ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

LABOR INTENSIVE PUBLIC WORK PROJECT – ADDITIONAL FINANCING (LIPWP-AF)

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1. INTR ODUCTION

1.1. PROJECT BACKGROUND

In 1995, the government of Yemen initiated a structural reform program to stabilize the economy and stimulate sustainable growth. To mitigate adverse effects of implementing this program on the most vulnerable population, a social safety net was established with the main objective of poverty alleviation through various mechanisms targeting the most vulnerable groups. The public works project (PWP) was established in 1996, as one of the main components of the social safety net. The second Public Works Project (PWP-2) was the extension of the first project, followed by (PWP-3) as the third phase and the Labor Intensive Public Works Project (PWP-IV) as the fourth extension of this project. Now the Additional Financing phase of LIPWP-AF is being proposed with similar but more sharpened development objectives and indicators, as well as design considerations to better address any possible environmental and social impacts based on the lessons learned.

1.2. PROJECT DESCRIPTION

The LIPWP-AF will continue to support sub-projects, where 656 additional subprojects are being proposed, in extensions to health centers, water catchment reservoirs, water supply and sewerage collection and treatment facilities, extensions to schools, and pavement and drainage of existing roads. The demand for these sub-projects comes from the target communities. Sub-projects are identified at the community or local government level in co-operation with NGOs, concerned sector ministries, the Governor's office and the PWP-PMU. Sub-project selection targets deprived areas with high poverty rates, thus, almost eighty percent of sub-projects are implemented in rural areas. Subproject selection criteria include: (i) design criteria that include choice of construction technology; (ii) appropriate technical standards/specifications; (iii) affordable O&M; (iv) effective demand elicited through beneficiary consultations, (v) community contributions in cash or kind; and (vi) a labor content of at least 30%. It should be noted that sub-projects selection criteria exclude those subprojects that: (i) would require involuntary resettlement of people in accordance with World Bank safeguard policy OP 4.12; and (ii) any sub-project that involves transboundary aquifers or other international waterways in accordance with World Bank safeguard policy OP/BP 7.50.

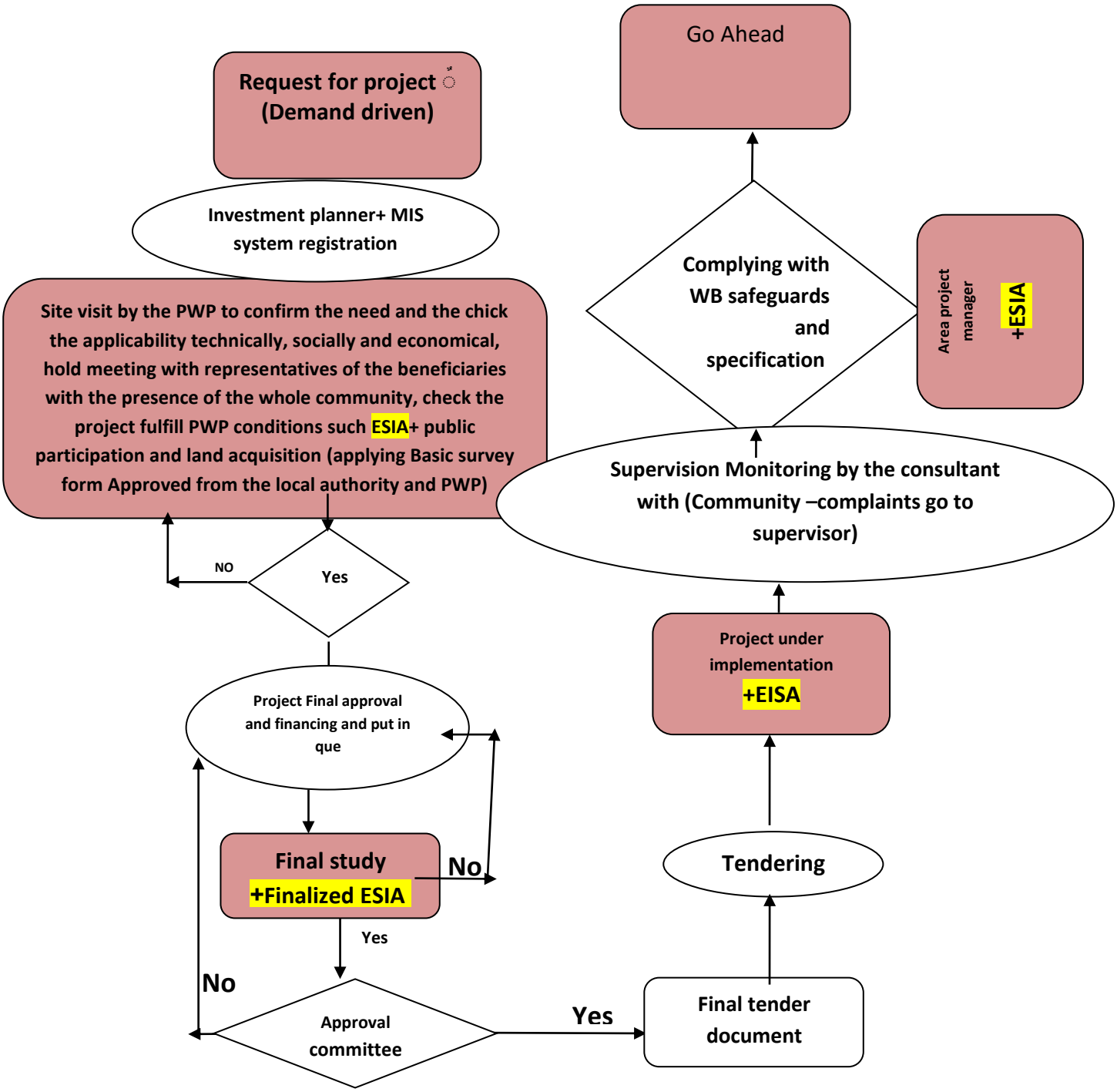
LIPWP-AF will continue to be executed under the supervision of a Steering Committee (SC) by the Project Management Unit (PMU). The SC is composed of six representatives from the government and three from non-government organizations, and chaired by the Minister of Planning and International Cooperation. The PMU Director acts as the secretary of the SC.

1.3. PROJECT LOCATION

The additional sub-projects are to be located in all Governorates. The PMU is located in Sana'a and it has nine regional offices in key Governorates. The regional office in Sana'a is serving Sana'a trustee, Sana'a governorate, and Al-Mahweet. The office in Aden covers the Governorates of Aden, Lahj, Abyan and Ad Dhala'. The Taiz regional office is responsible for the sub-projects in Taiz, and Ibb governorates. The Hadramawt regional office is responsible for sub-projects in Hadramawt and Al Mahrah governorates, The Hajja regional office is responsible for Sa'da and Hajja governorates, The Shabwa regional office is responsible for sub-projects in Marib and Shabwa governorates, The Amran regional office serves the governorates Al Jauf and Amran, The Thamar regional office serves Thamar and

Al-Baidha'a governorates, and the Hodiedah regional office serves Hodiedah and Raimah governorates.

1.4. PROJECT CYCLE AT PWP:



1.5. INTRODUCTION TO AND OBJECTIVES OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

This document presents an Environmental and Social Management Framework (ESMF) for the proposed LIPWP-AF. The objective of this ESMF is to provide (i) an environmental and social management process for the design and implementation of the LIPWP-AF and (ii) a practical tool during project formulation, design, planning implementation and monitoring to ensure that environment and social aspects are duly considered in the planning an implementation process. The ESMF describes the steps involved in identifying and mitigating the potential environmental and social impacts of proposed investments and ensures that all relevant institutional capacity building and trainings needs are established for effective implementation of recommendations outlined in the ESMF.

The ESMF details agreed policies, guidelines and procedures to be integrated into project implementation and assists with achieving compliance with applicable Yemeni laws and regulations as well as relevant World Bank policies for environment and social development safeguard policies and triggers. At present, the details of the subprojects of the components are not yet in place. Therefore, ESMF is the appropriate safeguard instrument to be prepared prior to project appraisal. The ESMF entails an Environmental and Social Screening process which allows subprojects to be classified according to their potential impacts and appropriate mitigation/rehabilitation measures required. The ESMF summarizes institutional arrangements for the implementation of mitigation measures, the monitoring arrangements, including monitoring indicators, capacity building needs as well as cost estimates.

1.6. THE ESMF

The ESMF is presented in three main parts, namely, the environmental and social impact (chapter 2), the mitigation program (chapter 3), and the monitoring plan (chapter 4). Each of these chapters is presented by sector as the nature of the impacts and mitigation measures vary according to the type of proposed works. The impacts and mitigation measures are also presented by stages of sub-project implementation such as design, construction and operation upon completion and commissioning. The ESMF also takes into account the experience and lessons learned from the previous phases of the PWP program (PWP1-3). The cost of implementing the mitigation measures would be included in the contracts as such measures would be part of the design. The cost of monitoring compliance with the ESMF would be included in the cost of the consultant contracts for design and construction supervision. An independent environmental consultant will be retained by the PMU for following up on specific environmental issues encountered during implementation and for independent reporting by the PMU to the SC and the Bank.

1.7. THE SUB-PROJECT SCREENING PROCESS

The ESMF entails an Environmental and Social Screening process which allows subprojects to be classified according to their potential impacts and appropriate mitigation/rehabilitation measures. The initial safeguards screening form for all proposed civil works for subproject-level activities is catered to assess the application of the Bank Operational Safeguard Policies on physical cultural resources, and involuntary land acquisition and resettlement. While the Project is expected to only operate on public/state lands, the screening will assist in risk management, especially related to the presence of squatter or other encumbrances on state lands. The screening form also caters for “chance finds” relating to the Physical and Cultural

Resources Policy of the Bank. If there are “chance finds” which relate to Physical and Cultural Resources, please apply Appendix A. The initial screening form will not screen for the possible application of OP 4.04 Natural Habitats, OP 4.10 Indigenous Peoples, OP 4.36 Forests, OP 4.37 Safety of Dams, OP 7.50 Projects on International Waterways, or OP 7.60 Projects in Disputed Areas

1.8. THE SUB-PROJECT INTERVENTION

According to the me Concept Memorandum for a proposed Additional Financing to the Labor Intensive Public Works Project (P148366), The type of projects are listed as follows (Table 1.1):

Table (1.1.) List of subprojects for intervention

No.	sub-project sector
1	Health units
2	water harvesting schemes
3	water supply schemes
4	Sanitation schemes
5	Schools
6	stone paving
7	social buildings

2. ENVIRONMENTAL AND SOCIAL IMPACTS

2.1. INTRODUCTION

The LIPWP-AF sub-projects can be implemented in any part of Yemen. This section therefore, addresses general environmental impacts per category of sub-projects. At the end of each category, the general environmental impacts for each sub-project type, including the perceived risk of each impact, are listed in a summary table. Permanent impacts are expected to result from actions at the design and operation phases, while temporary impacts will result from actions at the construction phase.

The end of the section contains a small summary of lessons learnt from previous PWP experience.

2.2. PROJECT IMPACTS

2.2.1. HEALTH SUB-PROJECTS

The sub-projects in this sector are expected to have high positive health impacts on the communities they are going to serve. They will provide the communities with essential health services, which are highly needed especially in remote, difficult to reach and deprived areas.

The main negative impact that can occur in this sector is the generation of medical waste that should be safely disposed off. This will have to be organized together with the ordinary solid waste disposal. It is important to mention that the safe disposal of medical waste is a pending issue in Yemen that still awaits to be strictly addressed by the relevant ministries. During the subproject construction phase, increased levels of noise and vibration might occur and there is a higher possibility of accidents for the implementation of health units or centers, a general mitigation measure that has been implemented during the previous phase (PWP-4) is the use of well designed incinerators which was recommended by a summary report of PWP-3recommendation.

In the Bank supervision mission during PWP-3, in which a senior environmental specialist from the Bank participated, the issue of the incinerator assessment was discussed and reported the following: Previous efforts to identify a local/ regional consultant did not pan out, due to the lack of respective expertise in the region. However, the issue was discussed prior to, and during, the mission at the context of the health sector as a whole in the entire country, and the following concerns were raised by the PMU. Firstly, the question on whether the impact of the (possibly inadequate) incinerating of health care waste would have any impact where the health care facility is constructed in a remote rural area. Secondly, the performance and suitability of the already constructed incinerators, if they were deemed inadequate, were to be investigated by the consultant retained for that purpose. Thirdly, whether the Ministry of Health, the beneficiary of a number of donor-funded projects, which is responsible for the construction of health care facilities at a larger scale than those constructed through the Public Works Projects, should take the lead in any specific requirement for healthcare waste incineration.

It became, therefore, evident that a country-wide dialogue is necessary, and timely, to identify means of addressing the issue of health care waste, to ensure consistency in addressing this issue, both within and outside the scope of the PWP. Task teams of PWP and Health Sector projects in Yemen have started a dialogue for cooperation to address this issue under IDA-funded projects..

The incinerators have been built of local materials and located within the boundaries of the health facility, taking into account the orientation of prevailing winds and the location of surrounding houses. Also health units were provided with built-in masonry workbenches finished with tiles to provide an easy-to-clean work surface for the staff. Likewise the unit could be provided with concrete or masonry furniture, including built-in shelves, sideboards or closets as heavy-duty furniture, which cannot easily be damaged or removed. Moreover, the X-ray rooms, where they exists, were coated with lead at layer thickness of 2-3mm in order to control migration of radiation outside the room for the protection of health workers and visitors. The liquid medical waste, considered contaminated and a health hazard, was also collected separately away from the cesspit into an open chamber allowing for evaporation.

See Appendix B-1 for an Environmental and Social Impact Assessment (ESIA) Screening Checklist specific to Health sub-projects.

Potential Impact Area: Health	Impact identification method						Impact Analysis method				Design Phase	Construction Phase	Operation Phas
	Checklist	Matrices	Networks	overlays & GIS	Professional Experience.	Other	professional judgment	physical models experimentation	case studies & qualitative comparisons	other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
BIOLOGICAL													
Flora and fauna					√					√	-	-	0
Endangered species					√					√	0	0	0
Sensitive habitats					√					√	0	0	0
Species of commercial importance					√					√	0	0	0
COMMUNITY													
Population	More possibl	√								√		0	- - -
Structure					√					√	0	0	0
Employment and Labor market	√									√	0	+	+
Distribution of income, goods and Services					√					√	0	+	+
Customs, aspirations and attitudes					√					√	0	+	++
Resettlement	√									√	0	0	0
EDUCATION													
More possibility of accidents	√								√		0	- -	- -
Women adult education					√				√		0	0	+++
Health awareness	√								√		0	0	+++
HEALTH													
The availability of health services	√								√		0	0	+++
Unhygienic toilet (latrine)	√								√		0	0	- -
Collection, handling and disposal of medical waste	√						√				0	0	- -
LAND RESOURCES													
Topography, soils, floods, Earthquakes					√		√				-	-	0
Soil contamination					√		√				-	-	-
LAND USE													
Disputes over the use of the building site					√		√				- -	0	0
Other Social impacts													
Gender					√							++	++
Community participation					√							++	++
AMBIENT AIR													
Increased levels of noise,					√		√				0	- -	0
SAFETY													
More possibility of accidents	√								√		0	- -	- -

2.2.2. WATER HARVESTING RESERVOIRS SUB-PROJECTS

No negative environmental impacts are anticipated in water harvesting sub-projects, as the size of the catchment area under these type of sub-projects is small in relation to the entire watershed area, and such small rainwater collection facilities would not encroach into the riparian rights of downstream water users. These types of projects are also designed in ways to control flood damage as it include provisions in the design of hydraulic structures for steady-state flows. The main impacts of this kind of sub-projects will be positive. The provision of water for agricultural, domestic or drinking purposes has high positive impacts on the general livelihood conditions of the communities especially of women and children, since they are mainly responsible for the fetching of water. The positive social impacts can be observed in the increased numbers of enrolment at schools, especially in the case of girls, and in the women's enrolment in literacy classes and other social or income generating activities.

