

Major Issues on Environmental and Social Considerations

1. Information Source for Environmental and Social Considerations of the Project

- 1.1. Japan International Cooperation Agency (hereinafter referred to as the "JICA") reviewed the Environmental and Social Considerations of the Project for Atari Irrigation System (hereinafter referred to as "the Project") based on the following documents:
 - i. Feasibility Survey on "the Project on Irrigation Scheme Development in Central and Eastern Uganda 2014-2016" (hereinafter referred to as "the F/S"),
 - ii. Environmental Impact Assessment (hereinafter referred to as "the EIA") report for the Project approved August 2017.
 - iii. Resettlement Action Plan for the Project (hereinafter referred to as "the RAP")
 - iv. Draft Final Report for the Project (hereinafter referred to as 'the Draft Report).

2. Environmental and Social Guidelines and Category

- 2.1. JICA explained that the "JICA Guidelines for Environmental and Social Considerations" (April 2010) (hereinafter referred to as "the JICA Guidelines") is applied to the Project. The Project is classified as Category A due to its characteristics (located in a sensitive area) under the JICA Guidelines.
- 2.2. Ministry of Agriculture, Animal Industry and Fisheries (hereinafter referred to as "MAAIF"), Executing Agency of the Project, assured JICA that the Project will apply the JICA Guidelines and follow the World Bank Operational Policies 4.12 for involuntary resettlement and land acquisition activities.
- 2.3. MAAIF confirmed that appropriate Environmental and Social Considerations in compliance with laws and regulations and /or policies of the Government of Uganda as well as the JICA Guidelines shall be ensured.

3. Approval of the EIA Report

- 3.1. The EIA was approved by National Environmental Management Authority (hereinafter referred to as "NEMA") on 2nd August 2017. MAAIF assured that it will take necessary measures to address all conditions specified in the approval letter by NEMA (see the Attachment 1).

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4. Consideration of Alternatives

- 4.1. MAAIF explained that the Project area was selected from a viewpoint of physical feasibility and minimization of environmental and social impacts, including impacts on biodiversity, resettlement and land acquisition.

5. Stakeholder Meetings on the Project

- 5.1. MAAIF explained that 4 times of stakeholder meetings with attendance of Project Affected Persons (hereinafter referred to as "PAPs"), representatives of national and local governments, district councils, and NGOs were held in March, 2016, May, 2016, February, 2018 and June, 2018. At these meetings, MAAIF explained the stakeholders about the outline of the Project, the EIA report and the RAP, referring to the potential impacts from the Project. Initially, some stakeholders expressed their concerns over restriction on land use rights, compensation for land acquisition as well as loss of income opportunities during the construction. At the last stakeholder meeting held on June 2018, most of PAPs did not show their concerns over the information shared and they were eager to know the time of commencement of the Project that would significantly contribute to improving their living standard.
 - 5.2. In addition, MAAIF confirmed that appropriate considerations (e.g., provision of equal opportunities for expressing opinions) were given to the vulnerable people including people including female household heads, poor and elderly (hereinafter referred to as "the vulnerable").
- #### 6. Required Environmental and Social Permits
- 6.1. MAAIF ensured that necessary permits for the Project including water use permit and construction permit will be obtained adequately before the construction.
 - 6.2. MAAIF agreed that appropriate technical guidance and support for the use of agrochemicals as well as chemical fertilizers shall be provided to farmers in the Project areas before the construction so as to adequately address one of the conditions of specified in the approval letter of the EIA report.

7. Disclosure of the EIA and the RAP

- 7.1. MAAIF agreed that F/S, the EIA report, and Certificate of the EIA report will be disclosed on JICA web site. Both sides confirmed that the RAP will be disclosed without personal information likewise by the end of August 2018.
- 7.2. JICA explained that the EIA report and the RAP shall be available to the local residents of the country in which the Project is to be implemented in accordance with the JICA Guidelines. MAAIF assured that those two

documents will be available at all times for perusal to the Project stakeholders and photocopying will be permitted.

- 7.3. MAAIF explained that the EIA report was already disclosed and the RAP will be disclosed on the website of MAAIF by August 2018. Disclosure of the EIA and the RAP will be informed at stakeholder consultation meetings by MAAIF. In addition, the Final Report for the Project will be disclosed by August 2018.
- 7.4. MAAIF confirmed that necessary assistance including translation was provided for people who do not understand English and/or had difficulties in finding relevant information at all stakeholder meetings so that all stakeholders could understand the discussions.

8. Disclosure of the Results of Monitoring regarding Environment Management, Land Acquisition/Involuntary Resettlement

- 8.1. JICA and MAAIF confirmed that according to the JICA Guidelines, JICA discloses the results of monitoring on its website to the extent that they are made public in the country where the Project is implemented.
- 8.2. MAAIF confirmed that the monitoring results regarding the Environmental Management Plan (hereinafter referred to as "EMP") and the RAP will be disclosed on MAAIF website and District offices.
- 8.3. MAAIF agreed to submit the environmental and social monitoring report quarterly during construction stage and semi-annually during operation stage for three years, using the monitoring forms as Attachment 4 and 6.
- 8.4. JICA and MAAIF agreed that the results of monitoring will be disclosed on JICA website upon approval by the project proponents.
- 8.5. JICA explained that MAAIF is encouraged to make results of the monitoring process available to the stakeholders in accordance with JICA Guidelines.

9. Environmental Management Plan (EMP)

- 9.1. MAAIF confirmed that MAAIF will take necessary measures to mitigate the environmental and social impacts caused by the Project and to prevent deterioration of the existing environmental condition in accordance with EMP. JICA and MAAIF agreed to EMP as Attachment 3.
- 9.2. To reflect requirements of Agrochemical Management Plan (the details are described in the section of 14.2), MAAIF in conjunction with the Consultant of the Project will review, revise and update EMP during the Detailed Design stage, and will submit the revised EMP to JICA before the construction.
- 9.3. MAAIF agreed to secure sufficient budget to implement EMP and Environmental Monitoring Plan (hereinafter referred to as "EMoP").

10. Environmental Monitoring Plan (EMoP)

- 10.1. MAAIF confirmed that environmental monitoring shall be conducted under the responsibility of MAAIF and in accordance with EMoP as Attachment 3. Specifically, during the construction period, the Contractor, under the supervision of MAAIF will conduct the environmental monitoring. After the 3 years of the completion of the construction, MAAIF will conduct the environmental monitoring with technical supports from Ministry of Water and Environment (hereinafter referred to as "MWE") as well as relevant local officers including regional environmental officer, regional wetland officer, and district environmental officer to properly assess potential risks and impacts on water, soil and birds.
- 10.2. JICA and MAAIF agreed that the results will be submitted to JICA as part of the Progress Status Report by filling in the Environmental Monitoring Form as Attachment 4.
- 10.3. In case the results of monitoring contravene Uganda or international standards, and/or significant adverse impact is identified, necessary actions will promptly be taken under the responsibility of MAAIF.
- 10.4. To reflect requirements of Agrochemical Management Plan, MAAIF in conjunction with the Consultant of the Project will review, revise and update EMoP during the Detailed Design stage and will submit the revised EMoP to JICA before the construction.
- 10.5. MAAIF agreed to submit the results of environmental and social monitoring to JICA quarterly during construction, and semi-annually until three years after the completion of the Project, by filling in the monitoring form as Attachment 4 and 6.
- 10.6. The period of environmental monitoring may be extended if any significant negative impacts on the environment or society are observed. The extension of the environmental monitoring, until JICA confirms the issues have been properly addressed, will be decided based on an agreement between MAAIF and JICA.
- 10.7. JICA and MAAIF confirmed the importance to collect technical guidance and advice from professional ornithologists in determining the methodology for monitoring of potential impacts on the 4 endangered species observed in the Project area and Lake Opeta located in the downstream of the Project area during Detailed Design stage.
- 10.8. MAAIF agreed to conduct monitoring of socio-economic impacts as well as grievances in the RAP implementation stage, construction stage and operation stage with a special consideration for the vulnerable.

11. Organizational Framework for Implementation of EMP and EMoP

- 11.1. MAAIF explained that MAAIF with technical supports from MWE as well as relevant local officers including regional environmental officer, regional wetland officer, and district environmental officer will take all responsibilities of the overall implementation of EMP and EMoP. Specifically, during the construction period, the Contractor, under the supervision of MAAIF will conduct the environmental monitoring. After the 3 years of the completion of the construction stage, MAAIF will conduct

the environmental monitoring. MAAIF ensured that MAAIF will assign an environmental officer supervising all implementation process of EMP and EMoP of the Project

12. Cost and Schedule for Implementation of EMP and EMoP

12.1. JICA and MAAIF confirmed that the cost for the implementation of EMP and EMoP is included in the undertakings of the Government of Uganda and their schedule is clearly specified in EMP and EMoP. The details are described in Attachment 3.

13. Bidding Document

13.1. The MAAIF assured to insert an environmental and social considerations section (e.g., consisting of the main contents of EMP and EMoP, frequency of reporting, regulatory compliance/approval, etc.) into the Bidding Documents of the Contractor.

