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# ENVIRONMENTAL MONITORING AND MITIGATION REPORT (EMMR)

**TASK ORDER NO. AID-623-I-10-00001**

## **NAFAKA Staples Value Chain Activity**

**February 27, 2013**

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### **DISCLAIMER**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

# TABLE OF CONTENTS

- 1. EMMR PART 1 OF 3: ENVIRONMENTAL VERIFICATION FORM.....3
- 2. EMMR PART 2 OF 3: ENVIRONMENTAL MITIGATION AND MONITORING PLAN (EMMP)..... 4
  - 2.1. PROJECT BACKGROUND ..... 4
  - 2.2. DESCRIPTION OF ACTIVITIES ..... 4
  - 2.3. BASELINE INFORMATION ..... 5
  - 2.4. EVALUATION OF PROJECT ACTIVITIES WITH RESPECT TO ENVIRONMENTAL IMPACT POTENTIAL ..... 7
  - 2.5. RECOMMENDED THRESHOLD DECISIONS & MITIGATION ACTIONS..... 8
- 3. EMMR PART 3 OF 3: SAFER USE ACTION PLAN (SUAP) ..... 17
  - 3.1. SAFER USE ACTION PLAN (SUAP) RESULTS FRAMEWORK ..... 17
  - 3.2. SAFER USE ACTION PLAN (SUAP) ..... 18
  - 3.3. SUAP TRAINING SCHEDULE..... 19
- 4. REFERENCES ..... 20

# I. EMMR PART I OF 3: ENVIRONMENTAL VERIFICATION FORM

**USAID/Tanzania Award Name:** NAFKA Staples Value Chain Activity

**Name of Prime Implementing Organization:** ACDI/VOCA

**Name of Sub-awardee Organization (if this EMMR is for a sub):** N/A

**Geographic location of USAID-funded activities (Province, District):** Tanzania: Kilombero, Mvomero, Kongwa, Kiteto, Zanzibar

**Date of Screening:** December 15, 2012

**Funding Period for this award:** FY 2011 – FY 2016

**Current FY Resource Levels:** FY 2014

**This report prepared by:** ACDI/VOCA      **Date:** January 15, 2013

**Date of Previous EMMR for this organization (if any):** N/A

Indicate which activities your organization is implementing under EG funding

*Key Elements of Program/Activities Implemented*

Activity Group	Group Description	Yes	No
1	Technical assistance, training, training modules development, capacity building, workshops, media events, radio programs, creating awareness, organizational strengthening, civic education, policy reforms, legal and social services, and development of business plans and strategies	X	
2	Micro credit, loans, MFIs and micro enterprises; loan guarantees, DCAs	X	
3	Biotechnology		
4	Fertilizers, pesticides, new agricultural productivity technologies, planting materials, seeds and construction	X	
5	Water, Sanitation and Hygiene Activities		
6	Sub-grants	X	
7	Other activities that are not covered by the above categories	X	

## 2. EMMR PART 2 OF 3: ENVIRONMENTAL MITIGATION AND MONITORING PLAN (EMMP)

### 2.1. PROJECT BACKGROUND

NAFAKA Staples Value Chain Activity is a Task Order released under the Support for Food Security Activities (SFSA) IQC. NAFKA is strengthening the rice and maize value chains and improving the productivity of smallholder farmers in crops that can be used for both income generation and consumption. The project is increasing the availability and access to food and improving utilization of food crops at the household level.

NAFAKA interventions focus primarily in the geographic regions aligned with the Southern Agricultural Growth Corridor (SAGCOT): Kilombero and Mvomero districts in Morogoro. NAFKA also serves Kiteto district in Manyara and Kongwa district in Dodoma, as well as Zanzibar.

### 2.2. DESCRIPTION OF ACTIVITIES

The project main components include:

#### **Value Chain Analysis and Strategy Development**

NAFAKA strengthens the rice and maize value chains through a participatory process involving value chain coordination committees and other GoT Ministry of Agriculture supported commodity working groups. Based on these analyses, NAFKA engages in maize and rice strategies involving interventions addressing or mitigating critical constraints and creating incentives for investment.

#### **Improved Competitiveness and Trade**

NAFAKA reduces uncertainty and encourages greater investments by strengthening the enabling environment for trade, facilitating win-win demonstration initiatives, and buying down risk of private actors. NAFKA addresses market functions throughout the value chains by improving maize and rice competitiveness. Incentives are facilitated for value chain actors to adopt new ways of conducting businesses resulting in increased competitiveness in the rice and maize sub-sectors.