The likely negative impacts would be in the lack of the community participation and contribution, improper use that would result in spillage at public collection points, pooling of wasted water that would promote vector breeding and the generation of increased quantities of wastewater in the absence of community environmental sanitation facilities. It is important to mention that the low coverage of environmental sanitation facilities, especially in rural areas, is a national problem in Yemen. Other small scale potential negative impacts include the increased dust generated during excavation and preparation of drainage beds and reservoirs. Also during construction the levels of noise and vibration will increase and there is a risk of damage to water supply pipes, paved roads, underground electricity cables, existing cesspits, and similar underground infrastructure. Also, the risk of accidents will rise.

Another aspect of design that might lead to a negative impact could be the selection of the site for the reservoir and catchment area. If the proposed site is in a densely populated area, the people are tempted to throw their garbage in the feeder channels and wastewater could spill into the reservoir, thus contaminating the water. This is a very unwanted development. Therefore, it is advised to locate the reservoirs away from populated areas, and if this cannot be avoided, awareness raising programs should highlight the dangers of these actions. In the worst case, the population should be advised not to drink the water and only use it for domestic use, like washing, laundry and watering crops not eaten raw.

Generally, the objective of the rain water harvesting could well be for the irrigation, drinking-household and/or groundwater recharge. For the case of drinking- household purpose, the PWP-4 has implemented a well-designed and approved sand filter system, and water for drinking is boiled and cooled before use. The communities were trained on operation and maintenance of such mitigation measures. Additionally, a water sharing issue was addressed by suggesting a distribution timetable of water to the beneficiaries under supervision by the elected committee from beneficiaries and local council.

See Appendix B-2 for an Environmental and social Impact Assessment (ESIA) Screening Checklist specific to Water Catchment sub-projects.

Potential Impact Area: Water Harvesting Reservoir	Impact identification method						Impact Analysis Method				Design Phase	Construction Phase	Operation Phase
	checklist	Matrices	Networks	overlays & GIS	Professional Experience.	Other	professional judgement	physical models experimentation	case studies & qualitative comparisons	other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
BIOLOGICAL													
Flora and fauna					√					√	-	-	-
Endangered species					√					√	0	0	0
Sensitive habitats					√					√	0	0	0
Species of commercial importance					√					√	0	0	0
COMMUNITY													
Population					√					√	0	0	+
Employment and Labor market	√									√	0	+++	+
Distribution of income, goods and Services					√					√	0	+	+
Customs, aspirations and attitudes					√					√	0	0	++
Resettlement	√									√	0	0	+
HEALTH													
The formation of vector breeding Sites					√				√		0	0	- -
Dumping of solid waste or waste water in feeder canals or catchment area					√				√		0	0	- - -
Health problems due to insufficient treatment or accidental consumption					√				√		0	0	- -
LAND RESOURCES													
Topography, soils, floods, earthquakes					√		√				0	0	+
LAND USE													
Disputes over the use of land for the building site					√		√				- -	0	0
Other Social impacts													
Gender					√							+	++
Community participation					√							+	++
AMBIENT AIR													
Increased levels of noise, vibration and dust					√		√				0	- - -	0
SAFETY													
More possibility of accidents	√								√		0	- - -	- -
Possible adverse impacts on soil conditions as a result of storage					√					√	0	0	-
WATER & WATER SUPPLY													
Groundwater	√						√				0	0	+
Pollution of water sources	√								√		0	0	++

2.2.3. WATER SUPPLY SUB PROJECTS

The completion of water supply has strong positive health and environmental impacts. These sub-projects are generally of small-size for which no major negative environmental impacts are anticipated, and minor negative impacts should be readily addressed through proper design, construction and operation and maintenance. Water supply sub-projects consist of improvements to rural water distribution system.

The main negative impact of the water supply sub-projects would be the generation of increased quantities of wastewater in the absence of environmental sanitation facilities, which is a national problem in Yemen especially in rural areas. During excavation and burial of pipes, increased dust might arise as will be the noise and vibration levels. Beside the increase of accidents, damage to existing water supply pipes, paved roads, underground electricity cables, existing cesspits, and similar underground infrastructure. Therefore, mitigation measures will be necessary for the design, construction and operation and maintenance of such facilities.

In many of these sub-projects, protection around the water source is needed. The existing well and the pump engines should be enclosed in pump houses for protection and safety reasons. In the operation and maintenance manual for the new works, LIPWP engineers should include provisions for the pump operators to collect the used oil in barrels, instead of spilling it on the ground, polluting the well and adjacent properties. The changed oil could be sold as fuel for use in public traditional baths or in many other ways like applying it as a protective coat to wood or during asphalting roads. During the previous years, some private sector companies were involved in the collection, refining and reuse of spent oil.

During the PWP-3, one of the conditions is to postpone the asphalt pavement works until the water supply network is implemented. This measure and procedure will continue to be applied in the LIPWP-AF for the similar sub-projects.

See Appendix B-3 for an Environmental and Social Impact Assessment (ESIA) Screening Checklist specific to Rural Water Supply sub-projects

Potential Impact Area: Water Supply	Impact identification method						Impact Analysis method				Design Phase	Construction Phase	Operation Phase
	checklist	Matrices	Networks	overlays & GIS	Professional Experience.	Other	professional judgment	physical models experimentation	case studies & qualitative comparisons	other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
Increased dust during excavation and burial of pipes and at the water treatment works site.	√						√				0	- - -	0
BIOLOGICAL													
Flora and fauna					√					√	-	-	0
Endangered species					√					√	0	0	0
Sensitive habitats					√					√	0	0	0
Species of commercial importance					√					√	0	0	0
COMMUNITY													
Population					√					√	0	0	+
Structure					√					√	0	0	+
Employment and Labor market	√									√	0	+++	++
Distribution of income, goods and Services					√					√	0	+	+
Customs, aspirations and attitudes					√					√	0	0	++
EDUCATION													
Enrolment of children					√				√		0	0	+++
Women adult education					√				√		0	0	+++
Health awareness	√								√		0	0	+++
HEALTH													
The formation of vector breeding sites effluent ponds.					√				√		0	0	- -

Potential Impact Area: Water Supply (continued)	Impact identification method						Impact Analysis Method				Design Phase	Construction Phase	Operation Phase
	checklist	Matrices	Networks	overlays & GIS	Professional Experience.	Other	professional judgement	physical models experimentation	case studies & qualitative comparisons	Other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
INFRASTRUCTURE SERVICES													
Possible destruction of paved roads, cables, existing cesspits etc.	√								√		0	---	0
LAND RESOURCES													
					√		√				0	0	-
LAND USE													
					√		√				-	0	--
Other Social impacts													
Gender					√							++	++
Community participation					√							++	++
AMBIENT AIR													
Increased levels of odors, dust, noise and vibration					√		√				0	---	--
SAFETY													
More possibility of accidents	√								√		0	---	--
TRAFFIC													
Disruptions	√								√		0	--	0
Local access	√								√		0	--	0
WATER													
Groundwater	√						√				0	0	+
Disposal of waste and resource use	√						√				0	0	++
Wastewater generation					√		√				0	0	-
Wastewater tariffs			√				√				0	0	+
Pollution of water sources	√								√		0	0	++

2.2.4. SANITATION SUB-PROJECTS

The completion of sewerage schemes has strong positive health and environmental impacts. These sub-projects are generally of small-size for which no major negative environmental impacts are anticipated, and minor negative impacts should be readily addressed through proper design, construction and operation and maintenance. Sanitation sub-projects consist of improvements to rural sanitary disposal systems.

During excavation and burial of pipes, increased dust might arise as will be the noise and vibration levels. Beside the increase of accidents, damage to existing water supply pipes, paved roads, underground electricity cables, existing cesspits, and similar underground infrastructure. Therefore, mitigation measures will be necessary for the design, construction and operation and maintenance of such facilities.

In the operation and maintenance manual for the new works, LIPWP engineers should include provisions for the pump operators to collect the used oil in barrels, instead of spilling it on the ground, increasing the pollution on the wastewater and the loading on the wastewater treatment facility as well as the groundwater and adjacent properties. The changed oil could be sold as fuel for use in public traditional baths or in many other ways like applying it as a protective coat to wood or during asphalting roads. During the previous years, some private sector companies were involved in the collection, refining and reuse of spent oil.

During the PWP-3, one of the conditions is to postpone the asphalt pavement works until the sewerage network is implemented. This measure and procedure will continue to be applied in the LIPWP-AF for the similar sub-projects.

For the design, construction and operation of wastewater systems in LIPWP, the measures for protection against groundwater infiltration and pollution from sewage discharges, has considered the most suitable treatment technology for reuse of treated wastewater. Moreover, the type of sewerage network, site selection for the treatment facility, the technology to be applied under the PWP-IV will continue to be applied under the LIPWP-AF.

See Appendix B-4 for an Environmental and Social Impact Assessment (ESIA) Screening Checklist specific to Rural Sanitation sub-projects.

Potential Impact Area: Sewerage sub-projects	Impact identification method						Impact Analysis method				Design Phase	Construction Phase	Operation Phase
	checklist	Matrices	Networks	overlays & GIS	Professional Experience.	Other	professional judgment	physical models experimentation	case studies & qualitative comparisons	other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
Increased dust during excavation and burial of pipes and at the treatment works site.	√						√				0	- - -	0
BIOLOGICAL													
Flora and fauna					√					√	-	-	0
Endangered species					√					√	0	0	0
Sensitive habitats					√					√	0	0	0
Species of commercial importance					√					√	0	0	0
COMMUNITY													
Population					√					√	0	0	+
Structure					√					√	0	0	+
Employment and Labor market	√									√	0	+++	++
Distribution of income, goods and Services					√					√	0	+	+
Customs, aspirations and attitudes					√					√	0	0	++
EDUCATION													
Enrolment of children					√				√		0	0	+++
Women adult education					√				√		0	0	+++
Health awareness	√								√		0	0	+++
HEALTH													
The formation of vector breeding sites effluent ponds.					√				√		0	0	- -
Possibility of suffocation or explosions due to negligence while opening the septic tanks for cleaning and the release of flammable gases					√				√		0	0	- - -
Wastewater disposal	√								√		0	0	- -
Health problems due to direct contact and handling of effluent.						√				√			0
Removal and disposal of waste materials from pits	√						√				0	- - -	0
Health problems due to insufficient treatment or improper effluent disposal from septic tanks to agricultural lands							√						√
Collection, handling and disposal of waste	√						√				0	- - -	- -

Potential Impact Area: Sanitation sub-projects (continued)	Impact identification method						Impact Analysis Method				Design Phase	Construction Phase	Operation Phase
	checklist	Matrices	Networks	overlays & GIS	Professional Experience.	Other	professional judgement	physical models experimentation	case studies & qualitative comparisons	Other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
INFRASTRUCTURE SERVICES													
Possible destruction of water supply pipes, paved roads, cables, existing cesspits etc.	√								√		0	---	0
LAND RESOURCES													
Soil contamination					√		√				0	0	-
LAND USE													
Disputes over the use of treated effluent for irrigation.					√		√				-	0	--
Other Social impacts													
Gender					√							++	++
Community participation					√							++	++
AMBIENT AIR													
Increased levels of odors, dust, noise and vibration					√		√				0	---	--
SAFETY													
More possibility of accidents	√								√		0	---	--
Possible adverse impacts on soil conditions as a result of lower treatment efficiency levels.					√					√	0	0	-
TRAFFIC													
Disruptions	√								√		0	--	0
Local access	√								√		0	--	0
WATER													
Groundwater	√						√				0	0	+
Disposal of waste and resource use	√						√				0	0	++
Wastewater generation					√		√				0	0	-
Wastewater tariffs			√				√				0	0	+
Designed locations of points of disposal of effluent, sludge drying beds or other sludge treatment causing pollution of water resources.	√								√		0	0	++
Insufficient treatment capacity for the designed treatment works.	√								√		0	0	--
Pollution of water sources	√								√		0	0	++

2.2.5. SCHOOL SUB-PROJECTS

Schools are designed to provide education services on the village or district levels and to promote education among male and female students, with special attention to encouraging the enrolment of girls in formal education. Sub-projects under the LIPWP-AF will be either extensions to existing schools or building of new ones.

The main potential adverse environmental and social impacts are expected to occur as a result of disputed land ownership, or by locating a school on a flood-prone area or adjacent to a paved main road with heavy traffic. Land ownership disputes should be settled as it is a screening criteria for approval of the sub-projects, and new schools should never be constructed near a flood prone area. If a school is to be positioned in a flood prone area, then all precautions should be taken during the design stage to ensure the safety of the structure and access to it, and of the students and school personnel while being in the school or while arriving or leaving the school. Increased dust levels during excavation and preparation of construction sites, as well as increased levels of noise and vibration and a higher possibility of accidents should be addressed through proper construction procedures and requirements specified in the contract documents.

During the implementation of PWP-3, septic tanks were applied for the needed cases where schools have no means of sanitation. The septic tanks were followed by cesspit, or in cases of rocky areas, with either perforated pipe or another collection chamber after the septic tank. The sludge is frequently evacuated and discharged from septic tank onto sludge drying beds and used as a bio fertilizer or soil conditioner by local farmers. The collected wastewater from the collection chamber is evacuated when the septic tank is full.

In cases when secondary schools have chemistry laboratories, the same solution applied under PWP-IV will be used under LIPWP-AF consisting of a small modified incinerator for the disposal of solid waste, as well as a small open evaporation chamber for the disposal of liquid chemical waste from the laboratories, as in the health subprojects for disposal of hazardous solid and liquid waste, the separation of the liquid hazardous waste at the laboratories is done manually by means of a small container to be transported by the workers to the evaporation chamber.

Rainwater harvesting from roofs was also considered with a collection tank and a small water pump. The rain water is used either for irrigation or flushing the toilets or even for washing with care.