14. Other Significant Environmental and Social Issues

14.1 MAAIF confirmed that Lake Opeta, designated as the Ramsar Site as well as the important bird and biodiversity area, is located 800m downstream from the Project area. The lake is inhabited by the endangered bird species such as the Fox's Weaver (*Ploceus spekeoides*) and the Shoebill (*Balaeniceps rex*). In addition, MAAIF confirmed the existence of the endangered Gray-crowned Crane (*Balearia regulorum*) and Pallid Harrier (*Circus macrourus*) in the Project area.

	Name	Scientific Name	IUCN Category
Lake Opeta	Fox's Weaver	<i>Ploceus spekeoides</i>	Near Threatened
	Shoebill	<i>Balaeniceps rex</i>	Vulnerable
Project Target Area	Gray-crowned Crane	<i>Balearia regulorum</i>	Endangered
	Pallid Harrier	<i>Circus macrourus</i>	Near Threatened

14.2 MAAIF agreed to develop an Agrochemical Management Plan which includes guidelines, manuals and training programs for proper use of pesticides, herbicides and chemical fertilizers with technical support from JICA before the construction. MAAIF agreed to establish a practical mechanism for the implementation of Agrochemical Management Plan with its budget and competent staff (e.g., Department of Crop Inspection

mechanism for the implementation of Agrochemical Management Plan with its budget and competent staff (e.g., Department of Crop Inspection and Certification, Directorate of Crop Resources) and will conduct the technical trainings during the construction supported by the Consultant.

14.3 MAAIF agreed to conduct monitoring of the impacts of agrochemicals on soil and water quality referring to the international standards (e.g., the European Union) using a monitoring sheet as Attachment 4.

14.4 During the construction stage, MAAIF will use the Contractor for the monitoring with technical supports from National and Regional Laboratory under the Directorate of Water Resources Management of MWE as well as relevant local officers including regional environmental officer, regional wetland officer, and district environmental officer.

14.5 For the purpose of minimizing negative impacts on the surrounding ecosystems, MAAIF agreed to conduct monitoring of the 4 endangered bird species (identified in 14.1) observed in the Project area and the Lake Opeta (Ramsar Site) in the downstream during both construction and operation stages. In case a significant reduction of the population was observed through the monitoring, MAAIF will take appropriate mitigation measures in collaboration with National and Regional Laboratory under the Directorate of Water Resources Management of MWE as well as relevant local officers including regional environmental officer, regional wetland officer, and district environmental officer.

14.6 MAAIF ensured that there is sufficient capacity of existing disposal sites with official approval for waste soils during construction stage. MAAIF assured that all waste soil will be disposed in a legal and appropriate manner at officially approved disposal sites.

14.7 MAAIF agreed to set up a river maintenance flow at the headworks of the irrigation facility in order to maintain the adequate amount of river water.

15. Scope of the Resettlement and Land Acquisition of Assets

15.1. MAAIF explained that 488 households will be affected due to the Project.
15.2. MAAIF explained that the number of households, businesses, community structures, trees, and crops which will be resettled by the Project are described as follows.

**Resettlement by the Project
Project Affected Households (PAHs)**

Total Project Affected Households (PAHs)	488 HHs	Legal: 488 HHs Illegal: 0 HH
PAHs which need to be resettled (as resident)	1 HHs	Legal: 1 HHs Illegal: 0 HH
PAHs which do not need relocation (relocation of non-resident structures)	485 HHs	Legal: 485 HHs Illegal: 0HH
Business owners who need relocation	1 person	Private school fence
Business owners who do not need relocation	1 persons	

Structures and Improvements

District	Sub-county	Parish	Village	Structure Type	No. of Affected Structures
Bulambuli	Bunambutye	Buwebele	Bunambale	Temporarily Commercial House: Roof: Galvanized Corrugated Iron sheet (GCI) on local poles Ceiling: Nil Walls: Mud and wattle Doors: Timber Windows: Timber Floor: Earth Condition: Fair	1
				Shade for Commercial 1: Roof: Grass thatched Walls: Wooden poles supporting Doors: Nil Windows: Nil Floor: Earth Condition: Fair	1
				Shade for Commercial 2: Roof: Grass Thatched Walls: Woodend poles supporting Doors: Nil Windows: Nil Floor: Earth Condition: Fair	1
				Temporarily Store House: Roof: Grass thatched Ceiling: Nil Walls: Mud and wattle Doors: Timber Windows: Nil Floor: Earth Condition Fair	1
				Temporarily Kitchen: Roof: Grass thatched Ceiling: Nil Walls: Mud and wattle	1

District	Sub-county	Parish	Village	Structure Type	No. of Affected Structures	
Kween	Ngenge	Sikwa	Amukokel	Doors: Timber Windows: Nil Floor: Earth Condition Fair Pit latrine 1: Roof: Grass thatched Walls: Mud and wattle Doors: Nil Floor: Earth Condition Fair	1	
				Pit latrine 2: Roof: Grass thatched Walls: Mud and wattle Doors: Nil Floor: Earth Condition Fair	1	
				Bathroom: Roof: Nil Walls: Enclosure of grass tied to wooden poles Doors: Nil Windows: Nil Floor: Earth Condition: Fair	1	
				Buwechalo		
				Bukhayaki		
				Sub-total (a)		7
				Temporarily Residential House: Roof: GCI on local poles Ceiling: Nil Walls: Mud and wattle Doors: Battened timber Windows: Nil Floor: Earth Condition: Fair		1
				Temporarily Residential House: Roof: Grass thatched Ceiling: Nil Walls: Mud and wattle with no finish yet Doors: Battened timber Windows: Nil Floor: Earth Condition: Fair		1
				Public structures: School Fence: Barbed wire on local poles		1
				Sikwo		
Soset						
Sub-total (b)		3				
Grand Total (c) = (a) + (b)		10				

Crops and Trees

District	Sub-county	Parish	Village	Crop Name	Perennial/ Annual	No. of Affected Crops
Bulambuli				Avocado	Annual	2
				Mature Mango Trees	Permanent	6
				Banana Clumps	Permanent	221
				Eucalyptus Trees	Permanent	4
				Paw Paws	Annual	1
				Fig Trees	Permanent	1
				Acacia Trees	Permanent	26
				Jack Fruit Trees	Permanent	2
				Orange Trees	Permanent	69
				Bush Trees	Permanent	195
				Banana clumps	Permanent	24
				Bush Trees	Permanent	2
				-	-	-
				-	-	555
Kween			Amukokel	Acacia trees	Annual	90
				Avocado	Permanent	1
				Mature Mango Trees	Permanent	35
				Banana Clumps	Permanent	1,889
				Eucalyptus Trees	Annual	15
				Paw Paws	Permanent	72
				Fig Trees	Permanent	4
				Acacia Trees	Permanent	156
				Jack Fruit Trees	Permanent	1
				Gravari	Permanent	1
				Coffee Trees	Permanent	8
				Bush Trees	Annual	3
				Eucalyptus Trees	Permanent	2
				Fig Trees	Permanent	19
Soset				Banana Clumps	Permanent	22
				Mango trees	Permanent	10
				Bush Trees	Permanent	2
				Acacia Trees	Permanent	4
Sub-total (a)						2,024
Sub-total (b)						2,579
Grand Total (c) = (a) + (b)						2,579

15.3. MAAIF explained that the total amount of land acquisition for the Project is approximately 60 ha (private land) and details are as follows:

Land Acquisitions for the Project

District	Acquired Lands (ha)		Total
	For Irrigation Facilities	For Protected Zone	
Bulambuli	23,939	7,071	31,010
Kween	24,473	4,990	29,463
Total	48,412 (80%)	12,061 (20%)	60,473 (100%)

Total Areas to be Acquired

Total	Details
Total areas: 60 ha	Government: 0 ha Private: 60ha

15.4. MAAIF confirmed that sufficient explanations and opportunities for consultations will be provided for all the farmers who wish to use their lands as a part of the model sites which entails land re-organization activities. The model sites will be 12ha in total (6ha for the two districts respectively). MAAIF explained that the Project Area Coordination Committee (hereinafter referred to as "PACC") will ensure the smooth discussions among the farmers.

15.5. MAAIF agreed to keep record of all the consultations and to obtain a valid signature from all the farmers who will participate in land re-organization activities. MAAIF should submit the record of consultations and signed documents from all the participants before the construction.

16. Cut-off date and prevention of Influx of People into the Project Area

16.1. JICA and MAAIF agreed that the date of the socio-economic survey for the RAP on 20th January 2018 shall be used as the cut-off date for the Project.

16.2. JICA pointed out that encroachment of people into the Project area after the cut-off date may occur if no measures are taken. MAAIF assured that MAAIF will use the original PAPs list before pegging, which is included in the RAP, to check for encroachments.

16.3. JICA and MAAIF agreed that MAAIF will disclose the cut-off date by setting up notice boards in and around the Project area by February 2019 to prevent the influx of people into the Project.