#### **Improved Productivity**

NAFAKA coordinates public and private extension services to improve smallholder productivity. This is designed to strengthen these services so they are capable of continuing after the completion of the project and owned and controlled by producer organizations. These services include knowledge and technology transfer through Farmer Field Schools (FFS) and value chain demonstration farms. Demonstration farms exhibit technologies and techniques such as integrated soil fertility management, integrated production and pest management, on-farm water management, urea-deep placement, post-harvest handling, on-farm storage and product processing.

#### **Increased Income for Vulnerable Smallholders**

NAFAKA provides incentives for vulnerable individuals and groups to engage in viable value chains. These vulnerable stakeholders are assisted to building robust marketing groups to increase their capacity to generate assets, capital, skills and knowledge. Furthermore, NAFKA enables households to

benefit from increased incomes while ensuring adequate nutrition for families by integrating innovative behavior change and ICT solutions.

### **Increased Investment and Innovation**

A small grants fund buys down the risk of value chain actors to adopt new technologies and practices. Throughout all components, the project team emphasizes gender-inclusive, nutrition-focused and NRM-sensitive behavior change practices. Through these interventions, food security for producers and consumers is improved via increased access, availability and utilization of staple foods.

## **2.3. BASELINE INFORMATION**

### **2.3.1. Rice**

The project is working on increasing rice production in Morogoro Region, in Kilombero and Mvomero Districts. The Kilombero District is predominantly rural with the semi-urban district headquarter Ifakara as major settlement. The majority of the villagers are subsistence farmers of maize and rice.

*Kilombero District* is one of six Districts of Morogoro Region. The Kilombero District has about 400,000 hectares of a plain land suitable for agriculture activities such as farming, fishing, and animal husbandry. Most of the District is situated along Kilombero Valley a part of Rufiji Basin which extends below the Udzungwa mountains from east towards the southwest. The greater part of the Kilombero Valley consists of large alluvial plains situated at an elevation of slightly less than 300 meters above sea level.

*Mvomero district* has been established as recently as 2008 in the Morogoro region. The altitude of district is between 380 meters and 1,520 meters above sea level. The district's economy like most of Morogoro districts depends on agriculture, mainly from crop production.

*The southern corridor.* The majority of the population in the southern corridor lives in rural areas and is engaged in agriculture, pastoralism and/or fishing. The corridor is an important rice producing area. Rice is grown under three major ecosystems - rain-fed lowland, upland rice and irrigated. Most of the farms in the area are small, rain-fed, and use traditional techniques.

Particularly in the Kilombero valley, rain-fed rice is grown predominately in alluvial river valleys with fertile clay soils. Rice cultivation is carried out mainly by use of the hand hoe, using primarily family labor and hired labor when the situation demands. Livestock is kept for draught, but the practice is not extensive. Overall, the level of mechanization in farming is fairly low. According to the SACGOT report, fewer than 5% of farmers own their own machinery, while 60% of farmers are reported to have the means to hire machinery (estimated cost of TZS 45,000/acre).

Rice production is the most important crop in the area and is commonly grown alongside maize. It is reported that in the past the area enjoyed a reliable rainfall, which according to farmers is now becoming less reliable. Unreliable rainfall and high climate variability are making farming a highly risky enterprises, thus farmers opt for low input technology. Small irrigation systems are found in the area but there is currently very limited large scale irrigated farming in the southern corridor.

The average land holding among small holder farmers in the Kilombero Valley is 2 to 5 acres. Traditionally, an average of 2 acres was farmed, while the remainder was left fallow allowing for shifting cultivation. Population growth and growing demand for food is contributing to pressure on land under cultivation and reduction of fallow periods. Slash-and-burn farming practices are leaving swaths of

unusable land. The deforestation and poor land use practices cause soil erosion and siltation of waterways. The Selous Game Reserve, Mikumi National Park and Udzungwa Mountains National Park are located in this area. As in other parts of Tanzania, expanding agriculture at the expense of forests and woodlands poses a threat to game reserves and national parks. Increasing pressure on land is leading to conflicts between resident crop farmers and incoming pastoralists and agro-pastoralists.

As in other areas of Tanzania, purchased inputs are not widely used in Tanzania. It is estimated by the last National Sample Census of Agriculture that about 15% of farmers use chemical fertilizers, 27% use improved seed and 18% use pesticides. Yields are generally low and postharvest losses high.

Small to medium rice milling industries in the area employ a small percentage of the population but are important in adding value to and marketing agricultural produce. The milling operators are concentrated in urban areas and trading centers. The operations produce large amounts of rice husks that go to waste and contribute to pollution.