See Appendix B-5 for an Environmental and Social Impact Assessment (ESIA) Screening Checklist specific to School sub-projects

Potential Impact Category: Schools	Impact identification method						Impact Analysis method				Design Phase	Construction Phase	Operation Phas
	checklist	Matrices	networks	overlays & GIS	Professional Experience.	Other	professionl judgement	physical models perimentation	case studies & qualitative comparisons	other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
LAND USE													
Disputes over the use of land for the building site					√		√				- -	0	0
Endangered species					√					√	0	0	0
Sensitive habitats					√					√	0	0	0
Species of commercial importance					√					√	0	0	0
Other Social impacts													
Gender					√							+	+
Community participation					√							+	+
COMMUNITY													
Population					√					√	0	0	+
Structure					√					√	0	0	+
Employment and Labor market	√									√	0	++	+
Distribution of income, goods and Services					√					√	0	+	+
Customs, aspirations and attitudes					√					√	0	0	+++
HEALTH													
Increased awareness levels	√						√				0	0	+++
Unhygienic toilet (latrine) Conditions	√								√		0	0	- -
Waste disposal	√								√		0	0	-
AMBIENT AIR													
Increased levels of dust, noise and Vibration					√		√				0	- - -	0
SAFETY													
More possibility of accidents	√								√		0	---	--

2.2.6. PAVEMENT SUB-PROJECTS

Pavement sub-projects will have high positive environmental, health and aesthetic impact. Basically inner cities of old towns will be paved. Thus providing an easy-to-clean, less dusty environment for city dwellers and their visitors.

Increased dust and traffic diversions during the construction phase and preparing of roadbed might cause temporary inconvenience for the public. The same counts for increased levels of noise, vibration and possibility of accidents. The contract documents under the LIPWP-AF should include the same provisions included under PWP-3 and PWP-4 for the mitigation of such negative impacts.

The negative impact that could occur from these sub-projects are mainly damage to the water pipes resulting in leakage of the water network which may also cause settlement of the soil underneath the roads and maybe some nearby buildings resulting in structural damage. Under PWP-II, the mitigation for such negative impact was by laying the water pipes over ground at the same level with the pavement or at the middle of the rainwater collection channel. In some cases, the pipes (galvanized steel) are laid at the edge of the street above the pavement.

Another positive impact of such sub-projects, which was implemented at some old cities, is that the pavement slope was utilized to harvest the storm water and utilized to irrigate the gardens inside these old towns.

Moreover, as in PWP-3 and PWP-4, water supply and sewerage installations should have to be considered before implementing the pavement sub-projects under the LIPWP-AF, so that the pavement will not be removed later when water and sanitation sub-projects are implemented.

Potential Impact Category: Pavement	Impact identification method						Impact Analysis method				Design Phase	Construction Phase	Operation Phase
	checklist	Matrices	networks	overlays & GIS	Professional Experience.	Other	professional	physical models	case studies & qualitative	other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
LAND USE													
Disputes over the use of land for new roads					√		√				-	0	0
Endangered species					√					√	0	0	0
Sensitive habitats					√					√	0	0	0
Species of commercial importance					√					√	0	0	0
Other Social impacts													
Gender					√							+	+
Community participation					√							+	+
COMMUNITY													
Population					√					√	0	0	++
Structure					√					√	0	0	+
Employment and Labour market	√									√	0	0	++
Distribution of income, goods and Services					√					√	0	0	+++
Customs, aspirations and attitudes					√					√	0	0	++
HEALTH													
Increased access	√						√				0	0	+++
Waste disposal	√								√		0	0	++
AMBIENT AIR													
Increased levels of dust, noise and Vibration					√		√				0	- - -	+
WATER													
Flooding by storm water					√				√		-	-	-
SAFETY													
More possibility of accidents	√								√		0	---	++

2.2.7. SOCIAL BUILDINGDS

In order to encourage social participation, the social buildings may be used for the meetings and capacity building and training. It can also create jobs for the society and create good environment for meeting and discussions for increase awareness of the society in different issues. In this respect, vocational training are implemented in co- ordination with the Ministry of Technical Education and Vocational Training and International NGOs who equip, operate and maintain the facilities.

Potential Impact Category: Social Buildings	**Impact identification method**						**Impact Analysis method**				**Design Phase**	**Construction Phase**	**Operation Phas**
	checklist	Matrices	networks	overlays & GIS	Professional Experience.	Other	professionl judgement	physical models perimentation	case studies & qualitative comparisons	other	+++ high positive impact ++ moderate positive impact + low positive impact 0 neutral impact - low negative impact - - moderate negative impact - - - high negative impact		
LAND USE													
Disputes over the use of land for the building site					√		√				- -	0	0
Endangered species					√					√	0	0	0
Sensitive habitats					√					√	0	0	0
Species of commercial importance					√					√	0	0	0
Other Social impacts													
Gender					√							+	+
Community participation					√							+	+
COMMUNITY													
Population					√					√	0	0	+
Structure					√					√	0	0	+
Employment and Labor market	√									√	0	++	+
Distribution of income, goods and Services					√					√	0	+	+
Customs, aspirations and attitudes					√					√	0	0	+++
HEALTH													
Increased awareness levels	√						√				0	0	+++
Unhygienic toilet (latrine) Conditions	√								√		0	0	- -
Waste disposal	√								√		0	0	-
AMBIENT AIR													
Increased levels of dust, noise and Vibration					√		√				0	- - -	0
SAFETY													
More possibility of accidents	√								√		0	---	--

2.2.8. PUBLIC SAFETY CONSIDERATIONS

During the construction phase of all sub-projects, there may be an increased risk of accidents involving local populations, especially children. These may result from one or a combination of the following:

- Unauthorized access to a construction site.
- An absence of control over general public access to construction sites,
- Conflict with construction vehicles and equipment,
- Poor site safety,
- Inadequate site management.

By its very nature, all construction activities generate elevated levels of accident risk. However, three factors suggest that the impacts from these sub-projects may be further increased:

- It is evident that a number of construction sites in Yemen lack proper management and in some cases are clearly dangerous and equally importantly that off site activities, such as construction traffic, are as poorly controlled.
- Widespread construction within the urban areas. Extensive linear construction sites along urban streets will expose large sections of the population to accident risks, especially children who use streets as play areas.
- The nature of the urban development is such that access routes for construction traffic is generally be poor; often comprising relatively narrow streets and lanes with no pedestrian facilities, vertical and horizontal curves with blind access etc.

2.2.9. LESSONS LEARNT FROM PREVIOUS PWP EXPERIENCE

Based on the experiences of the first four phases of PWP, the following could be observed and which should be considered under LIPWP-AF:

1. Women and Children. Recognizing the immense need for services benefiting women and children, the PWP considers this target group as the most important to respond to. Moreover, development and poverty alleviation cannot be achieved without taking into consideration the welfare of women and children. To meet this strategy, schools for girls, viable water sub-projects and health facilities are given the highest priority, as women and children are the main beneficiaries.

   Based on the lessons learned from implementation of previous PWP projects, several entry points were identified through which the impact for women will be increased, e.g.: by giving women more voice during the initial stages of sub-projects preparation through community consultations, by employing more female engineers during design, implementation and supervision, and by encouraging the short-term employment of female beneficiaries during implementation.

   To enhance women's participation in and benefit from the project, the LIPWP-AF Operations Manual will be updated to provide the operational basis for the expanded gender approach.

2. Education.
   - The Ministry of Education will raise awareness of environmental and hygiene within the school and the community as part of the educational tasks, the

awareness program should include the following aspects:

- Cleanliness of the classroom and the school yard.

- To take care of the trees in the school and to clarify the importance of the role of trees of the human life and the other creatures.

- Allocation of places and collectors to collect the daily garbage from inside and outside the school.

- Aware and educate the students (boys and girls) of the correct method to use the toilets, especially in elementary school, and increasing in the yearly degrees for the student who adhering by the rules of behavior and proper use of school toilets as well as correct environmental aspects at the school.

- Ministry of Education should hire one or two persons in each school in Yemen (depending on size of school) to dispose the garbage of the school and to clean the school toilets constantly, so the clean toilet all the time is encouraged the student (especially girls) to use it in times of need.
- Each school in Yemen (rural or urban) must contain a rain water harvesting tank, so water is available to run the toilets of schools properly, and Ministry of Education must work to provide this tank in the old school where there is no way to get the water.
- increase the number of bathrooms in the schools does not mean solving the problem, but the social workers in the Ministry of Education must apply their duty to educate the public and students that the solution lies in the proper use of toilets and the preservation of the school and the cleanliness is the solution, to spreading the interest to everyone in the school and reflected therefore in the behavior of the community outside the school.
- In very poor areas of water, should be considered in other types of latrine, such as dry latrine, but after test of pilot projects and measure the results of its success (operating + maintenance + environmental impact), in the case of complete success then encourage and educate students of schools of these areas to use these type of latrines in the right way.
- Ministry of Education is responsible to carry out operation, maintenance and periodic monitoring of schools in the broad sense to include the school building and staff and materials needed, where the Ministry of Education is the official body in the short term and long term after receiving the building of the party that implement the school.
- Issue interest of the environmental impact and how to mitigate the effect before, during and after the implementation of any development project, (large or small) in the planes of all the companies (either internal or external) and ministries that implement these projects in Yemen.

3. Health. The PWP responds to requests for health facilities, in areas that prove to be in critical need of health services and had plans for long-term sustainability. In the selection phase, it should be considered that a newly constructed health facility will be fully equipped and operated either by the MoPHP, or by an international NGO.

4. Water supply, Rainwater harvesting & Agriculture. The problem of water scarcity in Yemen has led to increased involvement in this sector. Activities undertaken by PWP are contributions to water supply schemes and the construction of rain water harvesting ponds and weirs. Moreover, to alleviate the groundwater depletion, rainwater harvesting has been extended over the water supply schemes which involve more groundwater abstraction which were

limited to at Tehama plain where the possibility of applying rainwater harvesting is limited. Since the PWP operates only in labor intensive activities, the contribution to water supply schemes is limited to the construction of networks and reservoirs.

5. Sanitation. The intervention of PWP in this sector is limited due to the fact that most requests do not comply with the environmental criteria. Only upgrading of existing facilities in urban areas can improve the environmental conditions. Sewerage systems are implemented in urban areas as an extension only whereby it is connected to the existing wastewater treatment. However, in rural areas, still a training and commitment of operation and maintenance might lead to not complying with the WB Operational policies. However, due to the bad need, the intervention is still including designing and implementing rehabilitation of some existing WWTP .

6. Roads. The main focus on this sector is stone paving of old neighborhoods of urban centers, characterized by old and historical significance, thus making them potential tourists' attractions. To preserve the cultural heritage and enhance the architecture of the old buildings, stones are selected that match with the surroundings. Furthermore, PWP undertakes the implementation of rural roads, in co- ordination with the Roads Maintenance Fund, to do the labor intensive components such as retaining walls, culverts and storm water drainage. Interestingly, an additional benefit of such roads in rural areas has proved to open a chance for women and children to shortcut the unpaved long route they would have to walk in order to reach their destinations. This has increased their chance in recruitment in the education and other specific business activities and jobs to create additional income in order to alleviate poverty. Therefore, the roads subprojects should be encouraged and appreciated.

7. Social Security and Vocational Training. Intervention in this important sector is in co- ordination with the Ministry of Technical Education and Vocational Training and International NGOs who equip, operate and maintain the facilities.

8. Community participation and beneficiary engagement. Many sub-project designs require active inputs for operation and maintenance (O&M) after being handed-over to the community. Ongoing O&M is needed especially for drinking water, rain-water harvesting, sewerage, and roads sub-projects, as well as for vocational training centers and health facilities and classrooms. Community participation and beneficiary engagement is critical from the earlier stages of the project cycle till the end and continue during the O&M for the sustainability of project benefits. The community participation mechanism will be strengthened to ensure that beneficiaries are actively engaged in the sub-project design, implementation and operation and maintenance.

9. Other factors. As in most developing countries, Yemen suffers from severe adverse environmental circumstances. Several factors such as high poverty levels, high population densities, lack of basic services like sewerage, migration, depletion of water sources etc. have exacerbated the situation.

3. MITIGATION PROGRAM

3.1. INTRODUCTION

The government of the Republic of Yemen is committed through the components of this project, to improve the quality of life of the rural populations. The LIPWP-AF will achieve this development objective through implementation of infrastructure schemes that include: building, rehabilitation and upgrading of hospitals, rural hospitals, health centers and health units; building, rehabilitation and upgrading of schools, community water schemes, rural roads and water catchment reservoirs.

PWP-IV has been assigned Environmental Category "B" in accordance with World Bank Operational Policy 4.01, "Environmental Assessment" and the LIPWP-AF will retain this category. Secondly, LIPWP-AF will exclude: (i) sub-projects that would require involuntary resettlement of people in accordance with World Bank safeguard policy OP 4.12; and (ii) any subproject that would involve transboundary aquifers or other international waterways in accordance with World Bank safeguard policy OP/BP 7.50. Furthermore, the LIPWP-AF would not damage archaeological and/or historical and/or religious sites. Sub-projects that might have any impact on these safeguard policies would be excluded. However, the project is classified Category "B" due to its potential environmental impacts associated with the construction of the rural infrastructure sub-projects.

Due to the nature of the project that maintains the individuality of sub-projects, that are implemented in different environmental conditions, chapter 2 includes the assessment of the potential impacts for each sub-project separately, and accordingly, chapter 3 recommends the necessary mitigation measures taking into account local environmental conditions and resources.

The LIPWP-AF will therefore undergo a screening process to define the environmentally and socially sensitive sub-projects and produce sub-project specific ESMPs for those sub-projects that might have negative environmental and social impacts**. This will continue to take place through contracting short-term local environmental and social specialists or a loca**l consulting firm to carry out individual sub-project environmental and social analyses and produce the specific ESMPs as required. This procedure has been followed under PWP-III and PWP IV with success.

An indicative TOR for this work is as follows:

3.1.1. TOR FOR THE WORK OF THE ENVIRONMENTALAND SOCIAL SPECIALIST

The Environmental and Social Specialist is required to carry out the following activities:

1. To conduct desk reviews for the documents of the proposed LIPWP-AF sub-projects, and to carry out environmental and social analyses, sub-project specific limited Environmental and Social Assessments (ESIAs) and specific Environmental and Social management Plans (ESMPs) for the environmentally sensitive sub-projects according to policy of the World Bank and the Yemen Environmental and Social Impact Assessment (ESIA) Policy Document.

2. To conduct office discussions with the concerned engineers of the LIPWP-AF.

3. To establish contact with the local and national EPA officials responsible for ESIA oversight as well as other relevant local and national authorities in the concerned governmental or non-governmental sectors and to develop joint activities when required.

4. To conduct field visits for selected number of sub-projects accompanied by staff members or Regional Officers of the PWP-PMU, to assess the existing environmental conditions on site and the potential environmental and social impacts associated with the proposed sub-projects.

5. To provide the results of the Environmental and Social Impact Analysis in the form of an ESIA and sub-project specific ESMP, to be submitted to the decision makers.

6. To conduct training workshops for the LIPWP-AF staff and engineers on ESIA and on the ESIA tools developed for the project.

7. To identify the sub-projects that need community mobilization and awareness programs and prepare such awareness programs for implementation before, during and upon completion of the sub-projects.

8. To be engaged in the supervision, monitoring and evaluation of the LIPWP-AF sub- projects.

3.1.2. PUBLIC CONSULTATION AND DISCLOSURE REQUIREMENTS

Although a full consultation process is not required for the Category "B" projects, the Government of Yemen has decided to undertake small-scale consultation processes, informational campaigns and training sessions for some of the sub-projects as part of the implementation arrangements. All of the sub- projects are demand driven, based on some form of community participation. Although the nature of these public consultations will ultimately be determined during the project design process, general guidelines and suggestions are given under this ESMF. This ESMF will be disclosed by the World Bank and the PWP-PMU in English and Arabic in-country as well as through the Bank's InfoShop.