17. Eligibility Criteria

17.1. MAAIF explained that all PAPs will be eligible for the compensation (either in cash or land) and rehabilitation / resettlement assistance, irrespective of tenure status, social or economic standing, or any such factors. All PAPs residing, working, doing business within the Project impacted areas as of the detailed socio-economic survey are entitled to compensation for their lost assets (land and/or non-land assets), at replacement cost, and restoration of incomes and businesses, and will be provided with rehabilitation measures sufficient to assist them to improve or at least maintain their pre-project living standards, income-earning capacity and production levels.

18. Entitlement Matrix

- 18.1. MAAIF explained that all PAPs will be eligible for compensation, rehabilitation/resettlement assistance, and disturbance allowance based on the Entitlement Matrix. JICA and MAAIF agreed to the Entitlement Matrix as Attachment 5.
- 18.2. MAAIF confirmed that all PAPs will equally be treated for the compensation regardless their status of landownership: including legal landowners and customary landowners (65 households) who illegally engage in agriculture inside the buffer zone. The compensation will secure the full replacement cost for their land, structure and assets.
- 18.3. MAAIF assured that all PAPs, including the vulnerable, will be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

19. Replacement Cost and Payment for Lands and Structures

- 19.1. MAAIF explained that compensation costs set out in the RAP are evaluated based on the market value for land according to the Land Act by the Ministry of Lands, Housing, and Urban Development. Although the Act stipulates that the structures are calculated as depreciated replacement cost in the rural areas, MAAIF agreed to provide the compensation without any depreciation nor deduction.
- 19.2. MAAIF agreed to provide appropriate farmland in the Project area as a compensation for the customary landowners in case there is a request, as a substitution of cash payment. In addition, MAAIF agreed to provide support to find out alternative farming land for those who currently cultivating crops and do not own farming land in the buffer zone.

20. Livelihood Restoration of the PAPs

- 20.1. MAAIF agreed to implement appropriate livelihood restoration measures for all PAPs. MAAIF agreed to conduct monitoring of livelihoods and income status of PAPs.
- 20.2. MAAIF agreed to provide necessary support to the vulnerable particularly for those who will have to be physically relocated.
- 20.3. MAAIF ensured that the equal water use right will be provided to all farmers in the Project area.
- 20.4. MAAIF agreed to encourage the Contractor to provide employment opportunities for local residents with a special focus on the vulnerable.

21. Consultation with PAPs

- 21.1. JICA and MAAIF agreed that MAAIF shall provide PAPs with sufficient information on the Project and its resettlement policy including compensation, other assistances, schedule, and grievance redress mechanism. MAAIF assured to continue information disclosure and consultations with PAPs through consultation meetings during implementation of the RAP. MAAIF also confirmed to keep records of the discussion in the consultation meetings, including features (e.g. position and sex) of the participants/speakers, their statements, response from the Project, and measures taken for the vulnerable.
- 21.2. MAAIF explained that 4 stakeholder meetings with the PAPs were held in the areas affected by the Project between March 2016 and June 2018. During these meetings, MAAIF informed the PAPs about the project, the EIA and the RAP, including compensation (based on replacement cost), resettlement assistance, schedule, grievance redress mechanism, and the Project's livelihood restoration measures.

22. Internal Monitoring of the RAP Implementation

- 22.1. JICA and MAAIF agreed that MAAIF will implement the RAP including livelihood restoration measures for PAPs through the RAP implementation consultant.
- 22.2. JICA and MAAIF agreed that internal monitoring of the RAP implementation will be conducted by MAAIF, during the course of the RAP, with necessary assistance by the Consultant. MAAIF assured that the results of the monitoring will be reported to JICA on a quarterly basis as a part of the Project Monitoring Report by the RAP Monitoring Form as Attachment 6 until the completion of land acquisition and physical relocation.
- 22.3. MAAIF agreed to submit the results of the RAP Monitoring to JICA, until one year after the end of the livelihood restoration measures. The period of the RAP monitoring may be extended if economically affected persons' livelihoods are not sufficiently restored. The extension of the internal monitoring of the RAP implementation, until JICA confirms the issues have been properly addressed, will be decided based on an agreement between MAAIF and JICA.

23. Organizational Framework for the RAP Implementation

- 23.1. MAAIF assured that MAAIF takes overall responsibility of updating and implementing the RAP. The RAP Implementation consultant will be hired by MAAIF before construction and will be in charge of the implementation of the RAP.

Actions	Deadline	Responsibility	No.
submit to JICA			
Assign an environmental officer who will supervise the implementation of the EMP and EMoP of the Project	Before Construction	MAAIF	11.1
Request the National and Regional Laboratory of MWE, Regional Environmental Officer, Regional Wetland Officer, and District Environmental Officer to provide technical support for environmental monitoring (i.e. water, soil, and birds)	Before Construction	MAAIF	11.1
Receive advice from a professional ornithologist in determining the methodology for monitoring the potential impacts on the 4 endangered species and submit the meeting record to JICA	Before Construction	MAAIF	14.5
Confirm that the capacity of the existing disposal sites is sufficient and that all the disposal sites are officially approved sites	Before Construction	MAAIF	14.6
Submit the final RAP budget to JICA	July, 2018.	MAAIF	24.3

24. Cost and Budget for the RAP implementation

- 24.1. JICA and MAAIF agreed on 1,384,072,209UGX (according to the calculation prior to the approval of CGV) for the RAP implementation. JICA and MAAIF confirmed that the amount is a preliminary estimate and subject to approval by the Chief Government Valuer.
- 24.2. MAAIF confirmed that the RAP costs will be borne by the Government of Uganda, regardless of changing amount estimated in the RAP.
- 24.3. MAAIF assured that the amount of the final RAP budget will be informed to JICA by July, 2018.
- 24.4. In case there would be changes in the contents of the RAP at the Detailed Design stage, MAAIF should re-submit the revised the RAP to JICA for its review.

Actions to be Taken

JICA stressed the following tasks as key actions for smooth implementation of the Project. MAAIF agreed to take the following actions in a timely manner as stated below.

Actions	Deadline	Responsibility	No.
Obtain necessary permits (water use, construction)	Before construction	MAAIF	6.1
Disclosure of the RAP on MAAIF website and district offices	August 2018	MAAIF	7.1
Submit the minutes of the 4 th stakeholder meeting (held in June 2018) to JICA	August 2018	MAAIF	5.1
Submit the record of consultation meetings with the model farm participants to JICA	Before construction	MAAIF	15.5
Submit the document signed by the model farm participants to JICA	Before construction	MAAIF	15.5
Disclose the cut-off date by a notice board in/around the Project area to prevent the influx of people into the Project target area	February 2019	MAAIF	16.3
Develop Agrochemical Management Plan and submit a revised EMP/ EMoP reflecting the Agrochemical Management Plan to JICA	July 2021	MAAIF, Consultant	10.2
Establish an appropriate mechanism of implementing the Agrochemical Management Plan (including budget, staff, implementation schedule) and	July 2021	MAAIF	14.3


	physical displacement	
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(END)

- Attachment -1 Certificate Approval of the EIA
- Attachement-2 Environmental Checklist
- Attachement-3 EMP and EMoP
- Attachement-4 Environmental Monitoring Form
- Attachement-5 Entitlement Matrix
- Attachement-6 Social Monitoring Form

Original

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 THE REPUBLIC OF UGANDA
THE NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)
 The National Environment Act Cap. 153
 The Environmental Impact Assessment Regulations, S.I. No. 13 of 1998
Certificate of Approval of Environmental Impact Assessment
 Certificate No. NEMA/EIA/ 10475

This is to certify that the Project Brief/Environmental Impact Statement** received from

M/s. MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY & FISHERIES, & MINISTRY OF WATER AND ENVIRONMENT
 of **P.O. BOX 102, ENTEBBE, TEL: +256 414 320004**

submitted in accordance with the National Environment Statute to the National Environment Management Authority (NEMA) regarding

ESIA FOR ATARI RIVER BASIN IRRIGATION SCHEME
 (Title of Project)

briefly described as **ATARI RIVER BASIN IRRIGATION SCHEME**

(Nature, Purpose)

located at **BUNAMBUYE-SUBCOUNTY, BULAMBULI DISTRICT AND NGENCE SUBCOUNTY, KWEEN DISTRICT**

(District/Sub-county/City/Town/Ward)

has been reviewed and was found to:


*** have no significant environmental impacts and**

**** have significant environmental impacts and the following appropriate mitigation measures were identified and made a condition precedent for approval and implementation:**

= PLEASE TURN OVER =

(Attach relevant details with)

Dated at **KAMPALA** **2ND AUGUST, 2017**


 Executive Director (NEMA)

Authority: Quorum/Quorum: Any other relevant agency

** Delete whichever is not applicable









CONDITIONS OF APPROVAL
(Additional Information Sheet)

CONDITIONS OF APPROVAL FOR THE ESIA FOR ATARI RIVER BASIN IRRIGATION SCHEME

In addition to implementing the mitigation measures outlined in the Environmental and Social Impact Assessment, this Certificate of Approval is granted on condition that the Developers, MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND FISHERIES; AND, MINISTRY OF WATER AND ENVIRONMENT, shall comply with the approval conditions stated below:

ADMINISTRATIVE CONDITIONS OF CERTIFICATE

- 1. This Certificate is issued in accordance with the requirements of the National Environment (Environment Impact Assessment) Regulations, SI. No. 153-1 and of the Physical Planning Act, 2010.
- 2. Issuance of this Certificate of Approval is based on the content of information contained in the Environmental and Social Impact Assessment as submitted by the Developer.
- 3. The Developer shall be held responsible for any omissions, falsified information or any other anomalies that are contrary to the provisions stipulated in the relevant laws governing the proposed project.
- 4. This Certificate of Approval is VALID for a period of 20 YEARS - the period that covers both the construction and operational phases of the project.
- 5. The project must commence within the first 24 months (from

Dated at KAMPALA on 2ND AUGUST, 2017 3x

Signed

[Signature]

Executive Director (NEMA)



[Handwritten mark]



NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

CONDITIONS OF APPROVAL FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT PERTAINING TO ATARI RIVER BASIN IRRIGATION SCHEME, IN BUNAMBYE SUB-COUNTY, BULAMBULI DISTRICT AND NGENGE SUB-COUNTY, KWEEN DISTRICT (GPS COORDINATES: Latitude 1° 43' North and 1° 30' South and Longitude 34° 27' East and 34° 27' East)

ADMINISTRATIVE CONDITIONS OF CERTIFICATE (Cont.d)

the date of approval) of the validity period, failure of which the Certificate may be varied, cancelled or otherwise dealt with by this Authority.

- 6. The Executive Director should be NOTIFIED of any transfer of ownership, variation/alteration of the project design or components, or surrender of this Certificate of Approval.

1.0 SPECIFIC CONDITIONS OF APPROVAL

- (i) Restrict project activities to the area shown in Figure 1, and ensure that project affected persons are compensated and/or resettled based upon mechanisms defined in a Resettlement Action Plan (RAP), which should be developed and approved by the relevant Lead Agency

- (ii) Implement the project activities in conformity with the planning provisions for the area as provided for by the local government authorities of Bulambuli and Kween districts, and in accordance with the requirements under the Physical Planning Act, 2010, and other relevant laws.

- (iii) Ensure members of the community are represented at an appropriate level of project implementation, and that representation is balanced across gender, age and tribe.

- (iv) Put in place mechanisms - chance finds and avoidance procedures - to guide the management of lands and humans remains whenever they are found.

- (v) Ensure that the project benefits the community members, and where they are eligible, they should be employed to provide casual labour.

- (vi) Where water sources, such as springs and boreholes, are affected by the project, ensure you replace them as necessary. In addition, designate and install drinking water points and cattle paths for cattle keepers and their cattle, since the project area includes

NEMA House
Plot 177/921 Jinja Road
P.O. Box 22255, Kampala Uganda

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NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)



Figure 1. Location of the project at the Bulambuli-Kween border

original water points and cattle paths, and plan for the establishment of alternative grazing or fodder areas to sustain the livestock industry in the area.

(vii) Seek guidance and approval from the Directorate of Water Resources Management to tap and divert water from River Atari, and ensure that the environmental flows of Atari River, both upstream and downstream, are observed and complied with as prescribed by the Directorate of Water Resources Management (DWRM), in accordance with the Water (Water Resources Regulations) S.I. No. 152-1, in order to sustain the hydrological functions of the River.

(viii) Ensure that works on the river, such as, flow intake, dykes, working platforms, sedimentation basin, screens at intake and fishways, which are intended to divert water to irrigation plots, avoid flooding, mitigate bank erosion and sediment input, guard against sediment transfer along the course of the river, avoid diversion of macro-aquatic

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NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

fauna into irrigation canals, and avoid disrupting fish, respectively, are approved by NEMA.

(xi) Obtain approvals of the structural and site layout plans, and alignments of the irrigation components/infrastructure from the relevant Lead Agencies, including the DWRM, Bulambuli and Kween Districts Local Government Authorities, and Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). In doing so, ensure dykes are placed 30 meters on either side of the course, and that the design is the most appropriate to mitigate floods and limit encroachment of the floodplain and ecologically sensitive areas, but that it also takes into account the requirement for a proportionate amount of land for cultivation. Further, ensure you put in place mechanisms to protect the buffer along the river course, since this is a refugia for a host of fauna.

(xii) Seek approval from NEMA to use wetlands in the area, and ensure the project excludes ecologically sensitive areas, which were mapped during the Environmental and Social Impact Assessment study. Share the site map showing these areas with NEMA and Uganda Wildlife Authority, and monitor them for coverage and habitat quality.

(xiii) Conduct periodic water and soil quality tests of soil and water in the irrigation scheme area and of waters of Atari River, in order to minimize deterioration of soil and water quality in the project area and its environs, in accordance with the Water (Water Resources Regulations) S.I. No. 152-1 and other relevant laws and standards, and as shall be prescribed by the DWRM, among others.

(xiv) Obtain the necessary guidance and approval from MAAIF regarding the range of agro-chemicals (artificial fertilisers, pesticides, among others) that are permitted for use in crop farming activities, especially those applicable to irrigation schemes, but also institute a programme that will ensure the conduct of good farming practices, non-reliant on agro-chemicals and also less dependent on fertilizers.

(xv) In accordance with the National Environment (Waste Management) Regulations, 153-2, collect, sort and contain all solid waste (e.g. construction debris, muck, excavated soil, metal scrap) and garbage in a proper manner, and dispose of the waste in locations gazetted as waste dump-sites by the Local Authorities.

(xvi) Contract only hazardous waste handlers licensed by the National Environment Management Authority (NEMA), to collect and dispose of hazardous waste including waste-oil, used plastics/polythene materials, contaminated materials, in line with the National Environment (Waste Management) Regulations, S.I 153-2.

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NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

- (xv) Carry out annual environmental audits in accordance with the best available practices (taking into account advances in science and technology) as stipulated in Section 6 of the National Environment (Audits) Regulations, 2006, and submit the first environmental audit report by August, 2018.
- (xvi) Carryout separate Environmental and Social Impact Assessments for any planned components (such as, **processing facilities**) of the project that are not subject of this approval, in line with the Environmental Impact Assessment (EIA) Regulations, S.I. 153-1.
- (xvii) In accordance with Section 22(4) of the National Environment Act (NEA), Cap. 153, take all reasonable measures and mitigate any other undesirable environmental impacts that may arise during the implementation of the project, but were not contemplated during the initial environment impact assessment and by the time of issuing this Certificate of Approval, and report on those measures to the relevant Lead Agencies and this Authority.

2.0 GENERAL CONDITIONS OF APPROVAL

- (xviii) Liaise with the Bulambuli and Kween Districts Local Government authorities to sensitize the concerned local communities about the Project and its associated impacts; and, put in place a grievance committee to address any issues that may arise during the project implementation phases.
- (xix) Ensure that matters pertaining to shared resources and services utilized by the local communities (*including access to public utilities and services, access road, water sources*) are handled in a proper manner, in liaison with the Local Authorities in order to minimize social conflict.
- (xx) Put in place adequate Occupational Health and Safety (OHS) measures and procedures to cater for workers during the implementation of the project, including training, first aid and barricades with warning tapes; and ensure that workers are adequately protected from exposure to excessive dust, noise, agrochemicals, or any other occupational hazards, as stipulated in the Occupational Safety and Health Act, 2007.
- (xxi) Institute a STD and HIV/AIDS awareness and prevention programme to sensitize project-related staff/workers, the community residing and/or working around the project, among others, on issues relevant public health issues related to the afore-mentioned subject.



NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

- (xxii) Control the levels of noise during construction and project implementation phases of the Project, and maintain the noise levels within limits stipulated in the National Environment (Noise Standards and Control) Regulations, S.I.No. 30/2003.
- (xxiii) Put in place an appropriate and comprehensive **disaster-preparedness and emergency response plans**, to cater for both the construction and operational phases of the Project.
- (xxiv) Display copies of this Certificate of Approval in strategic locations at the project offices, and should be available at all times.
- (xxv) Fulfill any other conditions and requirements as may be prescribed from time to time by the Bulambuli and Kween Districts Local Government Authorities, NEMA, MAAIF, DWRM, and other relevant Lead Agencies.
- (xxvi) Implement the environmental and social management and monitoring plan as outlined in the Environmental and Social Impact Assessment report, and ensure record keeping as required under Section 77 of the National Environment Act, Cap. 153, and their transmission to this Authority as required under Section 78 of the Act.

3.0 CONSTRUCTION PHASE CONDITIONS OF APPROVAL

- (xxvii) Undertake construction activities during **day-time hours (7.00am to 6.00pm)**.
- (xxviii) Ensure community members continue to use the land during construction, and that where this is not possible, consider them as project affected persons and compensate them as guided by the RAP.
- (xxix) Construct canals using materials that protect against channel erosion, and during operation, stabilize canals to avoid seepage, hence waterlogging of fields, and locate canals and dykes where they do not obstruct natural drainage.
- (xxx) Conduct most of the construction activities during the dry season in order to minimize road damage, and seek the necessary approvals from the Uganda National Roads Authority (UNRA) to connect access roads to the main roads in the area.
- (xxxi) Use specially designed trucks to transport project-related materials and different kinds of waste, in order to prevent littering, spillage and leakage of such materials/substances; and the trucks should bear phrases that convey a message



NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

(xxxix) Restore all parts of the project site laid bare during the conduct of construction activities and decommissioning phase by proper landscaping and re-vegetation using suitable indigenous species of trees/grass.