### **2.3.2. Maize**

The project is working with maize producers in Mvomero and in central Tanzania. The central area of Tanzania has some of the most drought prone regions such as Kongwa, districts of the Dodoma Region and Kiteto, one of districts of the Manyara Region. The project is also making plans for working in Zanzibar.

The semi-arid areas of central Tanzania, Dodoma in particular, receive less than 500mm rainfall per year. Population increases are pushing maize production into marginal production areas with little rainfall. Irrigation that could support maize production in these areas is underdeveloped and expensive to operate by poor communities. The overall agricultural output is low and the natural resource base is depleting at an alarming rate. Droughts are a common feature in the villages resulting in frequent famine. Much of the rain is lost through runoff.

In lowland plains soils are mostly dark, sticky cracking clays and friable and calcareous clays. Organic matter levels in these soils are low and the soils are susceptible to erosion. Most of the soils in this semi-arid area are poor, degraded and have low nutrient reserves resulting in general soil infertility. When crops are harvested, nutrients are invariably removed. It is virtually impossible, therefore, to maintain or increase crop production without continuous addition of nutrients.

In this area, use of ox drawn plough accounts for most of draught power use. Household animals are a source of farmyard manure or it is purchased from pastoralists. Resource poor farmers have limited access not only to inorganic, but also to organic fertilizers. Thus very little animal manure is being used for crop production. One of the major reasons for underutilization of animal manure for crop production has been found to be lack of technical know-how by most of the farmers in terms of application rates, storage techniques and appropriate manure application methods. Other factors are long distance from the manure source to the fields and poor transport facilities.

The land degradation is further exacerbated by removal of native vegetation. Despite government laws, the main farming method used continue to be slash-and-burn, where the bush forest is cut down and then cleared by burning to form farmland. In the past the cleared land was farmed for a few years and then left fallow to recover, but today the recovery periods are not practiced and therefore the land is being much more heavily used than in the past. These changes are not sustainable and they lead to land degradation and increased conflicts over land and water resources.

Increasing population pressure compounded by increasing number of dry spells are leading communities into uncontrolled and unskilled land exploitation. Climate change predictions suggest that changes to temperature and precipitation are likely to have large economic impacts on agricultural sector in this area. Severe impacts have been predicted for maize crops with very high yield losses.

Aflatoxin contaminated maize is consumed and marketed and farmers are at high risk of exposure. Pre-harvest grain aflatoxin contamination is associated with drought and high temperatures during grain fill. Postharvest aflatoxin contamination can develop when grain is improperly managed through the drying and storage process

### **2.3.3. Vegetable gardens**

Women farmers that have established their own vegetable gardens are usually growing them on small plots. Mostly the produce is organically grown and has positive impact on family diet. The home gardens are in general considered an environmentally friendly activity. However intensification of agricultural production and increased use of agricultural inputs can have adverse impacts on the local environment.

*The crop selection in Zanzibar is still in the planning stage.* Zanzibar is considered an area with strong potential for developing agriculture because of its fertile soils and rainfall that can support crop production. However its increasing population is placing pressure on environment. Some of the main issues that limit environmental sustainability include large scale encroachment on forest areas from farming.

## **2.4. EVALUATION OF PROJECT ACTIVITIES WITH RESPECT TO ENVIRONMENTAL IMPACT POTENTIAL**

*Intensification of agricultural production:* Potential impacts of project activities can be associated with intensification of agricultural production, particularly if the adoption of farming practices and technologies by farmers are not adequate. The impacts may include increased land under agricultural production through land clearing and deforestation and resulting biodiversity losses, increased erosion and sedimentation into local water sources. In the absence of adoption of sustainable farming practices intensification of rice production can contribute to increased greenhouse effect and maize mono-cropping and poor production techniques can contribute to soil depletion and land degradation. Intensification of agricultural production can also have social impacts including increased conflicts over land and water ownership and use.

*Increased use of inorganic fertilizers:* Risks associated with poor handling, application and storage of fertilizers include surface and groundwater contamination, air pollution, greenhouse effect, land degradation and in some cases adverse health effects. Pollution from fertilizers can occur when application rate exceed the absorption capacity of the crops or when they are washed or blown off the soil surface before they can be incorporated. Excess nitrogen or phosphates can leach into the groundwater or run off into the waterways. Nutrient overload can foster algae growth thus negatively affecting other aquatic organisms. Organic fertilizers are better absorbed into the soil but excessive application near water sources can contribute to pollution. In some areas, however the lack of fertilizer has greater negative environmental consequences than in increased use of inorganic fertilizer.

