ESMF implementation will be compiled and submitted by the coordinating units at EIAR and MoARD.

#### **D. Required Budget**

46. Additional financial resources are required to support implementation of the ESMF through the provision of specialized technical assistance. Most technical assistance would be required in the initial year of the project to launch ESMF implementation and build capacity. Recurring costs in later years would cover the cost of monitoring and follow up training as needed.

#### **Proposed ESMF Implementation Budget**

<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Quantity</b>	<b>Total Cost</b>
<i>Year 1 costs</i>				
Training technical assistance	person days	\$300	120	\$36,000
Travel costs	Lump sum			\$5,000
Training materials	lump sum			\$5,000
Monitoring technical assistance or third party reviews	person days	\$300	45	\$11,250
<i>Sub-total</i>				<i>\$57,250</i>
<i>Year 2-5 annual costs</i>				
Monitoring technical assistance or third party reviews	person days	\$300	45	\$11,250
Travel costs	Lump sum			\$5,000
<b>Total ESMF implementation cost years 1 to 5</b>				<b>\$122,250</b>

## **Annex 1: Implementation of Integrated Pest Management**

### **Introduction**

Integrated pest management is a decision-making process for the selection, implementation, and evaluation of pest management practices. It utilizes all available methods to achieve the most economically and environmentally sound management program. IPM is the integration of available techniques to reduce pest populations and maintain them below the levels causing economic injury in a way that avoids harmful side effects.

Specific pest management needs vary with the crop, cropping system, pest problems, pesticide use history, socio-economic conditions, and other factors. There are, however, well-defined principles that guide the implementation of integrated pest management (IPM). Based on these principles, some guidelines can be offered for the development of and execution of IPM activities for community subprojects. The implementers of the subprojects should adopt these guidelines to the conditions found in their subprojects.

IPM can decrease pest losses, lower pesticide use, and reduce overall operation costs, while increasing crop yield and stability. Successful IPM programs have been developed for pests on various crops.

### **Steps to Implement IPM**

#### ***Step 1. Assess IPM needs and establish priorities***

- Consider the relative importance of agriculture in the overall project;
- Consider the relative importance of target crops as a source of community livelihood;
- Review pesticide use history, trends and availability of IPM technology;
- Identify training needs for farmers and extension agents; and
- Respect and use local knowledge.

#### ***Step 2. Identify key pests for each target crop***

- Become familiar with key pests of target crops and the damage they cause; and
- Correctly identify the common pest.

#### ***Step 3. Monitor the fields regularly***

- Inspect crops regularly to determine the level of pests and natural enemies;
- Solicit assistance of agricultural extension staff if necessary; and
- Determine when crop protection measures, perhaps including pesticides are necessary.

#### ***Step 4. Select appropriate blend of IPM tools***

- Maximize the effectiveness of traditional and introduced non-chemical control techniques;
- Use pesticides only if no practical, effective and economic non-chemical control methods are available;
- Examples of Non-chemical Pest Management Techniques include:
  - Maintaining good soil fertility and a diverse agroecosystem;
  - Plant resistant crop varieties;
  - Selecting proper plant varieties for location and season;
  - Rotating crops;

- Planting clean seed;
- Correct planting and harvest periods;
- Proper irrigation methods;
- Correct fertilizer and rates;
- Good crop sanitation;
- Hand picking of larger pests;
- Use of natural control agents (biological control); an

***Step 5. Develop education, training, and demonstration programs for extension workers***

- Conduct hands-on training of farmers in farmers' fields (as opposed to a classroom);
- Use the participatory "Farmers' Field School" approach; and
- Conduct special training for extension workers, government officials and the public.

***Format for a Comprehensive Pest Management Plan***

A comprehensive pest management plan (PMP) should contain, but not be limited to, the following information:

1. Introduction
  - 1.1 Pest and pesticides management implications of project activities;
  - 1.2 Environmental consequences of pest management practices;
2. Pest management approaches used in country;
  - 2.1 Overview of forest, livestock and crop management problems;
  - 2.2 Current crop/pest management approaches;
  - 2.3 IPM experience;
3. Pesticide use and management;
  - 3.1 Pesticide use in country;
  - 3.2 Circumstances of pesticide use and competence to handle chemical products;
  - 3.3 Assessment of risks;
  - 3.4 Promoting IPM/ICM in the context of current practices;
4. Policy, regulatory framework and institutional capacity;
  - 4.1 Plant protection policy;
  - 4.2 National capacity to develop and implement IPM/ICM (IPPM);
  - 4.3 Control of the distribution and use of pesticides;
5. Implementing the pest management plan (PMP);
  - 5.1 Strengthening national capacities;
  - 5.2 Activities of the PMP;
6. Actors and partners;
7. Institutional arrangements for implementation of the PMP;
8. Phasing plan;
9. Sustainability;

10. Monitoring and evaluation;

11. Budget estimates.

Annex 1. List of pesticides approved for importation and use in country;

Annex 2. Documents consulted in the preparation of this PMP;

Annex 3. Key contacts/persons encountered.