(xi) Ensure to avoid introduction to and spread of alien/invasive plant species across the project area.

(xii) Ensure that all pollutants and polluted material is contained and adequate mitigation measures provided for safe disposal of the same during this phase of the project.

7.0 SUSPENSION / WITHDRAWAL / CANCELLATION CONDITIONS

(xiii) This Certificate of Approval may be withdrawn or cancelled due to the following:

(a) if there is no compliance with any of the **Specific Conditions** set out in this Certificate in Section 1.0 above, and any other **substantive general provisions** of this Certificate;

(b) where there is a substantial modification of the project implementation or operations which may lead to the emergence of **un-assessed adverse environmental impacts** that were not evaluated at the time of issuing this Certificate of Approval; and,

(c) where there arise substantive undesirable effects that were not contemplated by the time of issuance of this Certificate of Approval.

DATED AT KAMPALA ON 2ND AUGUST, 2017

Signed: *[Signature]*
EXECUTIVE DIRECTOR (NEMA)

c.c. The Permanent Secretary,
Ministry of Agriculture, Animal Industry and Fisheries,
ENTEBBE.

Attn: The Director, Directorate of Crop Resource,

c.c. The Director,
Directorate of Water Resources Management,
ENTEBBE.

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NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

c.c. The Chairperson LC-V,
Bulambuli District Local Government,
BULAMBULLI.

c.c. The Chairperson LC- V,
Kween District Local Government,
KWEEN.

c.c. The Resident District Commissioner,
Bulambuli District,
BULAMBULLI.

c.c. The Resident District Commissioner,
Kween District,
KWEEN.

c.c. The Chief Administrative Officer,
Bulambuli District Local Government,
BULAMBULLI.

c.c. The Chief Administrative Officer,
Kween District Local Government,
KWEEN.

c.c. The District Environment Officer,
Bulambuli District Local Government,
BULAMBULLI.

c.c. The District Environment Officer,
Kween District Local Government,
KWEEN.

c.c. The Sub-county Chief,
Bunambuye Sub-county,
BULAMBULLI.

c.c. The Sub-county Chief,
Ngenga Sub-county,
NGENGE.

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ATTACHMENT-2 ENVIRONMENTAL CHECK LIST

Category	Environmental Item	Main Check Items	Yes (Y) No (N)	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) Y (c) N (d) Y	(a) and (b) EIA report has been completed and approved by NEMA. (c) It was approved under the conditions that the developer shall confirm safety, health, operational and environmental protection and to carry out their commitments. (d) Environmental audit permit, water use permit, construction permit and National road to connect access road permit are required.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design? (c) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y (b) Y (c) Y	(a) Affected persons have been informed of the project. They welcome the project. (b) The project design has been reflected by the comment of the stakeholders. (c) In the early stage of the Project, river course plan was examined as an alternative for flood protection dyke. In addition, in the next stage, alignment of protection dyke and protection area was examined considering flood control, environmental impact, biodiversity, social impact, etc. It was proposed a protection zone which can minimize damages to assets such as farmland of the people.
2 Mitigation measures	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate user/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a) Y (b) Y	(a) MAAIF will establish a WUA and give guidance about water pollution. Regarding standards, MAAIF will establish. For increasing awareness of the standards among farmers, MAAIF will take action as an activity of WUA. (b) It will be established by MAAIF.
	(2) Waste	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a) Y	The waste is predicted to generate just a soil. The generated waste by the construction will be reused for other purposes such as constructions of irrigation canals.
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemical management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a) N (b) Y (c) N	(a) MAAIF confirmed that threat of salinity has not been reported in the project area. (b) MAAIF will take to prevent soil contamination. (c) As of now, there is no management plans on agrochemicals. However, MAAIF will develop a site specific agro chemicals management plan and also establish a WUA.
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	Ground subsidence is not anticipated during construction and operation, since the project will not plan to do

Category	Environmental Item	Main Check Items	Yes (Y) No (N)	Confirmation of Environmental Considerations
3 Natural Environment	(5) Odors	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants? (b) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N (b) Y	activities causing the ground subsidence. The Project is not anticipated to generate serious offensive odor. Since a certain level of impacts to the Ramsar Convention wetland by the river water from the protected area during construction and operation phases respectively is anticipated, careful management of river water is required in order to secure the preservation.
	(1) Protected Areas	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a) N (b) Y (c) Y (d) N (e) Y	(a) The Project site is outside of the Ramsar Convention wetland. (b) The area has variety of faunal and floral species and the construction work will give adverse impacts on the wetland ecosystem like loss of some plants and wild animal habitats. Based on the ESIA survey, a few animals (Gray-crowned crane, etc.) to be treated carefully were observed. (c) There is a possibility that the Project will cause several impacts of breeding and feeding grounds for valuable wildlife. However, there are so many alternative areas nearby the project site. (d) The project will not generate additional livestock or other animals that could lead to overgrazing. (e) If necessary, MAAIF will take measures to reduce the impacts on the ecosystem.
4 Social Environment	(1) Resettlement and Land expropriation	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Is the compensation going to be paid prior to the resettlement? (e) Is the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts	(a) Y (b) Y (c) Y (d) Y (e) Y (f) Y (g) Y (h) Y (i) Y (j) N	(a) Resettlement of several structures and land acquisition will be required. It was examined to minimize the land to be acquired and to avoid resettlement as much as possible. (b) Series of Stakeholder meeting and additional meetings with individual PAPs to discuss basic compensation policy for the PAPs have been conducted. (c) Compensation cost for land and assets to be acquired is estimated following the governmental regulations in considering with results of socioeconomic studies. (d) Prior to land acquisition, sufficient compensatory Livelihood support shall be provided to whole PAPs. (e) It is included in the RAP report which has been prepared in the Outline Design stage. (f) In the RAP, special consideration for vulnerable groups is considered. (g) At the stakeholder meeting, the representatives of PAPs welcomed the project. The Project is Outline Design stage; therefore, after official approval

Category	Environmental Item	Main Check Items	Yes (Y) No (N)	Confirmation of Environmental Considerations
		of resettlement? (i) Is the grievance redress mechanism established?	(d) Y	of the project between both Uganda government and Japanese government, final census and asset survey will be done. After that, final agreement between Government of Uganda and individual PAPs on the compensation will be exchanged. (b) RAP implementation Committee (RIC) will be established during implementation stage. The capacity and budget will be secured to implement the plan. (i) A proposed draft monitoring plan including internal monitoring and external monitoring will be documented in the report. (j) Grievance Committee will be established and will handle complaints in collaboration with traditional mediator.
(2) Living and Livelihood		(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary? (b) Is proper allotment made for rights to agricultural land user? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources? (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely affect the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?	(a) N (b) Y (c) Y (d) Y (e) Y	(a) It was examined to minimize the land acquisition and relocation as much as possible. (b) Farmers cultivating in the downstream can access stable irrigation water, some of which are exported. (c) The Project will obtain the water use permit form MWEE and establish Water Users Association. (d) The Project is designed with 10-year probability drought discharge for river maintenance flow. (e) Probably, it can be caused. If necessary, MAAIF will give a health education.
(3) Heritage		(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) There is a possibility that several graves are required to be moved. If it cannot be avoided, the Project will pay the special consideration.
(4) Land scape		(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) There is no special and esthetic landscape in and around the site.
(5) Ethnic Minorities and Indigenous Peoples		(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) N (b) N	(a)-(b) No minority people is observed in the Project area.
(6) Working Conditions		(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project	(a) N (b) Y (c) Y	(a)-(c) The implementation of the project considers the safety of the working individuals by conducting

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Category	Environmental Item	Main Check Items	Yes (Y) No (N)	Confirmation of Environmental Considerations
5. Others	(1) Impacts during Construction (2) Monitoring	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts? (a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities? (a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked. (a) If necessary, the impacts to trans-boundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as trans-boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) Y (b) Y (c) Y (a) Y (b) Y (c) Y (d) Y	(a), (c) These measures will be executed so that it is less impacted during construction. (b) No significant impact on the natural environment is anticipated. (a) Monitoring parameters are proposed. (b) Practical methods like sampling on a regular basis are proposed in ESIA report. (c) It is included in the ESIA report. (d) Draft monitoring format is attached in the ESIA report.
6. Note	Reference to Checklist of Other Sectors Note on Using Environmental Checklist		(a) N (b) N (a) N	(a) The Project will not affect forestry, since there is no forest area within the Project area. (b) The Project will not construct large-scale weirs, dams and reservoirs. (a) Such big scale of environmental impact is not anticipated and the construction site is enough far away (longer than 40km) from the international boundaries.

