I. COVERSHEET FOR ENVIRONMENTAL MITIGATION PLAN & REPORT
(UMBRELLA EMPR: FLOOD CONTROL AND DRAINAGE)

USAID MISSION SO # and Title: _____

Title of IP Activity: _____

IP Name: __ _____

Funding Period: FY_____ - FY_____

Resource Levels (US$): _____

Report Prepared by: Name:_____ Date: _____

Date of Previous EMPR: _____ (if any)

Status of Fulfilling Mitigation Measures and Monitoring:

_____ Initial EMPR describing mitigation plan is attached (Yes or No).

_____ Annual EMPR describing status of mitigation measures is established and attached (Yes or No).

_____ Certain mitigation conditions could not be satisfied and remedial action has been provided within the EMPR (Yes or No).

USAID Mission Clearance of EMPR:

Contracting Officer's Technical Representative:_____ Date: _____

Mission Environmental Officer: _____ Date: _____
( )

Regional Environmental Advisor: _____ Date: _____
( )

***List of CHF Haiti projects covered in this UEMPR* (Flood Control and Drainage)**

1. Background, Rationale and Outputs/Results Expected:

According to Richard Haggerty's country study on Haiti from 1989, in 1925, 60% of Haiti's original forests covered the country. Since then, the population has cut down all but an estimated 2% of its original forest cover. The fact that many of Haiti's hillsides have been deforested has caused several flooding problems for cities and other communities located in critical watershed and flood-plain areas during recent hurricane seasons. The 2008 hurricane season was particularly devastating for Haiti, where over 800 people were killed by four consecutive tropical storms or hurricanes (Fay, Gustav, Hanna, and Ike) which also destroyed infrastructure and caused severe crop losses. In 2004, tropical storm Jeanne killed an estimated 3,000 people, most in Gonaives. Most of these deaths are direct results of flooding and mudslides.

In many urban areas of Haiti, solid waste management is rare, and drainage canals clogged with trash and sediment also contribute to flooding. Without adequate municipal maintenance or available funding, drainage canals are not periodically cleaned and become practically useless after some time, or create stagnant water leading to increased water-borne disease. Often times these canals are used for washing in various urban centers in Haiti, leading to potential skin disease and the ingestion of human pathogens.

CHF's USAID/KATA program is an $81 million, 4-year program that is designed to:

- Enable access to economic opportunities that provide people with dignity, income and the chance to contribute to the economic development of their country
- Enhance the government's ability to effectively respond to the needs of its constituents
- Provide improved access to capital, market linkages and investments for Haiti's micro, small and medium enterprises
- Increase access to social and productive infrastructure.

Through flood control and drainage projects, CHF hopes to achieve the following:

1) Provide protection to communities that are located along or near rivers with weakened and eroded river banks to prevent future flooding
2) Provide urban communities and market places with adequate drainage canals
3) Train community members on adequate trash disposal, canal maintenance, and water use practices to reduce risk of flooding and disease spread.

2. Activity Description:

This EMPR covers all activities directly related to the construction and/or rehabilitation of flood control measures, river bank stabilization structures and drainage canals. This includes: gabion construction, stone and concrete work, riverbank re-vegetation projects and construction/rehabilitation of drainage canals in urban and peri-urban areas.

Certain activities are common throughout all different types of flood control and drainage projects. The following are common activities throughout many of these projects:

1. Site selection and design

2. Sourcing of construction materials
3. General construction activities and decommissioning
4. Educational/training programs on maintenance

However, depending on the nature of the project type or subtype, there may be different project activities.

Activities specific to riverbank reinforcement projects may include:

a) Excavation/reshaping of riverbanks back to previous condition
b) Reinforcement/building back up of degraded river banks through gabion construction and backfilling, taking into account upstream and downstream hydrological effects
c) Re-vegetation of riverbanks with locally compatible grass or shrub species

Activities specific to rehabilitation of drainage canals:

a) Cement reinforcement of existing drainage canals
b) Extension and cement reinforcement of existing drainage canals
c) Rehabilitation or installation of accompanying structures (culverts, outlets etc.)
b) Cleaning and disposal of drainage canal debris
c) Creation of maintenance committees to perform routine cleanings and maintenance

3. Environmental Baseline:

The project will be implemented in 5 departments of Haiti, Petit Goâve, Port-au-Prince, Saint Marc, Gonaïves and Cap Haïtien. In most cases, any river work will follow the natural course of the river unless major damage due to storm events requires heavy excavation, large-scale gabion work, or relocation of human settlements to correct the problem. In these cases, an Environmental Assessment (EA) will be conducted prior to initiating river work. CHF will also maintain close contact with USAID officials regarding high-priority river work to ensure full compliance with Regulation 216.