During the EMP process for sub-projects, the sub-project applicant consults project-affected groups and local nongovernmental organizations (NGOs) about the sub-project's environmental aspects and takes their views into account. These consultations should be initiated as early as possible. For meaningful consultations between the sub-project applicant and project-affected groups, the sub-project applicant, assisted by the Project team, provides relevant material (e.g. the ESMF) in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted. In addition, the sub-project applicant must consult with such groups throughout Project implementation as necessary to address safeguards-related issues that affect them. Provisions and specifics, including budgets, will be included in the relevant TORs and subsequent safeguards documents.

3.2. RECOMMENDATIONS & MITIGATIONS

3.2.1. HEALTH SUB-PROJECTS

As in PWP-II, a general recommendation for the implemented health units/centers is that they should be provided with well-designed incinerators, built of local materials and located within the boundaries of the health facilities, taking into account the prevailing wind and to the location of the surrounding houses. For health units, the addition of built-in masonry workbenches finished with tiles would provide an easy-to-clean work surface for the staff of the health unit. Additional built-in concrete shelves, closets or cupboards could also be very practical for providing storage space for drugs, syringes, etc. Concrete benches can accommodate patients in the waiting area. This built in furniture provides an easy-to-clean heavy-duty alternative for the low quality and often un-hygienic furniture. An additional advantage of built in furniture is, that it is difficult to remove. The design of health facilities should comply with the design standards already established by the MoHPH.

The LIPWP-AF engineers should instruct the staff of the health facilities with the appropriate practices for the safe disposal of medical waste suggested by the MoPHP and WHO. The LIPWP-AF engineers should provide the staff of the health facilities with supporting documents, leaflets or posters produced by the Health Education Department of the MoPHP on the safe handling and disposal of medical and hazardous waste.

The PMU of LIPWP-AF should contact the MoPHP, MoPW and MoWE on the urgent need for training, on a national level, for the staff of health facilities on the safe handling and disposal of medical and hazardous waste. LIPWP-AF can collaborate with these three ministries in the organization of training workshops on the national or regional levels. Those ministries should also co-ordinate to provide all health facilities including the implemented or future health facilities with colored containers to help the process of separation of medical waste for easy and safe collection and disposal.

In the case of joint implementation of health sub-projects, LIPWP-AF engineers should hold meetings with all the concerned or implementing partners to clarify that all parties should carry out the recommended mitigation. It is important to identify the responsibilities of the different parties for improving the general environmental conditions around the implemented and future health facilities.

A boundary wall should confine health units, and no health unit or extension should be approved without firm guarantees on the staffing and equipping of the proposed facilities.

HEALTH SUB-PROJECTS

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Design Phase				
Land use	Disputes about designed project site on privately owned land, or disconcerting areas of public, touristic interest, disturbing wildlife etc.	Discuss the planned site with the communities and landowners to get approval. If the land cannot be obtained through voluntary land donation, it needs to change the design to communal owned land. Consider drop of sub-project if problems are not resolved.	The communities Local authorities LIPWP-AF design engineers	PWP Social specialist
Staff for health facility	Non functional health facility	Coordinate with MoPHP for staff before construction	MoPHP	PWP Environmental specialist
Medical waste	Spreading of diseases	Include an incinerator in the design	LIPWP-AF design engineers	PWP Environmental specialist
Health	Lack or failure of sanitation facilities	Add sanitation facilities to the design or upgrade existing facilities	LIPWP-AF design engineers	PWP Environmental specialist
Construction Phase				
Ambient Air	Increased levels dust, noise and vibration	Inform nearby houses. Avoid work during night hours.	Implementing contractors	PWP Environmental specialist
Safety	Increased possibility of Accidents	Protect construction site from unauthorized persons. Provide proper support for excavations to protect against their collapse. Improve the readiness of health facilities in the region to deal with emergency cases. Provide workers with protective clothing.	Implementing contractors Local authorities with MoPHP	PWP Environmental specialist

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Archaeo-logical find	Damaging important and/or precious archaeological finds	Contracts shall includes provisions for chance find. Training will take place for crew/supervisors, to spot potential archaeological finds. In the event of a potential find, liaise with the archaeological department at MoC or a local university for quick assessment and action.	PWP supervisors	PWP. MoC
Operation Phase				
Health	Improper medical waste disposal can cause spreading of diseases	Instruct staff on the use of the incinerator.	MoPHP	Environmental Specialist EPA Local NGOs

3.2.2. WATER HARVESTING RESERVOIR SUB-PROJECTS

In these kinds of sub-projects, it is strongly recommended that after defining the right sub-catchment area and the well-protected routes of the feeder channels, it is necessary that LIPWP-AF puts up-front as a requirement the community contribution of the proper building of these channels as a precondition to the start of the sub-project. The design of the water harvesting shall include the estimated share of the sub-catchment in relation to the entire catchment area to ensure a fair sharing of water resources within the main watershed.

It is strongly recommended that public collection points should only be provided to communities facing water shortages or the communities showing readiness to sustain the sanitary conditions around public collection points as part of their contribution. Those communities should be provided with sanitary public collection points with paved collection surfaces, the right fencing to protect from animals and children and proper drainage of the spilled water to the nearest tree bed or agricultural land. Those communities should also be encouraged to select a caretaker for the public collection point (a female would be ideal) who could be paid a minimum charge to keep the collection point well maintained and clean. This system should be avoided especially in areas epidemic with malaria or rift valley fever, and where the communities are unwilling to look after the place. It is recommended to advise such communities to have their contribution in the form of supplying piped networks.

Health and hygiene awareness is of crucial importance here and the LIPWP-AF team for social mobilization and environmental awareness should provide the required health and hygiene messages to the communities and train local NGOs to continue giving these messages. The TORs for this team can be found in Annex D & E. The team should prepare training manuals and education material for awareness messages for the different types of sub-projects

Large open reservoirs should be avoided in areas epidemic with vector borne diseases Initial water quality testing can be beneficial at the design stage of water catchment structures. The quality of the water can highly influence the decision on the type and size of the intake and the washing outlet as well as the management of the water use and frequency of cleaning the tank.

Communities should be advised on the importance of regular water quality testing and should be provided with different options of appropriate technology for the environmental sanitation in their villages. LIPWP-AF can associate its work with a local specialized NGO who can carry out these software activities with the communities in addition to conveying general awareness and health and hygiene messages and providing training on O&M of the systems.

Coordination and participation of the local or nearby health centers should be considered to benefit from the services and expertise available locally.

WATER CATCHMENT RESERVOIR SUB-PROJECTS

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Design Phase				
Health	Vector breeding sites	Closed conduit outlets Hygienic conditions around public collection points by paving at least 1 m^2 apron concrete slab under the water taps with proper drainage and fencing. Discuss the extent of local malaria problem with local health-care officials to emphasize on the importance of implementing their preventive and curative plans for vector control and malaria roll back.	LIPWP-AF design engineers	PWP Environmental specialist
Land use	Disputes about designed project site on privately owned land, or disconcerting areas of public, touristic interest, disturbing wildlife etc.	Discuss the planned site with communities and landowners to get approval. If land cannot be obtained through voluntary land donation, it needs to change the design to communal owned land or to land with less expected conflicts. Consider drop of sub-	The communities Local authorities LIPWP-AP design engineers	PWP social specialist
Construction Phase				
Health	Dumping of solid waste and wastewater in the catchment area	Emphasize the dangers of this attitude during the awareness sessions for the beneficiaries.	PWP extension and awareness team. Local NGOs	PWP Environmental specialist

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Air	Increased dust during excavation and preparing of drainage bed.	Inform nearby houses. Protect excavation works with proper shielding scaffolds. Spraying water during excavation might reduce the dust. Workers wear protective masks	Implementing contractors Local authorities, the community	PWP Environmental specialist
Noise	Increased levels of noise and vibration	Inform nearby houses. Avoid work during night hours.	Implementing contractors	PWP Environmental specialist
Archaeo-logical find	Damaging important and/or precious archaeological finds	Include in contracts provisions for chance find. Training will take place for crew/supervisors, to spot potential archaeological finds. In the event of a potential find, liaise with the archaeological department at MoC or a local university for quick assessment and action.	PWP supervisors	PWP. MoC
Safety	More possibility of Accidents	Protect construction site from trespassers. Provide proper support for trench sides to avoid collapsing. Improve the readiness of health facilities in the region to deal with emergency cases. Provide workers with protective clothing.	Implementing contractors Local authorities with MoPHP	PWP Environmental specialist
Operation Phase				
Health	The formation of vector breeding sites.	Cover the tanks or avoid malaria-infested areas.	Local community	Environmental Specialist EPA Local NGOs
Health	Dumping of solid waste and wastewater in the catchment area	Emphasize the dangers of this attitude during the awareness sessions for the beneficiaries.	PWP extension and awareness team. Local NGOs	PWP Environmental specialist

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
CONSULTATION AND TRAINING COMPONENTS				
Capacity building	The possibility of failure due to low capacity in O&M, administrative or financial management of the project.	Support training for local authority, local NGOs and members of the community on O&M of the system. Support training on the administrative and financial management of the project.	PWP to contract specialized local consulting firms.	Environmental Specialist EPA Local NGOs

3.2.3. WATER SUPPLY SUB-PROJECTS

If LIPWP-AF is completing water supply schemes either on its own or jointly with other implementing partners in areas with no environmental sanitation facilities, safe sanitary conditions should be a pre-condition to project implementation. It is necessary that communities of such areas be advised on the appropriate technologies that can be adopted in their areas to provide efficient wastewater disposal systems. LIPWP-AF with implementing partners, if that is the case, should provide the communities with the appropriate environmental sanitation designs to be used in their areas. If an adequate receiving system does not exist, then the sub-project may do more environmental damage than good. Therefore, if an adequate means of sewage treatment and/or disposal does not exist, and cannot be agreed upon, the water supply sub-project should not be implemented. LIPWP-AF should provide designs on alternative environmental sanitation appropriate technologies before the beginning of the projects.

In many of these sub-projects, protection around the water source is needed. The well head and the pump engine should be enclosed in a pump house, for protection and safety reasons. LIPWP-AF engineers should advise the pump operators to collect the used oil in barrels instead of spilling it causing a source of pollution to the well. The changed oil could be sold as fuel in public traditional baths or in many other ways like applying it as a protective coat to wood. Some new companies have emerged in such business of buying oil and refining it for sale, and to the extent it is feasible, arrangements with such companies should be included in the sub-project design for the proper operation and maintenance of the new works.

Piped systems deliver clean and safe water, but the pollution can occur at the household level due to wrong practices in storage and handling. If private tanks are placed in the yard without any protection to exclude animals and children from getting close to the tank, this will create dirty and unhygienic conditions around it. Ideally the water should be supplied to the private tank by a fixed connection and not by a loose plastic hose, with all kinds of dirt around it.

Health and hygiene awareness is of crucial importance here and the LIPWP-AF team for social mobilization and environmental awareness should provide the required health and hygiene messages to the communities and train local NGOs to continue giving these messages. The TORs for this team can be found in Annex D & E. The team should prepare training manuals and education material for awareness messages for the different types of sub-projects

The LIPWP-AF form of contract (bill of quantities) does include a separate component of all the mitigating measures as obligations on the implementing contractor.

The sub-project should have an intensive and vigorous environmental sanitation component to improve coverage and to address the other important issues of wastewater disposal, solid waste disposal and storm water drainage.

Schools, health centers and health units. Wherever possible schools and clinics should be provided with a good standard of sanitation i.e. a pour flush latrine with facilities for hand washing. This will be a key demonstration strategy in the health & hygiene campaign.

Health and Hygiene Education. A health and hygiene education campaign should be staged in project villages that will seek to i) impart knowledge and increase awareness of the need to improve hygiene practices, ii) promote good practice of collecting storing and using water, iii) improve hygienic practices for safe excreta disposal, and iv) promoting

environmental improvements through solid and liquid wastes management and disposal.

Water Quality Monitoring. All LIPWP-AF offices should coordinate with local LCs, NWSA or GARWSP branches to improve water quality monitoring. Water quality testing should occur after the development of a new source and at regular intervals thereafter. In addition testing should occur whenever a village detects a change in their water quality.

Water Quality Monitoring Parameters: The basic water quality monitoring parameters for drinking water include:

- Taste and color
- Electrical Conductivity
- pH
- Nitrates
- Hardness
- Total and Faecal Coliforms
- Flouride

The Project as a whole is in essence an environmental improvement initiative. However, in order to combat any potential negative impacts an environmental mitigation and monitoring plan has been prepared.

3.2.4. WATER SUPPLY ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

WATER SUPPLY SUB-PROJECTS

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and Cost	Monitoring Responsibility
Design Phase				
Air			LIPWP-AF design engineers	PWP Environmental specialist
Health	Vector breeding sites	Hygienic conditions around public collection points by paving at least 1 m² apron concrete slab under the water taps with proper drainage and fencing.	LIPWP-AF design engineers	PWP Environmental specialist
Water			LIPWP design engineers	PWP Environmental specialist
			LIPWP design engineers	PWP Environmental specialist

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Land use	Disputes about designed project site on privately owned land, or disconcerting areas of public, touristic interest, disturbing wildlife etc.	Discuss the planned site with landowners to get approval. If land cannot be obtained through voluntary land donation, it needs to change the design to communal owned land or to land with less expected conflicts. Consider drop of sub-project if problems are not resolved.	Local authorities LIPWP-AF design engineers	PWP Environmental specialist
	Disputes about designed route of pipes through privately owned land Disputes over the use of treated effluent for irrigation.	Discuss the planned route with landowners to get their approval. If the land cannot be obtained through voluntary land donation, it needs to change the planned route to avoid conflicts. Discuss effluent use, potential crops and disposal of effluent and sludge with land owners downstream of the treatment plant	Local authorities LIPWP design engineers	PWP Social specialist
Land resources	Ground water pollution from pit latrines polluting the underlying aquifer.	Ground water quality testing at source development and regular intervals. Soil/site inspection before latrine construction. Latrines to be more than 50 m from wells.	PWP NWASA GARWSP	PWP Environmental specialist
Construction Phase				
Air	Increased dust during excavation and burial of pipes.	Inform nearby houses. Protect excavation works with proper shielding scaffolds. Spraying water during excavation might reduce the dust. Workers wear protective masks	Implementing contractors Local authorities, the community	PWP Environmental specialist

Health	Removal and disposal of waste material from (existing) pits Collection , handling and disposal of solid waste.	Take health and safety measures when demolishing existing cesspits and on the disposal of sludge and polluted excavated soil. Dispose all polluted waste and soil to a safe location.	Implementing contractors	PWP Environmental specialist

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Infra-structure services	Possible destruction of water supply pipes, paved roads, cables, existing cesspits, .etc.	Avoid causing damages. Take health and safety measures when demolishing existing cesspits and on the disposal of sludge and polluted excavated soil. Dispose all polluted waste and soil to a safe location. Repair pavement on the completion of the Works	Implementing contractors	PWP Environmental specialist
Noise	Increased levels of noise and vibration	Inform nearby houses. Avoid work during night hours. Provide workers with Protection	Implementing contractors	PWP Environmental specialist
Safety	More possibility of Accidents	Protect work zones with portable scaffold sheets. Provide proper support for trench sides to protect against their collapse. Improve the readiness of health facilities in the region to deal with emergency cases. Provide workers with protective clothing.	Implementing contractors Local authorities with MoPHP	PWP Environmental specialist
Traffic	Disruptions of water supply and local access	Inform the affected houses in advance and keep disruptions as short as possible.	Implementing contractors	PWP Environmental specialist
Water	Pit latrines can pollute the underlying aquifer.	Ground water quality testing at source development and regular intervals. Soil/site inspection before latrine construction. Latrines to be more than 50 m from wells.	PWP	Initially PMU Local Government in future.