Remarks:
- EIA:
- ESIA:
- NEMA:
- MAAIF:
- WUA:
- PAPS:
- RAP:

Environmental Impact Assessment
Environmental and Social Impact Assessment
National Environment Management Authority
Ministry of Agriculture, Animal Industry and Fisheries
Water Users Association
Project Affected Persons
Resettlement-Action Plan

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ATTACHMENT-3 ENVIRONMENTAL MANAGEMENT PLAN/ ENVIRONMENTAL MONITORING PLAN

3-1 Environmental Management Plan

No.	Potential Impact	Mitigation Measures		Responsibility		Estimated Cost or Burden Organization
		Pre-/ during Construction	Implementation	Pre-/ during Construction	Implementation	
1	Air Pollution	<ul style="list-style-type: none"> - Water sprinkling near residential area - Speed limit for construction machines at construction sites adjacent to settlement areas 	Construction contractor	Supervising consultant, MAAIF	Construction contractor	Construction contractor
2	Water Pollution	<ul style="list-style-type: none"> - Discharge through sedimentation pond and silt fence - Installation of portable toilet for workers - Appropriate waste and construction machines management 	Construction contractor	Supervising consultant, MAAIF	Construction contractor	Construction contractor
3	Soil Contamination	[Excavated soil] <ul style="list-style-type: none"> - Reuse or dispose at designated disposal site after treatment. [Oil from machinery] <ul style="list-style-type: none"> - Maintain the machinery and vehicle to prevent oil leakage - Construction waste (trees and waste soil) - After considering the possibility of reuse, construction waste is disposed at designated disposal area 	Construction contractor	Supervising consultant, MAAIF	Construction contractor	Construction contractor
4	Waste	[Waste from base camp] <ul style="list-style-type: none"> - Waste at workers camp and waste oil shall be brought to disposal site or facility [Night soil] <ul style="list-style-type: none"> - Temporary sanitation facility such as septic tank shall be introduced to the workers camp. 	Construction contractor	Supervising consultant, MAAIF	Construction contractor	Construction contractor
5	Noise and Vibration	[Construction noise] <ul style="list-style-type: none"> - Installing noise barrier and selecting low-noise equipment when necessary - Avoiding works of heavy equipment during night time. - Informing the construction schedule to surrounding communities to obtain their consensus. 	Construction contractor	Supervising consultant, MAAIF	Construction contractor	Construction contractor
6	Flora, Fauna and Biodiversity	<ul style="list-style-type: none"> - Restrict the construction activities only to the project foot print areas - Spare large trees by circumventing them as much as possible - For wetland management, collaborate the monitoring framework by the JICA's wetland management project 	Construction contractor	Supervising consultant, MAAIF	Construction contractor, MAAIF	Construction contractor, MAAIF

No.	Potential Impact	Mitigation Measures		Responsibility		Estimated Cost or Burden Organization
		Pre-/ during Construction	Implementation	Pre-/ during Construction	Implementation	
7	Protected Areas	<ul style="list-style-type: none"> - Discharge through sedimentation pond and silt fence - Installation of portable toilet for workers - Appropriate waste and construction machines management - Maintain strength of slope in order to avoid erosion at borrow pits - Control water use for construction from the river - Monitor water flow as appropriate - Secure waterways in construction area 	Construction Contractor Farmers' Associations in the Project area, District Local Governments of Bulambuli and Kween	MAAIF	Construction contractor	Construction contractor
8	Soil Erosion	<ul style="list-style-type: none"> - Conduct appropriate compensation and livelihood assistance in accordance with RAP 	MAAIF	Office of the Chief Government Valuer (CGV)	Construction contractor	1,384,072,209 UGX for RAP Implementation*
9	Hydrological Situation	<ul style="list-style-type: none"> - Conduct appropriate compensation and social assistance in accordance with RAP 	MAAIF	Farmers' Associations in the Project area, District Local Governments of Bulambuli and Kween	Construction contractor	1,384,072,209 UGX for RAP Implementation*
10	Involuntary Resettlement/ Land Acquisition	<ul style="list-style-type: none"> - Layout the construction machinery properly 	Construction contractor	Supervising consultant, MAAIF	Construction contractor	Construction contractor
11	Local Economy such as Employment and Livelihood, etc.	<ul style="list-style-type: none"> - Conduct appropriate land acquisition and compensation management 	MAAIF	Farmers' Associations in the Project area, District Local Governments of Bulambuli and Kween	MAAIF	MAAIF
12	Landscape	<ul style="list-style-type: none"> - Install safety sign boards - Install fences around the construction site to keep out local people such as children - Install parking for idling construction machines 	Construction contractor	Supervising consultant, District Local Governments of Bulambuli, and Kween	Construction contractor	Construction contractor
13	Land Use and Utilization of Local Resources	<ul style="list-style-type: none"> - Conduct appropriate compensation and social assistance in accordance with RAP 	MAAIF	District Local Governments of Bulambuli and Kween	MAAIF	1,384,072,209 UGX for RAP Implementation*
14	Existing Social Infrastructures and Services	<ul style="list-style-type: none"> - Arrange conflicts happened to solve (e.g. boundary conflict etc.) 	MAAIF	District Local Governments of Bulambuli and Kween	MAAIF	MAAIF
15	The Poor, Indigenous and Ethnic People	<ul style="list-style-type: none"> - Discharge through sedimentation pond and silt fence 	Construction Contractor, MAAIF	District Local Governments of Bulambuli and Kween	Construction contractor, MAAIF	MAAIF
16	Local Conflict of Interests	<ul style="list-style-type: none"> - Conduct appropriate support in 	MAAIF	District Local Governments of Bulambuli and Kween	MAAIF	MAAIF
17	Water Usage or Water Rights and Rights of Common	<ul style="list-style-type: none"> - Conduct appropriate support in 	MAAIF	District Local Governments of Bulambuli and Kween	MAAIF	MAAIF
18	Gender/ Children's	<ul style="list-style-type: none"> - Conduct appropriate support in 	MAAIF	District Local Governments of Bulambuli and Kween	MAAIF	MAAIF

No.	Potential Impact	Mitigation Measures during Construction	Responsibility	Estimated Cost or Burden Organization
		Pre-Construction	Implementation	Supervise
19	Rights Hazards (Risk), Infectious Diseases such as HIV/AIDS	<ul style="list-style-type: none"> - In order to prevent child labor, promote awareness of the construction contractor - Install sufficient drainage facilities not to provide habitat for vector mosquito - Provide adequate temporary sanitation facilities - Enforce medical screening and periodical medical check-up - In order to prevent spread of infectious diseases such as HIV/AIDS, promote awareness of the laborers and local people - In order to prevent crimes including sexual harassment toward women due to inflow of construction workers, promote awareness of the workers and local people - Recommendation to expel vector shellfish and wear boots 	<ul style="list-style-type: none"> Construction contractor MAAIF, District Local Governments of Bulambuli and Kween, MoH, MoGLSD 	Construction contractor, MAAIF
20	Working Conditions/Accidents	<ul style="list-style-type: none"> - Provide safety training for the workers - Conduct safety patrol at the construction site 	Construction contractor	Supervising consultant, MAAIF, MGLSD (OSH Department), District Local Governments of Bulambuli, and Kween
21	Accident	<ul style="list-style-type: none"> - Install safety sign boards around the construction site to keep out local people such as children - Install parking for idling construction machines - Restrict mobilization speed in and near the construction site - Setup of a sign for accident warning, regular canal patrol and recommendation of reporting when finding a destructive animal - In order to prevent accident of the child, provide safety education in the elementary school of the neighborhood. 	Construction contractor	Supervising consultant, MAAIF, District Local Governments of Bulambuli, and Kween
22	Monitoring System	<ul style="list-style-type: none"> - Supervise monitoring activity by the construction contractor - Make a routine of reporting monitoring results 	Construction contractor	Supervising consultant, MAAIF
In Operation				
1	Water Pollution	<ul style="list-style-type: none"> - Train farmers to ensure optimum use farm imputes and the practices - Conduct periodic monitoring 	MAAIF Farmers' Associations in the Project area	District Local Governments of Bulambuli and Kween
2	Soil Contamination	<ul style="list-style-type: none"> - Replace the soil seriously damaged by salt - Train farmers to reuse 	MAAIF Farmers' Associations in the Project area	District Local Governments of Bulambuli and Kween