Due to the increase of hurricane activity in recent years and the severe damages and loss of life that have resulted, the USAID/KATA program focuses much of its activity on watershed management and infrastructure improvement/rehabilitation activities. In USAID's 2007 report "Environmental Vulnerability in Haiti," Glenn Smucker and team point out that many of the environmental problems in Haiti can be attributed to, "acute poverty, rapid population growth and unplanned urbanization"(Smucker, iii). These factors have created a much higher and concentrated demand for firewood and charcoal among other natural resources and services in and around urban centers.

Not only does the indoor burning of charcoal worldwide account for the death of nearly 800,000 children and 500,000 women annually (WHO, 2006), but it is a main factor driving the deforestation of hill and mountainsides in Haiti. According to Richard Haggerty's country study on Haiti from 1989, in 1925, Haiti had 60% of its original forest covering the country. Since then, the population has cut down all but an estimated 2% of its original forest cover, and in the process has destroyed fertile farmland soils, contributing to desertification. Most important is the hillside deforestation, which has caused a slew of flooding

and mudslide problems for cities and other communities located in watershed and flood plain areas.

During the hurricane seasons of both 2004 and 2008, the flooding and mudslides in Gonaives provide examples of the types of indirect problems that result from hillside deforestation and poor watershed management. According to earthobservatory.nasa.gov, "in September 2004, more than 2,500 people died when Tropical Storm Jeanne unleashed torrential rain on northeastern Haiti…The disaster was repeated in September 2008, when a string of storms—Gustav, Hanna, and Ike—drenched Haiti. Though the resulting floods were as extensive as in 2004, the death toll was not as great. As of September 15, 423 people had been reported dead, 50 were missing, and more than 100,000 were in shelters, said the United States Agency for International Development (USAID)."

The mudslides and flooding in Gonaives serve as a grim warning to the possibilities of what could be in the nation's capital, Port-Au-Prince, as both cities are located in large watersheds. Such floods and mudslides can contribute to a slew of other health, social and environmental problems ranging from road blockage, to drinking water contamination and disease spread.

The average annual rainfall is 140 to 200 centimeters, but it is unevenly distributed. Heavier rainfall occurs in the southern peninsula and in the northern plains and mountains. Rainfall decreases from east to west across the northern peninsula. The eastern central region receives a moderate amount of precipitation, while the western coast from the northern peninsula to Port-au-Prince, the capital, is relatively dry. Some regions have two rainy seasons, lasting from April to June and from August to October, whereas other regions experience rainfall from May to November. Annual variations of precipitation can cause droughts, widespread crop failures, and famine.

Temperatures are almost always high in the lowland areas, ranging from 15° C to 25° C in the winter and from 25° C to 35° C during the summer. Haiti is located on the leeward side of Hispaniola, which means that the influence of humid trade winds is not as great as in The Dominican Republic. The more humid districts are found on the northern and eastern slopes of the mountains.

Only 54% of the population in Haiti has broad definition access to potable water, while only 30% have access to sanitation coverage, according to a WHO/UNICEF report in 2006.

According to CIA world fact book, about 66% of all Haitians work in the agricultural sector, which consists mainly of subsistence farming on a small scale. Mangoes and coffee are the country's most important exports; however, agriculture only makes up 30% of the country's GDP.

In order to alleviate the pressures put upon the Haitian population due to the level of environmental degradation in the country, as well as promote long-term sustainable development as to allow for reforestation and environmental recuperation, development agencies must, "be part of an integrated approach, directly linking natural resource management with other pertinent

sectors such as early warning, urban planning, reproductive health, and job creation programs" (Smucker, v).

4. Evaluation of Environmental Impact Potential of Activities (Table 2):

Erosion and ecosystem damage at construction material borrow pits:
Improper sand extraction (e.g. from riverbeds or hillsides) can cause erosion, sedimentation of water bodies such as rivers, and destabilization of river beds and banks.

Upstream and downstream flooding and riverbank erosion:
Poor design of riverbank protection structures without considering river hydrology may have detrimental upstream and downstream effects.

Degradation of stone work, gabions, and other riverbank reinforcement structures:
Damage may occur to reinforcement structures, caused by river flow or intentional dismantling of gabions to remove rock for other purposes.