*Introducing new and pesticide coated seed varieties:* Agronomic, economic and nutritional risks are inherent to introducing new seed varieties. Possible negative impacts on the environment may result when traditional varieties are replaced by smaller range of new varieties of seeds, resulting in replacement of

indigenous germplasm and biodiversity loss. Improved seeds may require more water or fertilizer and pesticide coated seeds can be ingested by birds and animals or can be ingested by people.

*Introducing irrigation and water management technologies:* Impacts associated with intensifying irrigation can include water depletion and pollution, water use conflicts, soil salinization, standing water pools that generate vectors of disease, and gas and oil pollution resulting from use of oil pumps.

*Introducing pesticides:* Pesticides can have adverse effects on non-target organisms including posing danger to human health. Pesticides can pollute and damage the environment, including by persisting in non-target ecosystems. Use of pesticides can lead to resistance and resurgence of pests. Pesticide risks are amplified due to poor product quality and lack of good pesticide management practices.

*Improving post-harvest practices:* Impacts associated with rice and maize post-harvest practices may include pesticide use related risks associated with fumigation of stored commodities, and air pollution and workers health and safety concerns associated with transporting and warehousing. Impacts associated with rice milling may include air and noise pollution, risks from working with mechanized equipment and generation of solid waste. Improper maize processing and storage practices may be associated with higher levels of aflatoxin exposure.

*Introducing mechanization:* Impacts associated with use of machinery can include soil compaction, increased soil erosion and siltation, particularly when machinery is used on slopes, pollution of air, water and soil with fuel and oil, improperly discarded mechanical parts and health and safety risks to operators and bystanders.

*Providing grants and improving access to credit:* Grants and access to credit activities will support improved access to agricultural inputs. Therefore impacts of these activities will be associated with increased access to agricultural inputs addressed above.

## **2.5. RECOMMENDED THRESHOLD DECISIONS & MITIGATION ACTIONS**

Threshold recommendations of this EMMR are based on Initial Environmental Examination (IEE):

*Program Number:* SO 12

*Country/Region:* Tanzania/East Africa

*Program/Project Title:* Feed the Future: Increase Household Food Security, Nutrition and Incomes

*Functional Objective 4:* Economic Growth

Proposed mitigation actions are described in the following EMMP table:

### 2.5.1. Environmental Mitigation and Monitoring Plan (EMMP)

Activity and sub-activity	Impacts	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
1. Education, technical assistance, training, etc.	No adverse environmental impacts are anticipated as a result of these activities.	Education, technical assistance and training about activities that inherently affect the environment will include discussion of prevention and mitigation of potential negative environmental effects. Introduce Behavior Change Communications (BCC) training and environmental and climate change awareness building into all training activities.	Environmental Compliance and Natural Resources Specialist (ECNRS) and BCC teams.	Discussion of environmental impact included in education, technical assistance, training and other materials.	Review of training materials.	Quarterly
2. Access to micro credit, loans, MFIs and micro enterprises; Loan guarantees, DCAs.	Impacts associated with facilitating access to agricultural inputs.	Ensuring that input suppliers and agro-dealers have environmental screening system that is sufficient to demonstrate compliance with US and local environmental laws. Ensuring that they have policies and procedures to assure that project-facilitated finance supports activities that are environmentally sound. Provide training in safe use of inputs to integrate environmental compliance into access to finance.	ECNRS and Access to Finance Specialist.	% of financial institutions that have environmental compliance policies and procedures.	Interviews	Semi-Annually
3. Sub-grants	Impact associated with supporting access to agricultural inputs.	Environmental compliance will be integrated into grants policies and the grants manual. All sub-grant programs will include use of the USAID/ Africa Bureau Environmental Review and Report Screening Form in their sub-grant procedures.	ECNRS and Grants Manager.	Environmental compliance integrated into the grants process.	Review of grants materials.	Semi-Annually