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Archaeo-logical find	Damaging important and/or precious archaeological finds	Contracts to include provisions for chance find. Training will take place for crew/supervisors, to spot potential archaeological finds. In the event of a potential find, liaise with the archaeological department at MoC or a local university for quick assessment and action.	PWP supervisors	PWP. MoC
Safety	More possibility of accidents	Protect construction site from trespassers. Improve the readiness of health facilities in the region to deal with emergency cases. Provide workers with protective clothing.	Implementing contractors Local authorities with MoPHP	PWP Environmental specialist
Operation Phase				
Health	The possible formation of vector breeding stagnant effluent ponds.	Ensure proper utilization or disposal of effluent and sludge. Take necessary actions for fighting vectors (spraying with insecticides, reclamation of stagnant pools, using nets on windows and beds, etc.)	Local Authorities Local NGOs MoPHP MAI NWASA GARWSP The community	Environmental Specialist EPA Local NGOs
	Health problems due improper effluent disposal.	Ensure safe final disposal of effluent from treatment ponds or reuse with extreme precaution to avoid direct contact with humans or animals. Provide training for selected members of the community on health and hygiene education	Local Authorities Local NGOs MoPHP MAI LCs NWASA GARWSP The community	Environmental Specialist EPA Local NGOs

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Land resources	Possible adverse impacts on soil conditions as a result of lower efficiency levels of the treatment plant.	Test the characteristics of sewage and the treated effluent. Consider options for upgrading the performance of the treatment facility. Provide training for local NGOs and members of the community on O&M of the system. Discuss the use of the effluent for irrigating non-edible crops (e.g., gardening nurseries, palm trees, cotton, etc.)	Local authorities LCs NWASA Land owners, NGOs, local communities	Environmental Specialist EPA Local NGOs
Land use	Disputes over the use of treated effluent for irrigation.	Discuss effluent use, potential crops and disposal of effluent and sludge with land owners downstream of the treatment plant	Local authorities LIPWP-AF design engineers	Environmental Specialist EPA Local NGOs
Water	Ground water Pollution from Pit latrines	Ground water quality testing at source development and regular intervals.	NWASA GARWSP	Environmental Specialist EPA Local NGOs
CONSULTATION AND TRAINING COMPONENTS				
Capacity building	The possibility of failure due to low capacity in O&M, administrative or financial management of the project.	Support training for local authority, local NGOs and members of the community on O&M of the system. Support training on the administrative and financial management of the project.	PWP to contract specialized local consulting firms.	Environmental and social Specialist EPA Local NGOs

3.2.5. SANITATIION SUB-PROJECTS

If LIPWP-AF is completing water supply schemes either on its own or jointly with other implementing partners in areas with no environmental sanitation facilities, safe sanitary conditions should be a pre-condition to project implementation. It is necessary that communities of such areas be advised on the appropriate technologies that can be adopted in their areas to provide efficient wastewater disposal systems. LIPWP-AF with

implementing partners, if that is the case, should provide the communities with the appropriate environmental sanitation designs to be used in their areas. If an adequate receiving system does not exist, then the sub-project may do more environmental damage than good. Therefore, if an adequate means of sewage treatment and/or disposal does not exist, and cannot be agreed upon, the water supply sub-project should not be implemented. LIPWP-AF should provide designs on alternative environmental sanitation appropriate technologies before the beginning of the projects.

In many of these sub-projects, protection around the water source is needed. The well head and the pump engine should be enclosed in a pump house, for protection and safety reasons. LIPWP-AF engineers should advise the pump operators to collect the used oil in barrels instead of spilling it causing a source of pollution to the well. The changed oil could be sold as fuel in public traditional baths or in many other ways like applying it as a protective coat to wood. Some new companies have emerged in such business of buying oil and refining it for sale, and to the extent it is feasible, arrangements with such companies should be included in the sub-project design for the proper operation and maintenance of the new works.

Piped systems deliver clean and safe water, but the pollution can occur at the household level due to wrong practices in storage and handling. If private tanks are placed in the yard without any protection to exclude animals and children from getting close to the tank, this will create dirty and unhygienic conditions around it. Ideally the water should be supplied to the private tank by a fixed connection and not by a loose plastic hose, with all kinds of dirt around it.

Health and hygiene awareness is of crucial importance here and the LIPWP-AF team for social mobilization and environmental awareness should provide the required health and hygiene messages to the communities and train local NGOs to continue giving these messages. The TORs for this team can be found in Annex D & E. The team should prepare training manuals and education material for awareness messages for the different types of sub-projects

Sewerage sub-projects have high positive health and environmental impacts. Negative impacts are limited to the application of safety measures during the construction phase for both the pedestrians and the laborers and to the unsanitary disposal of treated effluents and sludge. **The** LIPWP-AF **form of contract (bill of quantities) does include a separate component of all the mitigating measures as obligations on the implementing contractor.**

The sub-project should have an intensive and vigorous environmental sanitation component to improve coverage and to address the other important issues of wastewater disposal, solid waste disposal and storm water drainage. The sanitation component should have two main parts:

i) A sanitation promotion campaign, and

ii) Physical support to the construction of household and community based excreta disposal systems. This should be reinforced by health and hygiene education.

Sanitation promotion campaign. Social Mobilization Teams (SMT) should work with village water user associations and individuals to promote on-site latrine construction and maintenance, as well as the development of village environmental action plans. These village plans would include identifying environmental problems in the village and mobilizing local resources to address them, e.g. constructing rainwater drainage channels, identifying sites for the disposal of solid wastes, and digging waste pits if required. In support of the promotion campaign, demonstration latrines could be constructed at strategic locations such as village centers, schools and clinics. Latrine builder training

courses can be organized and the graduates given certificates of attendance. Also, when soil conditions permit it, the use of household soak-away for sullage (wastewater) disposal should be demonstrated and promoted. Other components of the promotion campaign will include fencing around and protecting water wells to keep animals from polluting the source, concrete aprons and drainage channels around public stand posts etc.

Schools, health centers and health units. Wherever possible schools and clinics should be provided with a good standard of sanitation i.e. a pour flush latrine with facilities for hand washing. This will be a key demonstration strategy in the health & hygiene campaign.

Health and Hygiene Education. A health and hygiene education campaign should be staged in project villages that will seek to i) impart knowledge and increase awareness of the need to improve hygiene practices, ii) promote good practice of collecting storing and using water, iii) improve hygienic practices for safe excreta disposal, and iv) promoting environmental improvements through solid and liquid wastes management and disposal.

Protection of Ground Water Sources. An important issue that should be taken into account is the possible pollution of ground water sources. A number of research studies have confirmed that pathogens and other pollutants do not travel far from a pit latrine or septic tank in homogeneous soils, particularly as the volumes of water involved are very low. However, the risk of pollution relates to the nature of the soil and the depth of the ground water table and each site should be assessed before construction to ensure that there is no water pollution potential. Current good practice adopted in many countries is that latrines or septic tanks should not be located within 50 meters of a water well or borehole.

Water Quality Monitoring. All LIPWP-AF offices should coordinate with local LCs, NWSA or GARWSP branches to improve water quality monitoring. Water quality testing should occur after the development of a new source and at regular intervals thereafter. In addition testing should occur whenever a village detects a change in their water quality.

Water Quality Monitoring Parameters: The basic water quality monitoring parameters for raw and treated wastewater or irrigation water include:

- pH and Salinity
- Biological Oxygen Demand
- Chemical Oxygen Demand
- Total and Faecal Coliforms

The Project as a whole is in essence an environmental improvement initiative. However, in order to combat any potential negative impacts an environmental mitigation and monitoring plan has been prepared.

WATER SUPPLY AND SEWERAGE SUB-PROJECTS

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and Cost	Monitoring Responsibility
Design Phase				
Air	Designed location of treatment plant causing occasional offensive smells.	Treatment plant minimum distance to the nearest end of the city to be not less than 0.5 – 1 km, depending on the direction of prevailing wind, and taking future development trends into consideration. Length of facultative oxidation ponds should be in the direction of the prevailing wind.	LIPWP-AF design engineers	PWP Environmental specialist
Health			LIPWP-AF design engineers	PWP Environmental specialist
Water	Designed locations of treatment plant, points of disposal of effluent, sludge drying beds or other sludge treatment causing pollution of water resources.	Minimum distance between sources of pollution and water sources should not be less than 30 m.	LIPWP design engineers	PWP Environmental specialist
	Insufficient treatment capacity for the designed treatment ponds.	Design the sizes and numbers of treatment ponds based on the following criteria: - 20 years design period. - 90% efficiency removal of BOD for the design of treatment ponds.	LIPWP design engineers	PWP Environmental specialist

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Land use	Disputes about designed project site on privately owned land, or disconcerting areas of public, touristic interest, disturbing wildlife etc.	Discuss the planned site with landowners to get approval. If land cannot be obtained through voluntary land donation, it needs to change the design to communal owned land or to land with less expected conflicts. Consider drop of sub-project if problems are	Local authorities LIPWP-AF design engineers	PWP Environmental specialist
	Disputes about designed route of pipes through privately owned land Disputes over the use of treated effluent for irrigation.	Discuss the planned route with landowners to get their approval. If the land cannot be obtained through voluntary land donation, it needs to change the planned route to avoid conflicts. Discuss effluent use, potential crops and disposal of effluent and sludge with land owners downstream of the treatment plant	Local authorities LIPWP design engineers	PWP Social specialist
Land resources	Ground water pollution from pit latrines polluting the underlying aquifer.	Ground water quality testing at source development and regular intervals. Soil/site inspection before latrine construction. Latrines to be more than 50 m from wells.	PWP NWASA GARWSP	PWP Environmental specialist
Construction Phase				
Air	Increased dust during excavation and burial of pipes.	Inform nearby houses. Protect excavation works with proper shielding scaffolds. Spraying water during excavation might reduce the dust. Workers wear protective masks	Implementing contractors Local authorities, the community	PWP Environmental specialist

Health	Removal and disposal of waste material from (existing) pits Collection , handling and disposal of solid waste.	Take health and safety measures when demolishing existing cesspits and on the disposal of sludge and polluted excavated soil. Dispose all polluted waste and soil to a safe location.	Implementing contractors	PWP Environmental specialist

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Infra-structure services	Possible destruction of water supply pipes, paved roads, cables, existing cesspits, .etc.	Avoid causing damages. Take health and safety measures when demolishing existing cesspits and on the disposal of sludge and polluted excavated soil. Dispose all polluted waste and soil to a safe location. Repair pavement on the completion of the Works	Implementing contractors	PWP Environmental specialist
Noise	Increased levels of noise and vibration	Inform nearby houses. Avoid work during night hours. Provide workers with Protection	Implementing contractors	PWP Environmental specialist
Safety	More possibility of Accidents	Protect work zones with portable scaffold sheets. Provide proper support for trench sides to protect against their collapse. Improve the readiness of health facilities in the region to deal with emergency cases. Provide workers with protective clothing.	Implementing contractors Local authorities with MoPHP	PWP Environmental specialist
Traffic	Disruptions of water supply and local access	Inform the affected houses in advance and keep disruptions as short as possible.	Implementing contractors	PWP Environmental specialist
Water	Pit latrines can pollute the underlying aquifer.	Ground water quality testing at source development and regular intervals. Soil/site inspection before latrine construction. Latrines to be more than 50 m from wells.	PWP	Initially PMU Local Government in future.

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Archaeo-logical find	Damaging important and/or precious archaeological finds	Contracts to include provisions for chance find. Training will take place for crew/supervisors, to spot potential archaeological finds. In the event of a potential find, liaise with the archaeological department at MoC or a local university for quick assessment and action.	PWP supervisors	PWP. MoC
Safety	More possibility of accidents	Protect construction site from trespassers. Improve the readiness of health facilities in the region to deal with emergency cases. Provide workers with protective clothing.	Implementing contractors Local authorities with MoPHP	PWP Environmental specialist
Operation Phase				
Health	The possible formation of vector breeding stagnant effluent ponds.	Ensure proper utilization or disposal of effluent and sludge. Take necessary actions for fighting vectors (spraying with insecticides, reclamation of stagnant pools, using nets on windows and beds, etc.)	Local Authorities Local NGOs MoPHP MAI NWASA GARWSP The community	Environmental Specialist EPA Local NGOs
	Health problems due improper effluent disposal.	Ensure safe final disposal of effluent from treatment ponds or reuse with extreme precaution to avoid direct contact with humans or animals. Provide training for selected members of the community on health and hygiene education	Local Authorities Local NGOs MoPHP MAI LCs NWASA GARWSP The community	Environmental Specialist EPA Local NGOs

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Land resources	Possible adverse impacts on soil conditions as a result of lower efficiency levels of the treatment plant.	Test the characteristics of sewage and the treated effluent. Consider options for upgrading the performance of the treatment facility. Provide training for local NGOs and members of the community on O&M of the system. Discuss the use of the effluent for irrigating non-edible crops (e.g., gardening nurseries, palm trees, cotton, etc.)	Local authorities LCs NWASA Land owners, NGOs, local communities	Environmental Specialist EPA Local NGOs
Land use	Disputes over the use of treated effluent for irrigation.	Discuss effluent use, potential crops and disposal of effluent and sludge with land owners downstream of the treatment plant	Local authorities LIPWP-AF design engineers	Environmental Specialist EPA Local NGOs
Water	Ground water Pollution from Pit latrines	Ground water quality testing at source development and regular intervals.	NWASA GARWSP	Environmental Specialist EPA Local NGOs
CONSULTATION AND TRAINING COMPONENTS				
Capacity building	The possibility of failure due to low capacity in O&M, administrative or financial management of the project.	Support training for local authority, local NGOs and members of the community on O&M of the system. Support training on the administrative and financial management of the project.	PWP to contract specialized local consulting firms.	Environmental and social Specialist EPA Local NGOs

3.2.6. SCHOOLS

Safety measures to protect students from traffic accidents should well be considered in the design, if the school is to be located on a main road. Rails along sidewalks (should be included in the design if none exists) should be fixed along the roadsides extending at least 10m on each side beyond the width of the school from both sides. Signposts to inform drivers of a school existence on their way should be fixed on both sides of the road at 1 km distance from approaching the end of the school width from the two directions of the traffic. Speed bumps should be built on the road 50 m from the farthest width ends of the school building to control the speed of vehicles passing in front of the school. Zebra crossing markings should be provided on the road for the safe crossing of the students. Schools built in hot regions, with electricity services provided, should have fans installed in the rooms, and if possible, drinking water coolers can be installed to provide cool drinking water for the students. Steel mesh to protect students from escaping from the windows should be implemented as well as screen mesh to prevent against mosquitoes.