## Annex 2: Environmental Screening Form and Checklist

The Environmental Screening Form (ESF) has been designed to assist in the evaluation of activities in EAAPP. The form is designed to assist in identification of potential environmental impacts so that mitigation measures, if any, can be identified and the need or requirements for preparation of an Environmental Management Plan be determined.

<b>Environmental Screening Form (ESF)</b>	
<b>Name of Sub project/Activity:</b>	
<b>Name, department, job title, for the person who is responsible for filling out this form</b>	
<b>Contact details (Telephone and email)</b>	
<b>Date</b>	
<b>Signature</b>	
<b>1. Sub project Description</b>	
Please provide information on the type and scale of the sub project, sub project area, area of plants and buildings, involvement of transgenic crops, amount of waste (solid, liquid and air generation), location and lengths of channel networks, buried and or surface located pipes, etc.) including construction work areas and access roads. (Complete on a separate sheet of paper if necessary).	
<b>2. Transgenic Crops</b>	
Would the sub-project involve research and testing on transgenic crops?  Yes _____ No _____	
<b>3. Pesticides</b>	
Would the sub-project activity involve the use of chemical pesticides?  Yes _____ No _____	
<b>4. The Natural Environment</b>	
Would a significant amount of vegetation/trees need to be cleared as part of the sub-project activity?  Yes _____ No _____	
<b>5. Water quality</b>	
Is there a possibility that, due to installation of structures, such as weirs and other irrigation structures, that river ecology or water quality will be adversely affected?  Yes _____ No _____	
<b>6. Geology and Soils</b>	
Based on visual inspection or available literature, are there areas of possible geologic or soil instability (erosion prone, landslide prone, subsidence-prone)?  Yes _____ No _____	

<b>Environmental Screening Form (ESF)</b>
<b>7. Solid or Liquid Wastes</b>
Will the sub-project generate solid or liquid wastes?  Yes _____ No _____  If “Yes”, does the sub project include a plan for their adequate collection and disposal?  Yes _____ No _____
<b>8. Landscape/aesthetics</b>
Is there a possibility that the sub project will adversely affect the aesthetic attractiveness of the local landscape?  Yes _____ No _____
<b>9. Noise pollution during Construction and Operations</b>
Will the operating noise level exceed the allowable decibel level for that zone?  Yes _____ No _____
<b>10. Displacement of Livelihoods</b>
Will the sub-project activity displace any existing dwellings or economic activity (e.g. growing of crops, use of water), even if they are using land or other resources illegally?  Yes _____ No _____
<b>11. Preparation of EMP</b>
<b>If any of the above questions is answered YES, an EMP must be prepared</b>

### **Annex 3: Guidelines for an Environmental Management Plan (EMP)**

The EMP would have the following format:

1. **Description of adverse impacts:** The anticipated impacts are identified and summarized.
2. **Description of Mitigation Measure:** Each measure is described with reference to the effects it is intended to deal with. As needed, detailed plans, designs, equipment description, and operating procedures are described.
3. **Description of monitoring program:** Monitoring provides information on the occurrence of impacts. It helps identify how well mitigation measures are working, and where better mitigation may be needed. The monitoring program should identify what information will be collected, how, where and how often. It should also indicate at what level of effect there will be a need for further mitigation. How environmental impacts are monitored is discussed below.
4. **Responsibilities:** The people, groups, or organizations that will carry out the mitigation and monitoring activities are defined, as well as to whom they report and are responsible. There may be a need to train people to carry out these responsibilities, and to provide them with equipment and supplies.
5. **Implementation Schedule:** The timing, frequency and duration of mitigation measure and monitoring are specified in an implementation schedule, and linked to the overall sub project schedule.
6. **Cost Estimates and Source of Funds:** These are specified for the mitigation and monitoring activities as a sub project is implemented.
7. **Monitoring methods:** Methods for monitoring the implementation of mitigation measures or environmental impacts should be as simple as possible, consistent with collecting useful information, so that the sub project implementer can apply them. For instance, they could just be regular observations of the sub project activities or sites during construction and then when in use. Are plant/equipment being maintained and damages repaired, does a water source look muddier/cloudier different than it should, if so, why and where is the potential source of contamination. Most observations of inappropriate behavior or adverse impacts should lead to common sense solutions. In some case, e.g. transgenic crops, there may be need to require investigation by a technically qualified person.