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No	Item	Parameter	Method	Location	Frequency	Responsibility
1	Air Pollution	Dust, exhaust gas from (machinery)	Visual inspection	Near the construction site facing sensitive receptor (house, school etc.)	When heavy machine operating	Contractor & Subcontractor
2	Water Pollution	pH, EC, DO, TDS, TN, TP	Sampling test	2 points: 1) Upstream of Headwork to be constructed 2) After drainage canal to be constructed	Monthly (except TN, TP)	Contractor & Subcontractor
3	Soil Contamination	Turbidity & oil Existence of oil in soils pH & EC	Visual inspection	Model Sites of Land Re-organization	Daily As appropriate (when Water Pollution becomes worse)	Contractor & Subcontractor
4	Waste	Volume of waste soil, and domestic garbage	Visual inspection	Excavated site, dumping site, workers camp	Daily	Contractor
5	Noise and Vibration	Noise: Laed (during operating heavy machine)	Visual inspection	Where heavy machine operating	As appropriate	Contractor & Subcontractor
6	Fauna, Flora & Biodiversity	Extent of disturbance of habitat and species (species, population, location)	Visual inspection	Major construction area	Monthly	Contractor & Subcontractor
7	Hydrological	Volume of river flow	Portable flow velocity meter and staff gauge	At the end of river bed protection	Monthly	Contractor & Subcontractor
8	Involuntary Resettlement/ Land Acquisition	Progress of RAP program (compensation, livelihood assistance)	Hearing from persons concerned	Affected parishes	Quarterly, or when required	MAAIF
9	Local Economy such as Livelihood & etc.	Progress of RAP program (compensation, livelihood assistance)	Hearing from persons concerned	Affected parishes	Quarterly, or when required	MAAIF
10	Landscape	Complaint about the landscape from local people	Hearing from persons concerned	Wherever complains take place.	As appropriate	Contractor & Subcontractor
11	Land Use and Utilization of Local Resources	Progress of RAP program (compensation, livelihood assistance)	Hearing from persons concerned	Affected parishes	Quarterly, or when required	MAAIF

3-2 Environmental Monitoring Plan

No.	Potential Impact	Mitigation Measures Pre-/ during Construction	Implementation	Responsibility Supervise	Estimated Cost or Burden Organization
14	Water Usage or Water Rights and Rights of Common	- Install alternative water distribution system when unexpected situation such as reduction of spring water and water level of wells	MAAIF Farmers' Associations in the Project area	District Local Governments of Bulabul and Kwean	MAAIF
15	Gender/ Children's Rights	- Conduct appropriate support in accordance with RAP	MAAIF Farmers' Associations in the Project area	District Local Governments of Bulabul and Kwean	MAAIF
16	Hazards (Risk), Infectious Diseases such as HIV/AIDS	- Promote awareness of diseases to local people - Install windows of health consultation - Recommendation to expel vector shellfish and wear boots	MAAIF Farmers' Associations in the Project area	District Local Governments of Bulabul and Kwean, MoH, MoGLSD	MAAIF
17	Accident	- Train to comply with traffic rules - Install safety sign boards for traffic and animal attack - Setup of a sign for accident warning, regular canal patrol and recommendation of reporting when finding a destructive animal	MAAIF	MAAIF	MAAIF
18	Monitoring System	- Supervise monitoring activity by the supervisor - Make a routine of reporting monitoring results	MAAIF	MAAIF	MAAIF

Source: Environmental Impact Assessment (Ministry of Agriculture, Animal Industry, and Fisheries, 2017)

Remarks:

- MAAIF: Ministry of Agriculture, Animal Industry and Fisheries
- DWD: Directorate of water Development
- DWRM: Directorate of Water Resources Management
- WMD: Department of Wetlands Management
- CGV: Chief Government Valuer
- DPO: District Program Office
- DISO: District Internal Security Office
- MoH: Ministry of Health
- MoGLSD: Ministry of Gender, Labor and Social Development
- OSH: Occupational Safety and Health

No	Item	Parameter	Method	Location	Frequency	Responsibility
1	Water Pollution	Quantitative pH, EC, DO, TDS, TN, TP	Sampling test	3 points: 1) Upstream of Headworks 2) Confluence point of drainage canal and Ajaru River 3) Downstream of confluence point	Monthly (except TN & TP), Biannually (TN & TP)	MAAIF
1	Water Pollution	Qualitative Turbidity, Oil	Visual inspection	3 points: 1) Upstream of Headworks 2) Confluence point of drainage canal and Ajaru River 3) Downstream of confluence point	Monthly (except TN & TP), Biannually (TN & TP)	MAAIF
3	Soil Contamination	pH & EC	Visual inspection	Model Sites of Land Re-organization	Monthly	MAAIF
4	Waste	Volume of soil and garbage	Visual inspection		Monthly	MAAIF
5	Fauna, Flora & Biodiversity	Extent of disturbance of habitat and species (species population, location)	Visual inspection (Census survey)	Major construction area	Annually	MAAIF
6	Groundwater	Quantitative pH, EC, DP, TDS, TN, TP	Visual inspection	1) Upstream of the Project Site (outside of the Project Site) 2) Downstream of the Project Site (within the Project Site)	Monthly (except TN & TP), Biannually (TN & TP)	MAAIF
7	Hydrological Situation	Volume of river flow	Potable flow velocity meter and staff gauge	At the end of river bed protection	Monthly	MAAIF
8	Local Economy such as Employment, Livelihood & etc.	Progress of livelihood assistance	Hearing from persons concerned	Affected parishes	Quarterly, or when required	MAAIF
9	Land Use & Utilization of Local Resources	Progress of land use management guideline	Hearing from persons concerned	Affected parishes	Quarterly	MAAIF
10	Split in Community	Number of riftions between communities	Hearing from persons concerned	Affected parishes	Annually	MAAIF & Local Government Uganda
11	The Poor	Number of complaints	Hearing from persons concerned	Affected parishes	Quarterly	MAAIF & Local Government Uganda

No	Item	Parameter	Method	Location	Frequency	Responsibility
12	Existing Social Infrastructure & Services	Extent of damage to existing infrastructure such as community roads etc.	Visual inspection	Facilities which the construction give impacts (vehicle roads etc.)	Monthly	Contractor & Local Government Uganda
13	The Poor, Indigenous & Ethnic People Interests	Progress of RAP program (compensation, land acquisition, livelihood (compensation, land acquisition, livelihood assistance)	Hearing from persons concerned	Affected parishes	Quarterly, or when required	Construction Supervisor, Local Government Uganda
14	Local Conflict of Interests	Cause of conflict	Hearing from persons concerned	Construction area & affected parishes	As appropriate	MAAIF & Local Government Uganda
15	Water Usage or Rights of Common	Same as No.13	Visual inspection	Same as No.13	Same as No.13	Contractor & Subcontractor
16	Gender/Children's Rights	Progress of RAP program (compensation, land acquisition, livelihood (compensation, land acquisition, livelihood assistance) Number of child labors Number of crimes including sexual harassment toward women Number of raised patients Number of raising awareness consultation Number of raising awareness consultation including sexual harassment toward women	Hearing from persons concerned	Affected parishes	Quarterly, or when required	MAAIF, Contractor & Subcontractor
17	Hazards (Risks), Infectious Diseases such as HIV/AIDS	Number of raised patients Number of raising awareness consultation Number of raising awareness consultation including sexual harassment toward women	Hearing from persons concerned	Construction area, Workers camp & Affected parishes	Quarterly	MAAIF, Local Government Uganda
18	Working Conditions/Accidents	Number of instruments required (helmets, shoes etc.) Number of accidents relating to construction	Construction record made by Contractor and Sub-contractor	Construction area & Workers camp	Quarterly	Contractor
19	Accident	Number of accidents happened Number of the safety education at the elementary school	Construction record made by Contractor and Sub-contractor	In the project area (especially outside the construction area)	Quarterly	Contractor & Subcontractor
20	Monitoring System	Progress of monitoring activity as scheduled	Hearing from persons concerned	Monitoring forms and reports	Quarterly	MAAIF & Consultant

ATTACHMENT -4 ENVIRONMENTAL MONITORING FORM

Construction Phase	
1. Response/Action to Comments and Guidance from Government Authorities and the Public	
Monitoring Item	Monitoring Results during Report Period
No. and contents of formal comments made by the public	
No. and contents of responses from Gov authorities	

2. Pollution

Item	Unit	Measured Value (mean)	Measured value (max)	Project Standard	Measurement point	Frequency
Dust (PM10) (instrument)	µg/m³			300	Where heavy machine operating	When heavy machine operating
Visual inspection (qualitative)	Item	Monitoring result			Measurement point	
*1: WHO's Guidelines Value						

Water Quality

Item	Unit	Measured Value (mean)	Measured value (max)	Project Standard	Measurement point	Frequency
Quantitative Analysis						
pH	-			6.5-8.5	2 points:	
EC	µS/cm			25,000	1) Upstream of Headwork to be constructed	Monthly (except TN & TP), Biannually (TN & TP)
TDS	mg/L			6.5*1	2) After drainage canal to be constructed	
TN	mg/L			1.7*1		
TP	mg/L			0.3*1		
Qualitative Analysis						
Item		Monitoring result			Measurement point	
Turbidity	-			-		
Oil	-			-		

*1: Maximum values obtained by baseline survey during dry season.