It is recommended to build toilets with new schools or with extensions, especially if the area is served with a water supply and sanitation sub-project which could be really used for that purpose. School designs should comply with design standards already established by the Ministry of Education.

After the completion of a school with sanitary facilities, the school could be taken as the example for a safe sanitation system. LIPWP-AF can arrange with the school management to encourage the students to keep the toilets clean, through holding competitions between classes and offering "Good Conduct" marks or prizes as incentives for the winning class or students. Science and social studies classes can be utilized to convey health and hygiene education messages and the children can be active advocates carrying those messages to their homes. The health unit staff and local NGOs can be also approached to play an active role in spreading health messages on safe sanitation and improvement in general health conditions in the community.

3.2.7. SCHOOLS ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

SCHOOLS				
Item	**Potential Negative Impact**	**Mitigation Measure**	**Implementation Responsibility and cost**	**Monitoring Responsibility**
Design Phase				
Land use	Disputes about designed project site on privately owned land, or disconcerting areas of public, touristic interest, disturbing wildlife etc.	Discuss the planned site with landowners to get approval. If the land cannot be obtained through voluntary land donation, it needs tochange the design to communal owned land or to land with less expected conflicts.	Local authorities LIPWP-AF design engineers	PWP Social specialist
Health	Lack or failure of sanitation facilities	Add sanitation facilities to the design or upgrade existing facilities.	LIPWP-AF design engineers	PWP Environmental specialist
Construction Phase				
Noise	Increased levels of noise and vibration	Inform nearby houses. Avoid work during night hours.	Implementing contractors	PWP Environmental specialist
Archaeo-logical find	Damaging important and/or precious archaeological finds	Training will take place for crew/supervisors, to spot potential archaeological finds. In the event of a potential find, liaise with the archaeological department at MoC or a local university for quick assessment and action.	PWP supervisors	PWP, MoC

Item	Potential Negative Impact	Mitigation Measure	Implementation Responsibility and cost	Monitoring Responsibility
Safety	More possibility of accidents	Protect construction site from trespassers. Provide proper support for trench sides to protect against their collapse. Improve the readiness of health facilities in the region to deal with emergency cases. Provide workers with protective clothing.	Implementing contractors Local authorities with MoPHP	PWP Environmental specialist

3.3. Grievance Redress Mechanism

Grievance mechanisms provide a formal avenue for affected groups or stakeholders to engage with the project implementers or owners on issues of concern or unaddressed impacts. Grievances are any complaints or suggestions about the way a project is being implemented. They may take the form of specific complaints, concerns and suggestions about routine project activities. Identifying and responding to grievances supports the development of positive relationships between projects and beneficiaries and the potentially affected groups/communities, and other stakeholders.

Grievances can be an indication of growing stakeholder concerns (real and perceived) and can escalate if not identified and resolved. The management of grievances is therefore a vital component of stakeholder management and an important aspect of risk management for a project. Projects may have a range of potential adverse impacts to people and the environment in general, identifying grievances and ensuring timely resolution is therefore very necessary. As such the ESMF has developed a grievance management process to serve as a guide during project implementation.

Stage 1: If any persons have any complaints, concerns or suggestions with the sub-project design and implementation, he or she can lodge an oral or written grievance through mail, email, or phone text message to the following agencies: a) the local council at district level; b) The Regional office of LIPWP-AF. In case an oral complaint is made, it will be written on paper by the receiving unit. The above issue will be resolved within 15 days.

Stage 2: If the persons are not satisfied with the decision of the local council or the Regional LIPWP-AF office, he or she can bring the complaint to the attention to the Governor office within one month from the date of the receipt of the decision. The issue shall be resolved within 15 days.

Stage 3: If the person is not satisfied with the decision of the Governor Office, he or she can bring the complaint to the attention of the LIPWP-AF central Office within one month from the date of the receipt of the decision.

Stage 4: Once the LIPWP-AF central Office receives the complaints. It needs to be resolved within one months in coordination with regional PWP office and local government.

3.4. LIPWP-AF Monitoring Plan

The sub-project applicant, as assisted by the LIPWP-AF Project team and local Ministry staff, is required to supervise the provisions of the EMP during constructional and operational phases of the sub-project. The safeguards specialist consultant hired by the LIPWP-AF PMU, will be in charge of monitoring and evaluating safeguard compliance of the entirety of the subprojects, as guided by the ESMF. The individual sub-project EMP monitoring reports will provide information about key environmental and social impacts of the project, effectiveness of mitigation measures, and any outstanding issues to be remedied. The PMU will include a section on safeguards compliance in each progress report which will be submitted to the Ministry of Planning and international cooperation and the World Bank, with input from local government and other Ministries as needed.

Key objectives of the monitoring plan include:

- Enabling the local government and the World Bank to evaluate the success of mitigation as part of project supervision.
- Allowing corrective actions to be taken whenever needed.

The plan contains objectives of monitoring, and specific targets to achieve, as well as main elements of monitoring, e.g. parameters to be monitored, full description of methods and equipment to be used for monitoring, sampling locations, frequency of measurements, threshold limits (per national and international standards), corrective action procedures, personnel responsible for monitoring, reporting and communication procedures. See Appendix C for an example of an Inspection Checklist for the Construction Phase of a Sub-Project and see Appendix D for Terms of Reference for Reporting of Sub-Project Field Monitoring .

Monitoring and procedures are set out in a way that:

- Early detection of conditions that necessitate particular mitigation measures is ensured
- Information on the progress and results of mitigation is furnished prior to applying monitoring plan,

Monitoring includes:

- Visual observations
- Selection of environmental and social parameters at specific locations;
- Sampling and regular testing of these parameters

3.5. Additional Third Party Monitoring (TPM)

Below is the general description of the monitoring agent services from the Terms of Reference (TOR) drawn for the TPM for all of the projects under implementation in the Yemen country portfolio, as follows:

“To verify that the physical implementation of projects is in accordance with signed contracts and in accordance to the agreed social and environmental guidelines; (b) verification that the completed project is serving the community as envisioned (i.e. water is being delivered to project beneficiaries and is of reasonable quality).”

To carry out the above services, the Monitoring Agent will: (a) prepare monthly, mid-term, and final implementation reports: and (b) carry out physical verification with digital photographs of ongoing works and goods supplied, alerting the Bank to deficiencies in implementation and following up on the correction of these deficiencies. This will be done for a selected subset of each of the World Bank projects, i.e. a selected number of LIPWP-AF subprojects.

Specific to LIPWP-AF, the TPM will report on (1) quality and progress of works vis-à-vis the plan and contract document (2) abidance by the contractor regarding disposal of unwanted materials, if any, to the designated dump sites (3) strict adherence of the contractor with regard to workers, passerby, etc safety procedures on the construction sites and, (4) any other ***specific*** issues that the TPM team wants to highlight.

Specific checklist to collect environmental and social safeguards information: Based on each specific contract, TPM should provide comments on any safeguards issues included in that particular contract. In case there are issues not mentioned in each of the specific contract and the TPM team found that there are important and relevant issues not mentioned in the contract, the TPM team may provide its comments and or recommendations, if any, in the report for that particular site. A sample of a typical Third Party Monitoring (TPM) Checklist for Environmental Safeguards Aspects is attached in Appendix G.

3.6. INSTITUTIONAL STRENGTHING AND CAPACITY BUILDING PLAN

Costs and Responsibilities: The cost for these environmental and social mitigation and monitoring measures shall be included in the sub-project costs. LIPWP-AF staff would be responsible for the initial implementation of the mitigation initiative, i.e. testing and monitoring. Subsequently, the responsibility for regular monitoring shall fall upon the local government i.e. the Governorate under the provisions of the new Local Government legislation. The responsibility and supervision for emptying of pit latrines or septic tanks, as well as removal and treatment of sludge, will be at the Governorate or district level, even if the actual job is contracted out to a private entrepreneur. Should the LIPWP-AF work in a small town in which there is a need to empty cesspits and septic tanks, it would be conditional that the local authority provide a suitable vacuum truck (of approx. $35,000) or contract a private sector service provider.

The main mitigation costs to be borne by LIPWP-AF, other than the ones already included in the project design and in contract conditions, are in the field of capacity building and education for PWP staff, contractors, NGOs and beneficiaries. Other costs could be for the production of training manuals and awareness materials. A cost estimate for these activities recommended by this EMP is given below.

Cost (USD)	Capacity building courses
2000/training	2-day training on ESIA for PWP staff and consultants (once a year)
2000/training	2-day training on ESIA for PWP contractors (once a year)
62500/year	2-day training workshops on environmental and social awareness for NGOs and sub-projects beneficiaries where needed (per diems and transport).
5000	Production of environmental and social awareness materials (brochures, posters, fliers, etc.)
5000	Environmental and social awareness campaigns carried out by local NGOs
3000	Training on water sampling and testing carried out by a specialized institution.
20,000	international workshops for the PWP key staff

3.7. CONCLUSIONS

One of the overall goals of the project is to provide the needed infrastructure to improve the access to public services in rural areas and thereby improve the health and quality of life for the rural inhabitants. This will mainly be achieved by improving drinking water quality and quantity and by reducing indiscriminate defecation and isolating human excreta from the general environment. Water quality and quantity will be improved through the construction and rehabilitation of water schemes and by introducing water quality testing. Excreta disposal will mainly be improved through the promotion of a program of latrine building. In addition, by providing a supporting health and hygiene education campaign, hygienic behavior will be improved, which will ensure the maximum, benefits from the investment will be obtained. The environmental review concludes that the project will generate very positive environmental impacts.

Moreover, with the proposed mitigation measures, the project does not present any significant environmental risks.

4 PWP-IV MON I T O RING PLAN

`4.1 MONITORING PROGRAM

Phase	When	What	Who	How
DESIGN WORKS	During design and preparations of bill of quantities	• Mitigating measures included in the design of sub-projects. • Mitigating measures cost included in the bill of quantities of the sub-project.. • PMU awareness activities are carried out if recommended by EMP.	Environmental Specialist; Social Specialist PWP engineers; PMU unit	Review of sub-project designs and bills of quantities. Review of awareness program materials before the start of the activities and reviewing the reports and indicators after conducting the program. Review the land needed for the sub-project and the approaches obtaining the land
CONSTRUCTION WORKS	monthly	Health and safety measures.: • protective clothes • site protection • disposal of hazardous materials • readiness of heath facilities for emergencies • normal working hours (not more than 8 hours /day)	Environmental Specialist; Local NGOs; Local Authorities; PWP engineers.	. Site inspection checklists and photos.
	monthly	Noise and dust levels • ear protection and dust masks for workers • no work at night time • spray water		Site inspection checklists and photos.
	monthly	Traffic diversion and work progress in stretches.		Site inspection checklists and photos.
OPERATION WORKS Health	Semi-annually (for one year after the start of operation)	Performance of health facility General hygiene conditions Safe disposal of medical waste	Environmental Specialist Local Authorities MoPHP, EPA, Local NGOs The community PWP	Visual inspection Interviews with staff and community members

Phase		When	What	Who	How
	Water catchments	Semi-annually (for one year after the start of operation)	Water quality tests for: • EC • pH • Conductivity • Hardness • Total Coliform Inspection of feeder canals	Environmental Specialist Local Authorities NWASA, GARWSP, EPA, Local NGOs The community PWP	Laboratory tests results WHO and Yemeni standards for drinking and irrigation water Visual inspection
	Rural roads	One year after the start of operation	Check planting trees along the routes	Environmental Specialist Local Authorities Local NGOs The community	Visual inspection at the routes
	Schools	One year after the start of operation	Hygiene check for sanitation facilities	Environmental Specialist Local Authorities Local NGOs The community	Visual inspection

Phase		When	What	Who	How
	Water supply and Sanitation	Semi-annually (for one year after the start of operation)	Proper operation of the network. Efficiency of treatment ponds. Effluent quality tests for: • BOD • PH • Conductivity • Faecal Coliforms Reuse of effluent and types of irrigated crops. Health and safety of workers and farmers. Capacity building programmes. Training of members of community or local NGOs on health & hygiene awareness	Environmental Specialist Local Authorities NWASA, GARWSP EPA, Local NGOs The community PWP MAI	Monitoring checklists Visual inspection at the scheme routes and at manholes. Samples collected from outlet of treatment works. Focus groups with communities to evaluate the effectiveness of health and hygiene awareness campaigns Checks on courseware qualities for capacity building programs (Administrative, financial and O&M) Interviews with awareness teams

Appendix A: Chance Find Procedures

Contracts for civil works involving excavations should normally incorporate procedures for dealing with situations in which buried physical cultural resources (PCR) are unexpectedly encountered. The final form of these procedures will depend upon the local regulatory environment, including any chance find procedures already incorporated in legislation dealing with antiquities or archaeology. For JESSRP, chance finds procedures contain the following elements:

1. PCR Definition
In some cases the chance finds procedure is confined to archaeological finds; more commonly it covers all types of PCR. In the absence of any other definition from the local cultural authorities, the following definition could be used: "movable or immovable objects, sites, structures or groups of structures having archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance".

2. Ownership
The identity of the owner of the artifacts found should be ascertained if at all possible. Depending on the circumstances, the owner could typically be, for example, the state, the government, a religious institution, the land owner, or could be left for later determination by the concerned authorities.

3. Recognition
As noted above, in PCR-sensitive areas, recognition and confirmation of the specific PCR may require the contractor to be accompanied by a specialist. A clause on chance finds should be included in every contractor's specifications.

4. Procedure upon Discovery
Suspension of Work
If a PCR comes to light during the execution of the works, the contractor shall stop the works. Depending on the magnitude of the PCR, the contractor should check with MOMA for advice on whether *all works* should be stopped, or only the works immediately involved in the discovery, or, in some cases where large buried structures may be expected, all works may be stopped within a specified distance (for example, 50m) of the discovery. MOMA's decision should be informed by a qualified archaeologist.

After stopping work, the contractor must immediately report the discovery to the Resident Engineer.The contractor may not be entitled to claim compensation for work suspension during this period. The Resident Engineer may be entitled to suspend work and to request from the contractor some excavations at the contractor's expense if he thinks that a discovery was made and not reported.

Demarcation of the Discovery Site
With the approval of the Resident Engineer, the contractor is then required to temporarily demarcate, and limit access to the site.

Non-Suspension of Work
The procedure may empower the Resident Engineer to decide whether the PCR can be removed and for the work to continue, for example in cases where the find is one coin.

Chance Find Report
The contractor should then, at the request of the Resident Engineer, and within a specified time period, make a *Chance Find Report*, recording:
· Date and time of discovery;
· Location of the discovery;
· Description of the PCR;
· Estimated weight and dimensions of the PCR;
· Temporary protection implemented.

The *Chance Find Report* should be submitted to the Resident Engineer, and other concerned parties as agreed with the cultural authority, and in accordance with national legislation. The Resident Engineer, or other party as agreed, is required to inform the cultural authority accordingly.