Activity and sub-activity	Impacts	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
<p>4. Increasing agricultural productivity/ Establishing demo plots For:</p> <ul style="list-style-type: none"> <li>• Maize</li> <li>• Rice</li> <li>• Vegetable home gardens</li> </ul>	<p>Associated with intensification of agricultural production such as:</p> <ul style="list-style-type: none"> <li>• Increasing area under agricultural production.</li> <li>• Land clearing and deforestation.</li> <li>• Increased erosion and sedimentation.</li> <li>• Threats to biodiversity.</li> <li>• Increased conflicts over land ownership and use.</li> </ul> <p>Crop specific:</p> <ul style="list-style-type: none"> <li>• Rice: Paddy rice production contributes to greenhouse effect.</li> <li>• Maize: Mono-cropping and poor maize production techniques contribute to soil depletion.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased productivity will minimize the need for expanding land under cultivation thus reducing negative impacts of slash-and-burn practices. Use of mechanization and draft power will reduce the need for slash-and-burn.</li> <li>• Demonstration farms are established on already cleared existing plots. Farmers trained to clear land in sustainable manner and are sensitized to negative impacts of using slash-and- burn. Farmers are encouraged to plant trees around plots to minimize soil erosion.</li> <li>• The project will disseminate knowledge on agricultural conservation practices including: <ul style="list-style-type: none"> <li>○ <i>Rice</i>: Sustainable Rice Intensification (SRI) technology that involves sustainable land preparation, improved seed selection and spacing, proper fertilizer application, weed control using rotary weeders and harvest technology.</li> <li>○ <i>Maize</i>: Reduced tillage techniques, maize residue management, seed selection , planning in lines and spacing, raised beds and intercropping with legumes, minimizing the likelihood of developing aflatoxin problem by using sound agronomic practices.</li> <li>○ <i>Vegetable gardens</i>: Proper site selection and crop planning; land preparation techniques and growing cover crops, water and soil nutrition management; integrated pest management, and nutritional value of vegetables.</li> </ul> </li> </ul>	<p>ECNRS and Productivity Teams and partners.</p>	<ul style="list-style-type: none"> <li>• % of demo plots established using sustainable practices.</li> <li>• # of sustainable technologies introduced.</li> <li>• # of acres under sustainable production.</li> </ul>	<p>Field visits and interviews with farmers.</p>	<p>Annually</p>

Activity and sub-activity	Impacts	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
5. Increasing agricultural productivity/using fertilizer	<ul style="list-style-type: none"> <li>• Risks associated with poor handling, application and storage:               <ul style="list-style-type: none"> <li>○ Surface and groundwater contamination.</li> <li>○ Algae growth reducing oxygen and creating dead zones.</li> <li>○ Air pollution; Greenhouse effect.</li> <li>○ Land degradation.</li> <li>○ Adverse health effects.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Follow USAID guidelines described by <a href="http://www.encapafrica.org/egssaa/AFR_Fertilizer_Factsheet_Jun04.pdf">http://www.encapafrica.org/egssaa/AFR_Fertilizer_Factsheet_Jun04.pdf</a>. Including:               <ul style="list-style-type: none"> <li>○ Using the minimum amount of fertilizer.</li> <li>○ Annual testing of the soil allows for assessing the precise amount required.</li> <li>○ Fertilizer should be applied at the right time in the right way for the crop in question.</li> <li>○ Extra care with fertilizer should be taken on slopes and near natural bodies of water.</li> <li>○ Organic alternatives such as compost or manure are a safer option and further reduce, or even eliminate, the need for chemical fertilizers.</li> <li>○ Fertilizers must be safely handled and stored away from the elements.</li> </ul> </li> <li>• Training will be provided to field productivity teams, partners, agro-dealers and beneficiaries in soil fertility management.</li> <li>• <i>Vegetable home gardens</i>: Build awareness about risks of eating unwashed vegetables, particularly when fertilizers are used in production.</li> <li>• <i>Rice</i>: The project is introducing Urea Deep Placement (UDP) to rice growers and targeted application technologies that reduce pollution by minimizing nitrogen loss.</li> </ul>	ECNRS and Productivity Teams and partners.	# of farmers trained in soil fertility management and proper fertilizer handling, application and storing techniques.	Training records.	Semi-annually