Clogging of drainage canals with sediment and trash:
Without periodic cleaning and maintenance, drainage canals fail to perform their function.

Skin problems and water-borne illness:
Use of drainage canal water for washing and other purposes may lead to skin infections and gastrointestinal disease.

5. Environmental Mitigation Actions (Tables 2 & 3) (this section is part of the annual EMR, but not the initial):

CHF will implement the following strategies to mitigate the potential impacts described above:

- Conduct river hydrology studies and incorporate findings into design of riverbank reinforcement and flood control structures;
- Re-vegetate riverbanks to stabilize soils and prevent erosion;
- Establish maintenance committees to perform periodic maintenance and cleaning of drainage canals;
- Raise awareness about detrimental effects of using drainage canal water and throwing trash into canals.
- Carry out Environmental Assessments for any flood control projects which will potentially alter the course of rivers, or that are to be located in sensitive areas.
- Monitor flood control and drainage projects during construction and after completion, and make adjustments to the mitigation plan when unforeseen impacts arise or when mitigation measures are insufficient to reduce impacts.

Tables 2 and 3 provide additional detail on the mitigation measures and monitoring strategy to be implemented by CHF Haiti.

III-A. Environmental Screening Form (Table 1):
*A screening form will be filled out for each individual project that falls under this UEMPR

III-B. Identification of Mitigation Plan (Table 2)

Activity/Impact/Mitigation Table (USAID/KATA) - Flood Control and Drainage			
Project Type	**Activity**	**Description of Impact**	**Prescribed mitigation measures**
A. Riverbank reinforcement/filling **See Sub-project type table for specific activities/impacts/ mitigations for gabion construction and riverbank re-vegetation activities*	i. Site identification and design of riverbank work	1. Riverbank protection can cause sedimentation and potential flooding problems downstream	a. Every effort should be made to understand the likely downstream consequences of riverbank reinforcement/filling projects. Depending on the severity of downstream impacts, consideration of project activity revisions may be necessary
			b. Ensure adequate hydrological analysis occurs to decide whether working on identified site achieves maximum beneficial results for communities located both at the site and downstream
		2. Riverbank reinforcement height or length is insufficient to handle high-volume events, resulting in flooding	a. Ideally, choose sites that have an easily accessible natural flood plain onto which flood waters can run without causing significant damage to homes or other important facilities
	ii. Sourcing of construction materials	3. Construction material extraction may contribute to deforestation, erosion, siltation or river eco-systemic damage.	a. Use available local materials first, but only if they provide long lasting, suitable materials for riverbank reinforcement structure. Local borrowed material can be very cost effective
			b. Limit extraction of rock from riverbed, and prohibit extraction of material from riverbanks and slopes
			c. Limit earth moving to dry seasons

			d. Backfill borrow pits when no longer needed, to prevent accumulation of standing water, use for waste disposal, etc.
	iii. Excavation for placement riverbank reinforcement structures (if applicable)	4. Erosion and sedimentation	a. Limit earth moving to dry seasons
			b. Dispose of construction waste at controlled sites with provisions for groundwater and surface water protection
			c. Minimize use of heavy machinery
		5. Construction site potentially poses a human health and safety hazard to workers and local residents	a. Designate a material storage zone that does not cause an obstruction to traffic and access to homes
			b. Place fencing around excavation site
			c. Provide potable water, adequate tools and protective gear, appropriate sanitary and solid waste disposal facilities for construction workers during excavation phase
	iv. Riverbank reinforcement structure construction, fill and decommissioning	6. Erosion and sedimentation	a. Limit earth moving/construction to dry seasons
			b. Minimize use of heavy machinery
			c. Dispose of construction waste at controlled sites with provisions for groundwater and surface water protection
		7. Construction during the wrong time period may deplete fish populations	a. Limit construction periods outside of fish reproduction and egg laying cycles
		8. Construction site potentially poses a human health and safety hazard to workers and local residents	a. Remove or bury all abandoned construction materials and rubble
			b. Fill in and close any latrines and septic systems that were built to service construction workers
			c. Provide potable water, adequate protective gear, appropriate sanitary and solid waste disposal facilities for use by construction workers