Arrival and Actions of Cultural Authority

The cultural authority undertakes to ensure that a representative will arrive at the discovery site within an agreed time such as 24 hours, and determine the action to be taken. Such actions may include, but not be limited to:

- Removal of PCR deemed to be of significance;
- Execution of further excavation within a specified distance of the discovery point;
- Extension or reduction of the area demarcated by the contractor.

These actions should be taken within a specified period, for example, 7 days. The contractor may or may not be entitled to claim compensation for work suspension during this period. If the cultural authority fails to arrive within the stipulated period (for example, 24 hours), the Resident Engineer may have the authority to extend the period by a further stipulated time. If the cultural authority fails to arrive after the extension period, the Resident Engineer may have the authority to instruct the contractor to remove the PCR or undertake other mitigating measures and resume work. Such additional works can be charged to the contract. However, the contractor may not be entitled to claim compensation for work suspension during this period.

Further Suspension of Work

During this 7-day period, the Cultural authority may be entitled to request the temporary suspension of the work at or in the vicinity of the discovery site for an additional period of up to, for example, 30days.The contractor may, or may not be, entitled to claim compensation for work suspension during this period. However, the contractor will be entitled to establish an agreement with the cultural authority for additional services or resources during this further period under a separate contract with the cultural authority.

1- ESIA Screening Checklist for Health Units/Centres

Project Name : .....

Project ID:.....

Aspects of ESIA	Checklist questions Will the new health unit:	Yes	No	Additional data needed
Sources of Impact	1. be an extension of an existing one	☐	☐	☐
	2. raise land ownership problems	☐	☐	☐
	3. be close to a market place or a heavily crowded area (attach copy of sketch of proposed location)	☐	☐	☐
	4. be run by sufficiently qualified personnel	☐	☐	☐
	5. affect water sources	☐	☐	☐
	6. affect sites of historical or cultural importance	☐	☐	☐
Receptors of Impact	7. affect agricultural land	☐	☐	☐
	8. affect the life of surrounding human settlements	☐	☐	☐
	9. affect the life of plants or animals of special importance	☐	☐	☐
Environmental Impacts	10. be a source of hazardous solid, liquid or gaseous waste (e.g. infected syringes or bandages, expired medicines, chemicals, gases, etc.)	☐	☐	☐
	11. during construction, present a significant pollution hazard to workers and local communities	☐	☐	☐
	12. once operational, present a significant pollution risk to potable water supplies	☐	☐	☐
	13. not disturb the social structure of the surroundings	☐	☐	☐
Mitigating measures	14. be likely to require mitigating measures that result in the project being financially or socially unacceptable	☐	☐	☐
	15. require safety instructions with regards to the disposal of hazardous waste	☐	☐	☐
Comments	I recommend that the subproject will have no significant **adverse environmental impacts.**			☐
	I recommend that the subproject may have significant adverse environmental impacts and requires further analysis			☐
	All the required mitigating measures have been included within the design and contract conditions for the construction and operation phases.			☐
	Name and signature of PWP engineer	date		
	Name and signature of environmental specialist	date		

2- ESIA Screening Checklist for Rain Water Harvesting Reservoirs Projects

Project Name .....
Project ID .....

Aspects of ESIA	Checklist questions Will the project:	Yes	No	Additional data needed
Sources of Impact	1. Be an extension of an existing one	□	□	□
	2. Raise land ownership problems	□	□	□
	3. Require the acquisition or conversion of significant areas of land	□	□	□
	4. Result in significant quantities of eroded material	□	□	□
Receptors of Impact	5. Flood or affect otherwise areas which support conservation worthy terrestrial or aquatic ecosystems, flora or fauna	□	□	□
	6. Flood or affect otherwise areas which will effect the livelihoods of local people (e.g. affect local industry, agriculture, livestock or fish stocks)	□	□	□
	7. Involve the passage of feeder canals close to human settlements	□	□	□
	8. Affect water sources (including transboundary aquifers)	□	□	□
	9. Affect sites of historical or cultural importance	□	□	□
	10. Cause the spread of diseases due to pollution of the catchment area	□	□	□
Environmental Impacts	11. Cause a noticeable permanent or seasonal reduction in the volume of ground or surface water supply	□	□	□
	12. Present a significant health risk through the use of water for drinking	□	□	□
	13. Present a significant health risk due to vector breeding	□	□	□
	14. Induce secondary development, e.g. in the form of entrepreneurial services for construction and operational	□	□	□
Mitigating measures	15. Be likely to require mitigating measures that result in the project being financially or socially unacceptable	□	□	□
Comments	**I recommend that the subproject will have no significant adverse environmental impacts.**	□		
	I recommend that the subproject may have significant adverse environmental impacts and requires further analysis.	□		
	All the required mitigating measures have been included within the design and the contract conditions for the construction and operation phase.	□		
	Name and signature of PWP engineer	Date		
	Name and signature of environmental specialist	Date		

3- ESIA Screening Checklist for Rural Water Projects

Project Name .....
Project ID .....

Aspects of ESIA	Checklist questions Will the project:	Yes	No	Additional data needed
Sources of Impact	1. Be an extension of an existing one	□	□	□
	2. Raise land ownership problems	□	□	□
	3. Require the acquisition or conversion of significant areas of land	□	□	□
	4. Result in significant quantities of eroded material, effluent or solid wastes	□	□	□
Receptors of Impact	5. Flood or affect otherwise areas which support conservation worthy terrestrial or aquatic ecosystems, flora or fauna	□	□	□
	6. Flood or affect otherwise areas which will effect the livelihoods of local people (e.g. affect local industry, agriculture, livestock or fish stocks	□	□	□
	7. Involve siting sanitation treatment facilities close to human settlements	□	□	□
	8. Affect water sources (including transboundary aquifers)	□	□	□
	9. Affect sites of historical or cultural importance	□	□	□
	10. Cause the spread of diseases due to lack of sanitation services, the creation of stagnant water pools, pollution caused by the delivery	□	□	□
Environmental Impacts	11. Cause a noticeable permanent or seasonal reduction in the volume of ground or surface water supply	□	□	□
	12. Present a significant pollution risk through liquid, solid or gaseous wastes to humans, sources of water extraction, conservation worthy aquatic ecosystems and species, or commercial fish stocks	□	□	□
	13. Change the local hydrology of surface water-bodies, such that conversation-worthy or commercially significant fish stocks are affected	□	□	□
Mitigating measures	14. Induce secondary development, e.g. along access roads, or in the form of entrepreneurial services for construction and operational activities	□	□	□
	15. Be likely to require mitigating measures that result in the project being financially or socially unacceptable			

Comments		
	I recommend that the subproject will have no significant adverse environmental impacts.	□
	I recommend that the subproject may have significant adverse environmental impacts and requires further analysis.	□
	All the required mitigating measures have been included within the design and the contract conditions for the construction and operation phase.	□
	Name and signature of PWP engineer	date
	Name and signature of environmental specialist	date

4- ESIA Screening Checklist for Sanitation Projects

Project Name .....
Project ID .....

Aspects of ESIA	Checklist questions Will the project:	Yes	No	Additional data needed
Sources of Impact	1. Be an extension of an existing one	□	□	□
	2. Raise land ownership problems	□	□	□
	3. Require the acquisition or conversion of significant areas of land	□	□	□
	4. Result in significant quantities of eroded material, effluent or solid wastes	□	□	□
Receptors of Impact	5. Flood or affect otherwise areas which support conservation worthy terrestrial or aquatic ecosystems, flora or fauna	□	□	□
	6. Flood or affect otherwise areas which will effect the livelihoods of local people (e.g. affect local industry, agriculture, livestock or fish stocks	□	□	□
	7. Involve siting sanitation treatment facilities close to human settlements	□	□	□
	8. Affect water sources (including transboundary aquifers)	□	□	□
	9. Affect sites of historical or cultural importance	□	□	□
	10. Cause the spread of diseases due to lack of sanitation services, the creation of stagnant water pools, pollution caused by the delivery	□	□	□
Environmental Impacts	11. Cause a noticeable permanent or seasonal reduction in the volume of ground or surface water supply	□	□	□
	12. Present a significant pollution risk through liquid, solid or gaseous wastes to humans, sources of water extraction, conservation worthy aquatic ecosystems and species, or commercial fish stocks	□	□	□
	13. Change the local hydrology of surface water-bodies, such that conversation-worthy or commercially significant fish stocks are affected	□	□	□
Mitigating measures	14. Induce secondary development, e.g. along access roads, or in the form of entrepreneurial services for construction and operational activities	□	□	□
	15. Be likely to require mitigating measures that result in the project being financially or socially unacceptable			

Comments		
	I recommend that the subproject will have no significant adverse environmental impacts.	□
	I recommend that the subproject may have significant adverse environmental impacts and requires further analysis.	□
	All the required mitigating measures have been included within the design and the contract conditions for the construction and operation phase.	□
	Name and signature of PWP engineer	date
	Name and signature of environmental specialist	date

5- ESIA Screening Checklist for Schools

Project Name .....
Project ID .....

Aspects of ESIA	Checklist questions Will the new school building:	Yes	No	Additional data needed
Sources of Impact	1. be an extension of an existing one	☐	☐	☐
	2. raise land ownership problems	☐	☐	☐
	3. be close to a main road (attach copy of map of proposed location)	☐	☐	☐
	4. be close to a flood passage	☐	☐	☐
	5. improve the health and education conditions for the students	☐	☐	☐
	6. enhance the female enrollment in the school	☐	☐	☐
Receptors of Impact	7. affect water sources	☐	☐	☐
	8. affect sites of historical or cultural importance	☐	☐	☐
	9. affect the life of surrounding human settlements	☐	☐	☐
	10. affect agricultural land or the life of plants or animals of special importance	☐	☐	☐
	11. require the building of toilets	☐	☐	☐
	12. be the source of unpleasant odors, disease transmission due to the improper use or disposal of wastewater from toilets	☐	☐	☐
	13. during construction, present a significant pollution hazard to workers and local communities	☐	☐	☐
Environmental Impacts	14. once operational, present a significant pollution risk to potable water supplies	☐	☐	☐
	15. not disturb the social structure of the surroundings	☐	☐	☐
Mitigating measures	16. be likely to require mitigating measures that result in the project being financially or socially unacceptable	☐	☐	☐
Comments	**I recommend that the subproject will have no significant adverse environmental impacts.**			☐
	I recommend that the subproject may have significant adverse environmental impacts and requires further analysis.			☐
	All the required mitigating measures have been included within the design and the contract conditions for the construction and operation phase.			
	Name and signature of PWP engineer	date		
	Name and signature of environmental specialist	date		

APPENDIX C: Inspection Checklist for Construction Phase

1. General

- Are required regulations generally being met and maintained?
- Are construction personnel, equipment and materials operating only within the defined work area?
- Are garbage and other wastes regularly collected from the work area and disposed of properly?
- Are vehicles using the approved access routes to the proposed alignment?
- Are all necessary utilities approvals, diversion plans and traffic management plans in place?

2. Access Roads

- Are access roads properly demarcated?
- Are access roads properly located?
- Are access points to public rights of way appropriately controlled?
- Does run off from access roads show evidence of hydrocarbon spillage?
- Is run off from access roads causing stagnant water ponds elsewhere?

3. Camps

- Are camps located correctly?
- Are camps secure?
- Are all fuel stores etc. placed on appropriately sized hard stands?
- Are fuelling and maintenance of equipment conducted at defined sites?
- Are proper records being kept of the volume of waste being generated?
- Are HAZOPS procedures in place and is staff aware of procedures?
- Is equipment washing procedures being observed?

4. Spoil Heaps, Aggregates etc.

- Are spoil heaps of an appropriate size?
- Are materials separated correctly?
- Is there evidence of excessive wind blowing off material?
- Is there evidence of turbid waters running off heaps?

5. Trench Works

- Are trench sides properly buttressed?
- Are access points to trenches appropriate?
- Is cut material placed away from sides of trench?
- Is topsoil being salvaged and placed as specified in contract specifications?
- Are men in trenches properly equipped and protected?
- Is excavated material placed in discrete piles?

- Have any objects of cultural heritage or historical value been encountered during excavation and have the chance find procedures included in the contract been properly and timely followed?

6. Backfill

- Are soil and topsoil properly replaced without mixing?
- Is backfill appropriately compressed?

7. Processing Sites

- Are sites correctly located to minimize adverse atmospheric and noise pollution effects?
- Are sites secure?
- Are all fuel stores etc. placed on appropriately sized hard stands?
- Are fuelling and maintenance of equipment conducted at defined sites?
- Are HAZOPS procedures in place and is staff aware of procedures?
- Are equipment washing procedures being observed?
- Is there evidence of excessive wind blowing off material?
- Is there evidence of turbid waters running off heaps?
- Are materials stored appropriately, (e.g. Bitumen)?

8. Clean-up

- Is the final clean up appropriately timed?
- Has all man-made debris been removed?
- Have all trenches been restored to as close as practicable to original configurations?
- Has access to all areas been restored?

3.8. Project #X (XX - X/X – XX-X-XXXX)

Sub-Project Title Here

The site of this project was visited

1. **Existing situation**:
2. **Available cadre:**
3. **Common diseases:**
4. **Currently available water resources:**
5. **Existing sanitation conditions:**
6. **The content of this project:**
7. **Served area:**
8. **Technical Recommendations to guide Sub-Project Implementation:**
9. **Participation from the people:**
10. **Screening form results:**
11. **Expected Impact from the project and the management plan and monitoring:**
12. **Overall Recommendations , Actions to be Taken, and Parties Resonsible for taking each Action:**

    Commitment from the Ministry:

13. **Follow-up Actions to taken by PWP:**

APPENDIX E: TOR for Social Mobilization and Environmental Awareness Specialist

PUBLICWORKSPROJECTLIPWP-AF

Background:

One of the main objectives of the Public Works Project is to improve access to basic infrastructure services, environmental conditions and sustainability of development projects. To achieve this, the PWP has embedded in its procedures social mobilization and environmental awareness.

Social Mobilization is an important step in achieving sustainable development especially when resources are scarce.

It has been proved that development projects can fail drastically if communities are not involved in the decision process; it is the corner stone for the success of implementation and sustainability of projects.

In this respect communities can play an important role in sustaining the project both operationally and environmentally. They can mobilize resources for operation and maintenance, and if environmental awareness is raised in a proper manner, they can maintain sound environmental conditions.

In the case of small development projects where local communities are the direct beneficiaries the need for their involvement is even more critical.

Thus community involvement is one of the development objectives of the World Bank and international donors.

Objective:

- Social Mobilization to ensure that communities are fully aware of the environmental consequences of implementing the specific project in addition to operation & maintenance aspects.
- Ensure that implemented projects improve the environmental conditions of the communities and are sustainable.
- Improve environmental awareness among all stakeholders, especially local communities.

Responsibilities:

The specialist's responsibilities will be two-fold:

1. Social Mobilization:

1.1 Establishing procedures and Data base

Establishing and improving procedures/methodologies and a database for ensuring in-depth Social Mobilization and contribution in the Public Works Project so as to achieve sustainability.