Activity and sub-activity	Impacts	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
<p>6. Increasing agricultural productivity/ Introducing new seeds.</p>	<ul style="list-style-type: none"> <li>• Introduction of non-native seeds carries a potential risk of introducing invasive species and threat to biodiversity.</li> <li>• Use of poor quality seed increases the risk of seedling diseases.</li> <li>• Impacts of introducing treated /dressed seeds are associated with pesticides use and increased risks of pesticide ingestion by birds, animals and people.</li> </ul>	<ul style="list-style-type: none"> <li>• Non-native plants will not be introduced into protected areas.</li> <li>• The project will: <ul style="list-style-type: none"> <li>○ Ensure appropriateness for the agro-climatic zone to which they are being introduced.</li> <li>○ Avoid introducing exotic invasive species.</li> <li>○ Avoid providing or promoting genetically modified organisms (GMOs).</li> </ul> </li> <li>• Only seed varieties that were approved by the Tanzania Official Seed Certification Institute (TOSCI) will be introduced.</li> <li>• Where the project introduces treated/dressed seed, only seeds treated with PERSUAP approved pesticides will be used at demonstration farms and promoted to farmers.</li> <li>• The project will build awareness of the risks associated with consuming treated seeds by birds, animals and people, especially children.</li> <li>• The project will provide training to farmers on seed germination testing and benefits of nursery versus direct seedling.</li> </ul>	<p>ECNRS and Productivity Teams and partners.</p>	<ul style="list-style-type: none"> <li>• All seeds are procured from certified sources.</li> <li>• All seeds are treated with PERSUAP approved pesticides.</li> <li>• % of farmers receiving dressed/treated seeds that were sensitized to the risks.</li> </ul>	<p>Review of seed certification and seed treatment.</p>	<p>Ongoing</p>

Activity and sub-activity	Impacts	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
7. Increasing agricultural productivity/ Introducing irrigation and water management technology	Impacts associated with irrigation can include water depletion and pollution, water use conflicts, soil salinization, standing water pools generating vectors of disease and pollution resulting from use of oil pumps.	<p>To Addressing water scarcity and changing rain patterns, the project will be:</p> <ul style="list-style-type: none"> <li>• Collecting rainfall data and introducing rain gauges to improve water use planning and to adjust sowing and cultivation schedules.</li> <li>• Introducing water user cooperatives will improve water management and utilization.</li> <li>• Training will be provided in improved water management technologies and techniques including creating soil contour bunds for better water control management.</li> <li>• Training will be provided in water distribution and drainage techniques and efficient management of pump stations.</li> <li>• Training on rain water harvesting will be provided in the rice irrigation schemes</li> <li>• Hydrological data will be gathered from the local government, where available.</li> </ul>	ECNRS and Productivity Teams and partners.	<ul style="list-style-type: none"> <li>• # of farmers trained on improved water management techniques and technologies.</li> <li>• # of water user associations developed.</li> <li>• # of farmers adopting water harvesting technology.</li> </ul>	<ul style="list-style-type: none"> <li>• Training records</li> <li>• Field visits and interviews with farmers</li> </ul>	Ongoing

Activity and sub-activity	Impacts	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
8. Increasing agricultural productivity/ Introducing pesticides	<ul style="list-style-type: none"> <li>• Pesticides can have:               <ul style="list-style-type: none"> <li>○ Adverse effects on non-target organisms.</li> <li>○ Can be dangerous to human health.</li> <li>○ Pollute and damage non-target ecosystems</li> <li>○ Persist/ Accumulate in the environment.</li> <li>○ Lead to resistance and to resurgence of pests.</li> </ul> </li> <li>• Pesticide risks are amplified due to:               <ul style="list-style-type: none"> <li>○ Poor product quality.</li> <li>○ Improper labeling and packaging.</li> <li>○ Improper handling and application.</li> <li>○ Improper transportation and storage.</li> <li>○ Improper disposal.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Following USAID guidelines per USAID Regulation 22 CFR 216.3(b) (1).</li> <li>• PERSUAP has been prepared and approved by USAID for NAFKA. The Project will:               <ul style="list-style-type: none"> <li>○ Implement all conditions of the PERSUAP, including safer use training and training in Integrated Pest Management (IPM).</li> <li>○ Build awareness about human health and environmental risks associated with pesticides and provide necessary training to farmers in mitigating risks.</li> <li>○ Promote formation and use of professional pesticide applicators including working with youth groups.</li> <li>○ Inform local health offices to ensure that they have the necessary knowledge to address any emergency cases related to pesticide poisoning.</li> <li>○ Build awareness about risks inherent in ingesting seeds and produce treated with pesticides and steps to avoid/minimize these risks.</li> </ul> </li> </ul>	ECNRS and Productivity Teams and partners.	SUAP indicators	Field visits, pesticide monitoring records, training records.	Quarterly