	v. Training on maintenance of riverbank filling or reinforcement structures	9. Damage and degradation of reinforcement structures	a. Local maintenance community groups should be established to monitor and repair any damages done to riverbank fill or reinforcement structures.
		10. Precautionary overflow area (closest natural flood plain to the river) may be a target for settlement in the future	a. Work with municipality to prevent the utilization of flood-prone land and install signage educating public about risks
B. Rehabilitation/ construction of drainage canals	i. Design of drainage canal and outlets	11. Unreinforced drainage canals and outlets can lead to erosion and/or gully formation	a. Reinforce drainage canals with vegetation, stone or cement
			b. Construct drainage outlets such as culvert pipes or rolling dip cross-drains. Reinforce area at outlet with rock or masonry splash apron to dissipate energy, or construct drains in areas of bedrock or dense vegetation
			c. Protect cross drains with rock, brush or logging to dissipate energy and prevent erosion.
		12. Joint areas placed at sharp angles or built with weak materials can lead to breakdown	a. Ensure that joint angles flow smoothly into existing drainage canals, not at a 90 degree angle
			b. Reinforce joints with stone masonry, extra cement or other suitable, durable materials
	ii. Cleaning and disposal of any drainage canal debris	13. Solid waste generation	a. Dispose of construction waste at controlled sites with provisions for groundwater and surface water protection. Do not pile drainage canal debris next to canals.
	iii. Sourcing of construction materials for drainage canal	14. Erosion and sedimentation	a. Use available local materials first, but only if they provide long lasting, suitable materials for riverbank reinforcement structure. Local borrowed material can be very cost effective
			b. Limit extraction of rock from riverbed, and prohibit extraction of material from riverbanks and slopes

			c. Limit earth moving to dry seasons
			d. Backfill borrow pits when no longer needed, to prevent accumulation of standing water, use for waste disposal, etc.
	iv. Excavation of canal and cross drainage	15. Soil erosion and sedimentation	a. Limit earth moving to dry seasons
			b. Remove all construction waste from site after project completion and dispose of properly
			c. Minimize use of heavy machinery to prevent erosion, noise, and air pollution
		16. Human health and safety hazard for workers and local residents	a. Designate a material storage zone that does not cause an obstruction to traffic and access to homes
			b. Place fencing around excavation site
			c. Minimize usage of heavy machinery to prevent erosion, noise pollution, air pollution and attenuate the environmental impact of construction
			d. Provide potable water, adequate tools and protective gear, appropriate sanitary and solid waste disposal facilities for construction workers during excavation phase
	v. Rehabilitation activities of drainage canal including reinforcement of walls and outlets	17. Sedimentation of drainage canals due to insufficient reinforcement of canal walls and outlets	a. Add outlet protection and or energy dissipaters in cross drains and culverts
		18. Erosion and/or sedimentation due to construction activities	a. Design a construction waste management plan for efficient and environmental friendly removal of waste
			b. Designate a material storage zone that does not cause an obstruction to traffic and access to homes
			c. Minimize use of heavy machinery
			d. Limit earth moving to dry seasons

		19. Construction site potentially poses a human health and safety hazard to workers and local residents	a. Provide potable water, adequate protective gear, appropriate sanitary and solid waste disposal facilities for the use of construction workers
	vii. Training on maintenance of drainage canal	20. Improper use of drainage water (bathing, washing clothes, animal use) may lead to health problems	a. As a supplement to trainings on best-practice use of drainage canals, print and laminate posters about possible effects of using drainage water for washing and throwing trash into canals and hang them in visible, highly trafficked areas
		21. Disposal of waste along the edges of the canal can hinder water flow and drainage into the canals, increasing the probability of flooding	a. Regular monitoring of the condition of structures b. Design a maintenance plan to ensure the cleaning of mud/waste from canals to make sure that the water can be drained efficiently
		22. Disposal of waste/mud in canal may obstruct the course of the water, impeding the drainage during rainfalls and increasing the probability of flooding of influence zone	a. Clean drainage canals, culverts and other drainage structures before finishing project

Activity/Impact/Mitigation Sub-Project Type Table (USAID/KATA) - Flood Control and Drainage

Sub-Project Type	Activity	Description of Impact	Prescribed mitigation measures
I. Gabion construction	i. Design of gabions as riverbank reinforcement structures	23. Erosion of riverbanks and/or sedimentation	a. Ensure that soils on the riverbank are adequately stabilized by reforesting and re-vegetating (with vetiver, elephant grass, fruit-bearing trees, or jatropha)

	ii. Construction of gabions along riverbank	24. Deterioration of gabions and/or riverbank due to inadequate fill around gabions	a. Backfill around gabions and reinforce area through reforestation and revegetation after gabion completion.
II. Riverbank re-vegetation	ii. Planting of selected vegetation	25. Without proper planning and planting techniques, planted vegetation will not thrive	a. Build fencing, either plastic or metal around seedlings to prevent animals from grazing on the seedlings
			b. Train community members on the advantages of applying compost to improve organic matter content, texture of the soil, and the soil's ability to infiltrate rainfall
	iii. Training and maintenance of seedlings	26. Failure of vegetation to establish root systems and prevent erosion	a. Establish a local community group responsible for providing adequate care for seedlings and vegetation

III-C. Environmental Monitoring and Evaluation Tracking Table (Table 3).