The procedures should include:

Supervising the establishment of beneficiary committees and election of their members before commencing implementation.

Responsibilities will include but not be limited to:

- Ensure sustainability of completed projects, operationally and environmentally,
- Collect or make available contributions,
- Be present during site handing over,
- Coordinate with concerned agencies if special designs are needed e.g. water, sanitation etc.,
- Be familiar and consent to designs,
- Follow-up with concerned agencies for operation, and
- Ensure operation and maintenance of completed facilities.

Local Councils should be part of the committee and act as facilitator.

Coordination with each community, to ensure that it is well represented and involved in all phases of the project cycle as follows:

- In identifying and prioritising needs. All sub-projects selected, should satisfy the needs and priorities expressed by the communities.
- In preparation and designing, contribute to the design to the most possible extent. Communities should be fully aware of the detailed design through discussions and their consent should be taken. This is of particular importance in water and sanitation projects.
- Implementation by involving the community in site selection, handing over of site, and informal supervision.
- Operation and Maintenance. The most important role of the communities is in ensuring the sustainability of the sub-projects. This should be achieved through the elected committee, by coordination with the relevant agencies and / or operating and maintaining themselves.
- The beneficiary committee should be fully trained in all aspects of O & M, with emphasis on the financial, technical and environmental aspects.

Monitoring their performance during and after implementation for a period of not less than one year after Final Handing over of the Projects.

1.2 Mobilizing Community Contributions in cash and / or in kind.

As one of the PWP's main selection criteria which is also a Rejection Criteria, community contributions i.e. sub-projects with a contribution of less than 5% of the cost are rejected; the specialist will assist sub-area managers in:

- Identify best type of contribution –cash or material;
- If cash –determine amounts, methodology for collection
- If material quantities required, to be in accordance with specifications,
- All contributions should be available before process of tendering,

2. Environmental Awareness:

2.1 Screen environmentally sensitive projects

- Ensure that sanitation measures have been taken before implementing a water supply project.
- Standardize mitigation to the most possible extent (due to the repetitive nature of projects) to be included in designs
- Ensure screening checklists are done. For projects that need further analysis, coordinate and provide necessary information to environmental consultant to undertake ESIA's.
- Ensure all mitigation measures are taken into account during the relevant phases.
- Monitor the EMP and follow- up PWP's responsibilities if any.
- Monitor environmental conditions of completed projects especially water and sanitation and suggest any actions that may be required to improve conditions.

2.2 Training Program / Awareness for Local Communities:

- Prepare an Environmental Awareness training program and training manuals for PWP projects (in particular Water Supply and Sanitation). The awareness should include informing the communities of all environmental factors affecting them due to project implementation.
- Direct supervision of team (which will include female trainers) to train communities on all aspects of environmental issues.
- Prepare and supervise training program for operation and maintenance of water and sanitation projects implemented by the PWP including financial and technical aspects.
- Prepare environmental awareness materials containing messages appropriate for different types of projects.
- Conduct training for local communities and NGOs using specially prepared training manuals and materials to carry out environmental campaigns.
- Monitor the environmental campaigns carried out by local NGOs by following the performance of previously prepared indicators.

3. Reporting:

- All of the above procedures will be reported in an appropriate reporting format per project.
- Quarterly progress reports will be submitted
- All activities on site will be in coordination with the sub-area managers.

APPENDIX F: Social Mobilization

وحدة المشاركةالاجتماعية والتوعيةالبيئية:

(١) مهام مسئول تكوين الجمعيات الخيرية للمياه والصرف الصحي:

-تحمل مسئولية مرافقة الفريق النسائي في جميع تنقلاتهم ووضع الخطة المصغرة لدور كل عضو في المجموعة على مستوى العمل اليومي لهم، هذا بالإضافة إلى المساعدة في وضع المقترح الخاص بتنفيذ البرنامج في مواقع المشاريع (المنفذة والجاري تنفيذها ضمن منطقة محددة من قبل مشروع الأشغال العامة)

-ترتيب موضوع تشكيل الجمعيات الخيرية للمياه والصرف الصحي مع الجهات ذات العلاقة (المجالس المحلية ومد راء المديريات والمحافظون ومسئول وزارة الشئون الاجتماعية بالمنطقة)، ويتم ذلك بالتنسيق مع مدير المنطقة ومهندس المشروع للمنطقة.

-ترتيب موضوع إنتخاب أعضاء الهيئة الإدارية في الجمعيات الخيرية، بحضور مسئول وزارة الشئون الاجتماعية بالمنطقة.

-العمل على وضع وتنفيذ برنامج تدريبي لأعضاء الهيئة الإدارية في الجمعية فيما يخص مهامهم خلال وبعد إنتهاء الأعمال التنفيذية للمشروع ويشمل هذاالبرنامج:

.تدريب المسئول المالي عن كيفية القيام بالعمل المحاسبي المبسط للدخل العائد للمشروع وكذلك ما يخص عمليات الإنفاق (يمكن أن يتم الاستعانة ببعض الأخوة المختصين في عقد ورشة تدريب لمجموعة من المتدربين مع بعض)

تدريب المشغل للمشروع فنيًا عن كيفية التشغيل والصيانة للمشاريع التي يكون فيها التشغيل بواسطة مضخة (يعتمد هذا على نوع المشروع وعلى الأمور الفنية التي يحتويها، حيث يتم الاستعانة ببعض الفنيين والمختصين في عملية التدريب هذه)

-المشاركة في تنفيذ البرنامج الخاص بالتوعية والإرشاد مع باقي أعضاء الفريق فيما يخص توعية الرجال في الجانب الصحي، وكذلك فيما يخص الإصحاح البيئي وهذا يتم للمشاريع الجديدة وللمشاريع القديمة التي هي بحاجة لمثل هذا النشاط بناء على نتائج استمارات التقييم التي تم إعدادها من قبل بعض مهندسي المناطق.

-في حالة أن يكون المشروع المراد تنفيذه للمنطقة هو مشروع صرف صحي فلا بد من شرح ما يسمى بخطة إدارة البيئة وتحويرها بما يناسب وضع المشروع في المنطقة المراد تنفيذ المشروع فيها.

-إعداد تقرير شامل (مع باقي أعضاء الفريق) لمجمل النشاطات التي تتم في المجالين التدريبي والإرشادي وتعزيز ذلك بالصور الفوتوغرافية، وتوضيح ما يسمى بالأثر البيئي على المنطقة من جراء عمل المشروع في حالة تنفيذه، وكذلك توضيح هذا الأثر للمشاريع التي سبق تنفيذها من خلال رؤية ذلك على الطبيعة ويتم ذلك بالاستعانة بالنماذج الموجودة في المشروع وكذلك استمارة المسح القاعدي لحالة ما قبل المشروع وحالة ما بعد المشروع، والخروج بتصور الحلول المناسبة لتحسين هذه الأوضاع البيئية في المنطقة.

-العمل مع جميع العاملين في وحدة المشاركة الاجتماعية والتوعية البيئية في وضع تصور للمنهجية الثابتة والتي يجب أن يعتمدها مشروع الأشغال العامة في مشاريع المياه والصرف الصحي باختلاف أنواعها مع الأخذ في الاعتبار أن هذه المشاريع تنفذ عن طريق المقاولات، وأن المساهمات المحلية تختلف من مشروع لآخر.

(٢) مهام المرشدة الاجتماعية :

عمل المسوحات الاقتصادية والاجتماعية بطريقة PRA لمنطقة المشروع الذي سيتم أو يتم تنفيذه مع باقي أعضاءالفريق

-عقد ورشة تدريب النساء في مجال التوعية الصحية والبيئية (الاستخدام الأمثل لمياه الشرب في المنازل وتناول جميع الآثار الصحية والبيئية المصاحبة ، برنامج النظافة الشخصية والمدرج تحت عنوان "أيدينا"، الأمراض المتعلقة أساسًا بطريقة استخدام المياه، موضوع تصريف الفضلات وأثر ذلك على البيئة المترلية والأثر على منطقة المشروع بشكل عام.

-عقد ورشة تدريب الرجال في مجال التوعية الصحية والبيئية (الاستخدام الأمثل لمياه الشرب في المنازل وتناول جميع الآثار الصحية والبيئية المصاحبة، برنامج النظافة الشخصية والدرج تحت موضوع "أيدينا"، الأمراض المتعلقة أساسًا بطريقة استخدام المياه، موضوع تصريف الفضلات وأثرذلك على البيئة المترلية والأثر على منطقة المشروع بشكل عام) .
اختيار وتكليف المروجين المحليين من الرجال والنساء في البدء بتأدية عملهم في مجال التوعية البيئية والصحية للمنطقة بالتنسيق مع الأخوة أعضاء الجمعية الخيرية للمياه والصرف الصحي بالمنطقة.
-عمل تطبيق ميداني للمروجين المحليين (رجال ونساء)، وذلك بالإشراف عليهم (مع باقي أعضاء الفريق) من خلال الزيارات الميدانية ومراقبة هؤلاء المروجين وكتابة الملاحظات وتوضيح نقاط الضعف والقوة لهم لتحسين الأداء.
-بالنسبة للمشاريع المنفذة من السابق فإنه يتم تعبئة الاستمارات التي تقيم الوضع الراهن للمشروع (وهذا يخص تلك المشاريع التي لم تعبأ استماراتها بعد) وماهي المقترحات والتوصيات لتحسين الوضع البيئي والصحي له.
-إعداد تقرير شامل (مع باقي أعضاء الفريق) لمجمل النشاطات التي تتم في المجالين التدريبي والإرشادي وتعزيز ذلك بالصور الفوتوغرافية، وتوضيح الأثر البيئي على المنطقة من جراء عمل المشروع في حالة تنفيذه، وكذلك توضيح هذا الأثر للمشاريع التي سبق تنفيذها من خلال رؤية ذلك على الطبيعة ويتم ذلك بالاستعانة بالنماذج الموجودة في المشروع وكذلك استمارة المسح القاعدي لحالة ما قبل المشروع وحالة ما بعد المشروع، والخروج بتصور للحلول المناسبة لتحسين هذه الأوضاع البيئية في المنطقة.
-العمل مع جميع العاملين في وحدة المشاركة الاجتماعية والتوعية البيئية في وضع تصور للمنهجية الثابتة بما في ذلك التوعية البيئية والتي يجب أن يعتمدها مشروع الأشغال العامة في مشاريع المياه والصرف الصحي باختلاف أنواعها مع الأخذ في الاعتبار أن هذه المشاريع تنفذ عن طريق المقاولات، وأن المساهمات المحلية تختلف من مشروع لآخر.

Environment

Institutional Arrangements and Documentation

1. Has the project been identified to have negative environmental impacts? Yes_____ No _____

If "Yes", does the contractor include an environmental specialist / site engineer? Yes_____ No _____

2. Does the contractor have a copy of the Environmental Management Plan (EMP), ESMP?
Yes_____ No _____

If "Yes", is environmental compliance being monitored and reported in consultant reports?
Yes_____ No _____

3. Is the project causing negative environmental impact or nuisance? (e.g. to flora, fauna or relating to noise, dust, waste, etc.)

Comment:

If "Yes", are mitigation measures as recommended in the EMP being implemented?
Yes_____ No _____

4. Does Project Management Unit (PMU) include environmental staff or consultant? Yes_____ No _____

If "Yes", is the above individual trained on EMP and World Bank safeguard policies?
Yes_____ No_____

5. Does the PMU include a Monitoring and Evaluation (M&E) specialist? Yes_____ No _____

6. Is information relating to environmental compliance included (separate annex or paragraphs) in Project Progress Reports? Yes_____ No _____

Disposal, Contamination and Erosion

7. Does the project require large amounts of raw material and construction material to be transported (e.g. from a quarry)? Yes_____ No _____

8. Does the contractor have written permission from relevant authorities for selection of quarry site?
Yes_____ No _____

9. Is the project obtaining sand or gravel from river bed or alternative source other than identified quarry?
Yes_____ No_____

10. Does the project require cutting down of trees or other vegetation? Yes_____ No _____

11. Is the project causing degradation to natural areas? Yes_____ No _____

12. Is the project generating large amounts of residual wastes (solid/liquid waste)? Yes_____ No _____

13. Is the project causing soil or water contamination? (e.g. from oil, grease, fuel, equipment)
Yes____ No____

14. Is the project using herbicides and chemicals thereby causing soil and water contamination?
Yes____ No____

15. Is the project generating hazardous waste substances? Yes_____ No _____

If "Yes", are these being disposed in pre-identified and approved sites? Yes_____ No _____

16. Is the project causing any cumulative negative environmental impacts or unanticipated negative environmental impacts beyond the footprint of the project? Yes____ No____

Comment:

Community, Health and Safety

17. Are there any community concerns/complaints relating to negative environmental impacts?

If "Yes", are they being addressed? Yes_____ No _____

18. Are on site workers equipped with PPE? Yes_____ No_____

19. Does the contractor have adequate medical emergency supplies (first aid kit) on site?
Yes_____ No _____

20. Is the project is causing sanitation related environmental issues (also stagnant water)?
Yes_____ No _____

If "Yes", are mitigation measures being applied? Yes_____ No _____

safeguards Social

Sample Screening Form for Social Safeguards Monitoring

A. <u>Social & Safeguards Indicators</u>

1. Was land required for the project construction? Yes: __ No:_____

2. If the answer to above is "Yes", specify the amount of land/assets acquired for the project activities (in local unit of measurement) and where it was acquired from and if it was required voluntarily or involuntarily:

Source	Amount	Voluntary	Involuntary
a. Government			
b. Common/Community land			
c. Private			

3(a) Compensation for the Project Affected People (PAP):

- Has any compensation been paid to the affected families, for the loss of structure and other productive income, e.g. fruit trees, agg land?: Yes or No
- If yes, how was compensation paid?
  (i) in cash:_____, (ii) in kind (e.g. land for land): _____
- The amount of compensation paid per unit: (i)Land: _____/ (ii) tree: _____/unit; and (iii) structure/wall:_____/room/running meter
- The source of compensation (in percentage): (i)Government: _____, (ii) community compensation: _____, (iii) private donation: _____
  Comments:

3. Were the PAPs and beneficiaries/community satisfied with the approach of acquiring land/assets (including the amount of compensation)? Yes_____ No_____
4. If not, why? _____
5. Is there documentation available regarding the land acquisition (size, location and ownership)? Yes:____ No:____
6. If yes, please specify where it is located and attach a copy to the report.
7. Were consultations held with the community during the planning and implementation phase of this project? Yes_____ No____
8. If yes, are documentation of consultation available?
9. Were community women involved in the project related consultations? Yes:_____ No:____
10. If Yes – are documentation of consultations available? Yes_____ No:_____
11. Were females consulted regarding the planning and implementation of the project? Yes:_____ No:_____ Comments_____
12. What concerns regarding the project were raised by women? Comments:_____
13. Is there any documentation of the main concerns raised by women voiced: Yes_____ No_____
14. Where is the documentation located?_____

Grievance redress mechanism

1. Is a grievance handling system to address local conflict regarding the project? Yes:_____ No: _____
   If Yes, please answer below questions:
   a. Most frequent type of grievance: _____
   b. Where are grievances registered and who handles them? _____