Activity and sub-activity	Impacts	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
<p>9. Increasing agricultural productivity/ Postharvest activities</p>	<ul style="list-style-type: none"> <li>• Pest infestation of stored commodities may require use of hazardous pesticides.</li> <li>• Particle air pollution from stored commodities and from dust.</li> <li>• Human health and safety concerns associated with working environment.</li> <li>• Rice: Impacts associated with rice milling including air pollution, human health and safety, generation of solid waste.</li> <li>• Maize: Impacts associated with increased levels of aflatoxin in grain.</li> </ul>	<ul style="list-style-type: none"> <li>• When using pesticides following USAID guidelines per USAID Regulation 22 CFR 216.3(b)(1) PERSUAP has been prepared and approved by USAID for NAFKA. The Project will implement all conditions of the PERSUAP.</li> <li>• The project will build awareness about human health and environmental risks associated with pesticides and ensure that use of Restricted Use Pesticides (RUP) is by certified/trained professionals only.</li> <li>• Warehouse managers are trained in infestation prevention techniques including storing commodities away from the walls, placing bags on pallets, routine cleaning and inspection.</li> <li>• Warehouse staff will be issued Personal Protective Equipment (PPE).</li> <li>• Rice milling: Use of PPE during the milling process; Training of mill operators in good housekeeping and safety procedures; Removing and recycling rice husks.</li> <li>• Maize storage: Minimizing aflatoxin levels by properly storing and drying grain, maintaining grain quality, and sanitizing grain-handling equipment. Building awareness on aflatoxin effects on animals and humans and preventive measures.</li> </ul>	<p>ECNRS, Productivity Team, Post-harvest Specialist, Marketing Linkages Specialist.</p>	<ul style="list-style-type: none"> <li>• # of warehouse managers trained on the infestation prevention techniques.</li> <li>• # of PPE distributed to warehouse staff.</li> <li>• # of staff and farmers that received trained on effects of aflatoxin and preventive measures.</li> </ul>	<ul style="list-style-type: none"> <li>• Training records.</li> <li>• Field visits and interviews with farmers and warehouse staff.</li> </ul>	<p>Semi-annually</p>

Activity and sub-activity	Impacts	Description of Mitigation Measures	Who is responsible for monitoring	Monitoring Indicator	Monitoring Method	Frequency of Monitoring
10. Increasing agricultural productivity/Introducing mechanization	Impacts associated with use of machinery can include soil compaction, increased soil erosion and sedimentation, particularly when machinery is used on slopes, pollution of air, water and soil with fuel and oil, improperly discarded mechanical parts and health and safety risks to operators and bystanders.	<ul style="list-style-type: none"> <li>Ensuring that farmers understand the connection between machinery uses, type of terrain on which it is used and impacts on soil.</li> <li>Provide training in proper and safe operation and maintenance of mechanical equipment including cleaning of oil spills. Ensuring availability of spare parts.</li> </ul>	ECNRS and productivity teams and partners.	# of farmers trained in proper operation and maintenance of mechanized equipment.	Training records.	Annually

### 3. EMMR PART 3 OF 3: SAFER USE ACTION PLAN (SUAP)

#### 3.1. SAFER USE ACTION PLAN (SUAP) RESULTS FRAMEWORK

Expected results:	Recommended activities:
<ul style="list-style-type: none"> <li>Professional pest control services established.</li> <li>Container return program established in collaboration with GoT.</li> <li>Collaboration on development and implementation of crop specific Pest Management Plan (PMP) with the GoT.</li> </ul>	<ul style="list-style-type: none"> <li>Professional pest control services located, linked to producers, established and use of professional services promoted.</li> <li>Collaboration with GoT established including promotion of container return programs.</li> <li>Tanzania PMP will be reviewed and discussed with the team.</li> </ul>
Expected results:	Required activities:
List of approved pesticides and Pesticide Materials Safety Data Sheets (MSDS) distributed to users.	Pesticide Materials Safety Data Sheets (MSDS) will be made available to all trainers.
Farmers understand MSDS and can read pesticide labels.	Simplified version of MSDS is prepared for beneficiaries. Training will be provided on MSDS and reading pesticide labels.
Personal Protective Equipment (PPE) for pesticide demonstrations is available and used.	<ul style="list-style-type: none"> <li>Sources of PPE will be established and users linked to these sources.</li> <li>Training will be provided on cleaning and maintenance of PPE.</li> </ul>
Environmental conditions, under which pesticides are applied, are assessed and monitored.	Where pesticides will be applied, available environmental baseline information will be gathered through observation, testing and gathering data from the local government. Users will be trained to monitor conditions under which pesticides are applied, including weather conditions, hydrology, topography, proximity to people, and potential effect on non-target organisms such as local plants, birds, animals and aquatic organisms.
Pesticide equipment calibrated, cleaned and maintained.	Training in Best Practices will be provided.
Best practices in preparation, mixing and application of pesticides are followed.	Training in Best Practices will be provided.
Best practices in handling, transporting, storing and disposing of pesticides and containers are followed.	Training in Best Practices will be provided.
Pesticide registration status changes with USEPA and TPRI are tracked.	Project environmental officer will track changes in status and communicate any changes to the implementing staff.
Users of pesticides are able to identify and monitor pest.	Training will be provided in identifying and monitoring pests and appropriate IPM measures including preventive practices and when pesticide must be used.
Records on pesticide procurement and use are kept.	<ul style="list-style-type: none"> <li>Logs for tracking pesticide use by the project and by the farmers will be designed, training in keeping records will be provided.</li> <li>Records of pesticide procurement and use are kept by the project.</li> <li>Farmers are trained to keep records of pesticide procurement and use.</li> </ul>
Farmers are able to monitor development of product resistance.	Farmers will be trained in IPM techniques that manage pesticide resistance and utilizing their records on pesticide procurement and use.