Environmental Monitoring and Evaluation Report (USAID/KATA) - Flood Control and Drainage									
			Monitoring Methods			Results			
Impact No.	Description of Mitigation Measure	Responsible Party	Indicators	Methods	Frequency	Dates Monitored	Problems Encountered	Mitigation Effectiveness	Recommended Adjustments
A. Riverbank reinforcement/filling									
1	a. Every effort should be made to understand the likely downstream consequences of riverbank reinforcement/filling projects. Depending on the severity of downstream impacts, consideration of project activity revisions may be necessary		Y/N hydrological study implemented before or simultaneously to project design phase	Study report	Once at project implementation				

	b. Ensure adequate hydrological analysis occurs to decide whether working on identified site achieves maximum beneficial results for communities located both at the site and downstream								
2	a. Ideally, choose sites that have an easily accessible natural flood plain onto which flood waters can run without causing significant damage to homes or other important facilities								
3	a. Use available local materials first, but only if they provide long lasting, suitable materials for riverbank reinforcement structure. Local borrowed material can be very cost effective		Y/N signs of erosion around construction and/or borrow pit sites	Field Visit Report	Weekly during construction and every 3 months for 1 year after construction				
	b. Limit extraction of rock from riverbed, and prohibit extraction of material from riverbanks and slopes								
	c. Limit earth moving to dry seasons								

	d. Backfill borrow pits when no longer needed, to prevent accumulation of standing water, use for waste disposal, etc.								
4	a. Limit earth moving to dry seasons								
	b. Dispose of construction waste at controlled sites with provisions for groundwater and surface water protection								
	c. Minimize use of heavy machinery								
5	a. Designate a material storage zone that does not cause an obstruction to traffic and access to homes		Y/N Reported accidents or complaints from community related to construction site	Informal survey of workers, construction supervisors and community residents	Weekly during construction phase				
	b. Place fencing around excavation site								
	c. Provide potable water, adequate tools and protective gear, appropriate sanitary and solid waste disposal facilities for construction workers during excavation phase								
6	a. Limit earth moving/construction to dry seasons		Y/N signs of erosion around construction	Field Visit Report	Weekly during construction and every 3				

	b. Minimize use of heavy machinery		and/or borrow pit sites		months for 1 year after construction				
	c. Dispose of construction waste at controlled sites with provisions for groundwater and surface water protection		Y/N construction site cleanup completed	Field Visit Report	Once at completion of construction				
7	a. Limit construction periods outside of fish reproduction and egg laying cycles		Y/N construction activities during fish reproduction and egg laying cycles	Field Visit Report	Once prior to project implementation				
8	a. Remove or bury all abandoned construction materials and rubble		Y/N construction site cleanup completed	Field Visit Report	Once at completion of construction				
	b. Fill in and close any latrines and septic systems that were built to service construction workers								
	c. Provide potable water, adequate protective gear, appropriate sanitary and solid waste disposal facilities for use by construction workers		Y/N Reported accidents or complaints from workers/ supervisors	Informal survey of workers and construction supervisors	Weekly during construction phase				

9	a. Local maintenance community groups should be established to monitor and repair any damages done to riverbank fill or reinforcement structures.		Y/N visible damages to riverbank refill or reinforcement structures	Field Visit Report	Quarterly				
10	a. Work with municipality to prevent the utilization of flood-prone land and install signage educating public about risks		Y/N existence of a public awareness campaign/ signage	Field Visit Report	Once at project completion				
B. Rehabilitation of drainage canals									
11	a. Reinforce drainage canals with vegetation, stone or cement		Number of trees planted/ number of trees surviving	Field Visit Report	Quarterly				
	b. Construct drainage outlets such as culvert pipes or rolling dip cross-drains. Reinforce area at outlet with rock or masonry splash apron to dissipate energy, or construct drains in areas of bedrock or dense vegetation		Y/N Drainage canals and outlets show signs of degradation or erosion	Visual inspection	Semi-annually after completion of project				

	c. Protect cross drains with rock, brush or logging to dissipate energy and prevent erosion.								
12	a. Insure that joint angles flow smoothly into existing drainage canals, not at a 90 degree angle								
	b. Reinforce joints with stone masonry, extra cement or other suitable, durable materials								
13	a. Dispose of construction waste at controlled sites with provisions for groundwater and surface water protection. Do not pile drainage canal debris next to canals.		Y/N signs of erosion around construction and/or borrow pit sites	Field Visit Report	Weekly during construction and every 3 months for 1 year after construction				
14	a. Use available local materials first, but only if they provide long lasting, suitable materials for riverbank reinforcement structure. Local borrowed material can be very cost effective								
	b. Limit extraction of rock from riverbed, and prohibit extraction of material from riverbanks and								

	slopes								
	c. Limit earth moving to dry seasons								
	d. Backfill borrow pits when no longer needed, to prevent accumulation of standing water, use for waste disposal, etc.								
15	a. Limit earth moving to dry seasons								
	b. Remove all construction waste from site after project completion and dispose of properly								
	c. Minimize use of heavy machinery to prevent erosion, noise, and air pollution								
16	a. Designate a material storage zone that does not cause an obstruction to traffic and access to homes								
	b. Place fencing around excavation site		Y/N Reported accidents or complaints	Informal survey of workers,	Weekly during construction phase				

	c. Minimize usage of heavy machinery to prevent erosion, noise pollution, air pollution and attenuate the environmental impact of construction		from workers or community related to construction site	construction supervisors and community residents					
	d. Provide potable water, adequate tools and protective gear, appropriate sanitary and solid waste disposal facilities for construction workers during excavation phase								
17	a. Add outlet protection and or energy dissipaters in cross drains and culverts		Y/N drainage outlets show signs of erosion	Visual inspection	Semi-annually after completion of project				
18	a. Design a construction waste management plan for efficient and environmental friendly removal of waste		Y/N Construction waste present at site	Field Visit Report	Once at completion of construction				
	b. Designate a material storage zone that does not cause an obstruction to traffic and access to homes								
	c. Minimize use of heavy machinery		Y/N signs of erosion around	Field Visit Report	Weekly during construction				

	d. Limit earth moving to dry seasons		construction and/or borrow pit sites		and every 3 months for 1 year after construction				
19	a. Provide potable water, adequate protective gear, appropriate sanitary and solid waste disposal facilities for the use of construction workers		Y/N Reported accidents or complaints from community related to construction site	Informal survey of workers, construction supervisors and community residents	Weekly during construction phase				
20	a. As a supplement to trainings on best-practice use of drainage canals, print and laminate posters about possible effects of using drainage water for washing and throwing trash into canals and hang them in visible, highly trafficked areas		Y/N Local residents observed throwing trash into canals or using drainage water for bathing	Community Survey	Semi-annually after completion of project				
21	a. Regular monitoring of the condition of structures		Y/N Presence of sediment or trash in drainage canals that impedes water flow	Visual inspection	Semi-annually after completion of project				
	b. Design a maintenance plan to ensure the cleaning of mud/waste from canals to make sure that the water can be drained efficiently								

22	a. Clean drainage canals, culverts and other drainage structures before finishing project								
Environmental Monitoring and Evaluation Report (USAID/KATA) - Sub-Project Type Flood Control and Drainage									
I. Gabion construction									
23	a. Ensure that soils on the riverbank are adequately stabilized by reforesting and re-vegetating (with vetiver, elephant grass, fruit-bearing trees, or jatropha)		Number of seedlings planted/number of seedlings surviving	Field Visit Report	Semi-annually after completion of project				
24	a. Backfill around gabions and reinforce area through reforestation and re-vegetation after gabion completion.		Y/N signs of erosion around construction and/or borrow pit sites	Field Visit Report	Weekly during construction and every 3 months for 1 year after construction				
II. Riverbank re-vegetation									
25	a. Build fencing, either plastic or metal around seedlings to prevent animals from grazing over the seedlings		Number of seedlings planted/number of seedlings surviving	Field Visit Report	Semi-annually after completion of project				

	b. Train community members on the advantages of applying compost to improve organic matter content, texture of the soil, and the soil's ability to infiltrate rainfall								
26	a. Establish a local community group responsible for providing adequate care for seedlings and vegetation		Existence of a community maintenance agreement and responsible party	Field Visit Report	Once at project Implementation				

References for UEMPR tables:

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