### 3.2. SAFER USE ACTION PLAN (SUAP)

Activity Results	Implementer	Timeline	Monitoring Indicator	Frequency	Responsible for Monitoring
MSDS's distributed to technical teams	ECNRS and Productivity Teams	Distributed By March 2013	All teams have MSDS sheets and materials based on MSDS's for farmers	Once	ECNRS Productivity Lead
Simplified MSDS prepared and distributed to farmers Farmers able to read and understand pesticide labels	Productivity team and ECNRS	By April 2013	# of farmers received the MSDS and who understands pesticides labels	On-going	ECNRS and Productivity team
Farmers are aware of risks to people and environment and the need for mitigation of risks	ECNRS and Productivity Teams	Ongoing	% of farmers that demonstrate improved understanding of pesticide risks and	Quarterly	ECNRS Productivity Teams
Linkages with professional pest services improved	ECNRS and Productivity Teams	Ongoing	# of linkages created	Ongoing	Productivity Lead
Access to PPE improved	Productivity Teams	Ongoing	% of increase in beneficiaries using PPE	Semi-annually	ECNRS
Farmers are using best practices in pesticide application and equipment and PPE maintenance	Productivity Teams and partners	Ongoing	# of beneficiaries trained	Quarterly	ECNRS
Farmers follow best practices in pesticide application	Productivity teams and partners	Ongoing	# of beneficiaries trained	Quarterly	ECNRS
Farmers follow best practices in handling, storage and disposal	Productivity teams and partners	Ongoing	# of beneficiaries trained	Quarterly	ECNRS
Training is implemented according to the schedule	ECNRS Productivity Team	Per training schedule	# of beneficiaries trained	Quarterly	ECNRS

### 3.3. SUAP TRAINING SCHEDULE

Training	Trainees	Trainers	Dates	Responsible for monitoring
Understanding Material Safety Data Sheets (MSDS)	Field staffs	Consultant- TPRI	Apr-13	Productivity/ECNRS
Understanding MSDS and labels	Farmers	Productivity team/ ECNRS	April 2013/Ongoing	Productivity /ECNRS
Access and use of Personal Protective Equipment(PPE)	Lead Farmers/VBAAs/ Agro-dealers	Productivity/ECNRS /Suppliers	By March 2013/Ongoing	Productivity/ECNRS
Equipment access, maintenance calibration	Lead Farmers/VBAAs, Agro dealers/field staffs	Input Supplier Companies	By March 2013	Productivity/ECNRS
Access, mixing, preparation, application	Lead Farmers/VBAAs ,Agro dealers/field staffs	Input Supplier Companies	By March 2013	Productivity/ECNRS
Handling in transfer, storage, disposal	Lead Farmers/VBAAs ,Agro dealers/field staffs	Consultant- TPRI	April 2013/	Productivity/ECNRS
Identifying and monitoring pests and identifying IPM measures	Lead Farmers/VBAAs ,Agro dealers/field staffs	Consultant- Entomologist	May- 2013	Productivity/ECNRS
Monitoring environmental conditions for safe application	Lead Farmers/VBAAs ,Agro dealers/field staffs	Productivity/ECNRS	August 2013/Ongoing	Productivity/ECNRS
Record keeping by project, partners and beneficiaries	Lead Farmers/VBAAs/ Agro dealers/field staffs	Productivity/ECNRS	March 2013/Ongoing	Productivity/ECNRS
Monitoring for resistance development	Field staffs/Agro-dealers	Consultant- Entomologist	August 2013	Productivity/ECNRS

## 4. REFERENCES

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