Soil Contamination

Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Measurement Point	Frequency
Extent of oil in soils			Model Sites of Land Re	Daily
pH			As appropriate	As appropriate
EC				

Waste

Monitoring Item	Date	Measured value	Measurement Point	Note	Frequency
Volume of soil (m³)					Daily
Volume of garbage (m³)					Daily

Noise

Item	Unit	Measured Value (mean)	Measured value (max)	Project Standard*1	Measurement point	Frequency
L _{Aeq}	dB(A)			58	Where heavy machine operating	As appropriate

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No	Item	Parameter	Method	Location	Frequency	Remarks:
12	Benefit & Damage	Number of complaints	Hearing from persons concerned	Affected parishes	Quarterly	
13	Local Conflict of Interests	Number of conflicts	Hearing from persons concerned	Affected parishes	Quarterly	
14	Water Usage or Rights of Common	Number of complaints	Visual inspection	Affected parishes	Quarterly	
15	Gender/Children's Rights	Number of female-headed household Number of female membership (to be established) Number of female participants to the community consultation meeting	Hearing from persons concerned	Affected parishes	Quarterly	MAAIF & Local Government concerned Uganda
16	Hazards (Risks), Infectious Diseases such as HIV/AIDS	Number of infected patients	Hearing from persons concerned	Affected parishes	Biannually	MAAIF & Local Government concerned Uganda
17	Accident	Number of accidents happened	Hearing from persons concerned	Affected parishes	Quarterly	MAAIF & Local Government concerned Uganda
18	Monitoring System	Progress of monitoring activity as scheduled	Hearing from persons concerned	Monitoring forms & reports	Quarterly	MAAIF & Local Government concerned Uganda

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- *1: Maximum value obtained by baseline survey during dry season.
- *2: WHO's Guidelines value (outdoor) for residential area.

3. Natural Environment

Fauna, Flora & Biodiversity (1) Birds		Monitoring Results during Report Period	Measures to be Taken	Frequency
Monitoring Item	Species: Population: Location:			
Gray-crowned Crane (<i>Baleaica regitorum</i>)	Species: Population: Location:			
Pallid Harrier (<i>Circus macrourus</i>)	Species: Population: Location:			
Fox's Weaver (<i>Ploceus spekeoides</i>)	Species: Population: Location:			
Shoebill (<i>Balaeniceps rex</i>)	Species: Population: Location:			
(2) Others:				
Monitoring Item	Species: Population: Location:	Monitoring Results during Report Period	Measures to be Taken	Frequency
Extent of disturbance of habitat and species	Species: Population: Location:			
Extent of disturbance of habitat and species	Species: Population: Location:			
Hydrological Situation				
Monitoring Item	Measures to be Taken	Monitoring Results during Report Period	Measurement Point	Frequency
Volume of river flow (m ³ /s)	Portable flow velocity meter and staff gauge		At the end of river bed protection	Monthly

Operation Phase

1. Response/Action to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
No. and contents of formal comments made by the public	
No. and contents of responses from Gov. authorities	

2. Pollution

Water Quality						
Item	Unit	Measured Value (mean)	Measured value (max)	Project Standard	Measurement point	Frequency
Quantitative Analysis						
pH	-			6.5-8.5	3 points: 1)Upstream of Headworks	Monthly (except TN & TP), Biannually (TN & TP)
EC	uS/cm		25,000	6.5*1	2)Confluence point of drainage canal and Atari River	
DO	mg/L		6.5*1	62*1	3)Downstream of confluence point	
TDS	mg/L		62*1	1.7*1		
TN	mg/L		1.7*1	0.3*1		
TP	mg/L		0.3*1			
Qualitative Analysis						
Turbidity						
Oil						
Monitoring for the pesticides use						
Aldrin	ug/g			0.01*3	3 points: 1) Upstream of Headworks	Biannually (1 time x 2 farming seasons)
Atrazine	ug/g			2.0*3	2)Confluence point of drainage canal and Atari River	
DDT	ug/g			0.025*3	3)Downstream of confluence point	
Endosulfan	ug/g			0.01*3		
Endrin	ug/g			0.04*3		
Simaxine	ug/g			0.03*3		

*1: Maximum values obtained by baseline survey described in EIA (2017) during dry season.

*2: Japan's environmental standards for type-C river water (3rd class for fishery and 1st for industrial water)

*3: Environmental Quality Standard for Substances And Certain Other Pollutants, European Union

Soil Contamination

Item	Unit	Measured Value (mean)	Measured value (max)	Project Standard	Measurement point	Frequency
pH	-					
EC	uS/cm			50	Model Sites of Land Re-organization	Monthly

Waste

Monitoring Item	Date	Measured value	Measurement Point	Note	Frequency
Volume of soil (m ³)					Monthly
Volume of garbage (m ³)					Monthly

3. Natural Environment

Fauna, Flora & Biodiversity (1) Birds

Monitoring Results during Report Period		Measures to be Taken	Frequency
Monitoring Item	Species: Population: Location:		
Gray-crowned Crane (<i>Baleaica regitorum</i>)	Species: Population: Location:		
Pallid Harrier (<i>Circus macrourus</i>)	Species: Population: Location:		

Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Frequency
Fox's Weaver (<i>Ploceus spekeoides</i>)	Spices: Population: Location:		
Shoebill (<i>Balaeniceps rex</i>)	Spices: Population: Location:		
(2) Others			
Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Frequency
Extent of disturbance of habitat and species	Spices: Population: Location:		
Extent of disturbance of habitat and species	Spices: Population: Location:		

Item	Unit	Measured Value (mean)	Measured Value (max)	Project Standard	Measurement point	Frequency
Groundwater						
Quantitative Analysis						
pH	-			6.5-8.5	Two points of existing wells:	Monthly
EC	uS/cm			25,000	1) upstream of the Project Site (outside of the Project Site)	(except TN & TP)
DO	mg/L			6.5 ¹	2) Downstream of the Project Site (within the Project Site)	Biannually (TN & TP)
TDS	mg/L			62 ¹		
TN	mg/L			1.7 ¹		
TP	mg/L			0.3 ¹		
Qualitative Analysis						
Turbidity	-			-		
Oil	-			-		

*1: Maximum values obtained by baseline survey during dry season.

*2: Japan's environmental standards for type-C river water (3rd class for fishery and 1st for industrial water)

Hydrological Situation			
Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Frequency
Volume of river flow (m ³ /s)	Potable flow velocity	At the end of river bed meter and staff gauge protection	Monthly

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Asset Acquired	Type of Impact	Entitled Persons	Compensation Entitlement	Other Entitlement Measures for Vulnerable Groups and Families
Agricultural land	No displacement: When the remaining land after acquisition is economically viable.	Farmer/ Land owner (Customary, Freehold) (Leasehold)	Cash compensation for the harvest of affected land equivalent to the average market value over three years or the compensation rates established by the District Land Boards in collaboration with the Chief Government Valuer whichever is the higher.	-
Displacement:	When more than 20% of land owned is acquired by the Project, or when less than 20% of land owned is remained after acquisition but the land is not economically viable.	Farmer/ Land owner (Customary, Freehold)	Alternative land where feasible, or cash Valuer whichever is the higher.	-
Relocation assistance in cash or services on a case-by-case basis as is sought.	Where land for land options are chosen by households, Security of tenure: identify new site, assistance from the Project to shifting, and Assistance for re-establishing perennial crops including economic trees up to a maximum of 12 months, while short-term crops mature.	Farmer/ Land owner (Customary, Freehold)	Relocation assistance including costs of replacement land (equivalent to replacement value), or government rates (equivalent to replacement value), or Cash compensation based on activities on remaining land. cannot continue current compensation for the entire land owned, according to PAFs choice. Alternative land will be in terms a new parcel of land of equivalent size and productivity which a secure tenure status without encumbrances at an available location which is acceptable by PAFs.	Relocation assistance in cash or services on a case-by-case basis as is sought.

ATTACHMENT-5 ENTITLEMENT MATRIX

Asset Acquired	Type of Impact	Entitled Persons	Compensation Entitlement	Other Entitlement Measures for Vulnerable Groups and Families
Residential land	No displacement	Tenant/ Leaseholder (Leasehold)	Cash compensation equivalent to the average market value over three years for the mature and harvested crops at the compensation rates as established by the District Land Boards in collaboration with the Chief Government Valuer which is the highest or market value for the remaining period of the tenancy/ lease agreement. Relocation assistance is including costs of shifting + Allowance for re-establishing perennial crops including economic trees up to a maximum of 12 months, while short-term crops mature.	
	Land used for residence partially affected, limited loss and remaining land remains viable for present use.	Rental/ Lease holder (Leasehold)	Cash compensation equivalent to 10% of lease/ rental fee for the remaining period of rental lease agreement.	
	Displacement: Premise used residence severely affected remaining area not sufficient for continued use or becomes smaller than minimally acceptable under the town and Country Planning Act.	Land owner (Customary, Freehold)	Alternative land where feasible or, cash compensation for entire land owned, according to PAPs choice. Alternative land will be minimum plot of acceptable size under the Town and Country Planning Act whichever is larger in the community or a nearby resettlement area with adequate physical and social infrastructure systems as well as a secure tenure status without encumbrances at an available location which is acceptable by the PAPs. Relocation assistance including costs of shifting + Allowance	
	Displacement: Entire structure affected or partially affected but remaining structure	Rental/ Lease holder (Leasehold)	Cash compensation for affected assets (variable improvements to the property by the tenant-e.g., fence). Disturbance compensation to the tenant equivalent to two months' rental costs.	Construction of replacement permanent structure.
		Land owner (Customary, Freehold)	Cash compensation for entire structure, and other fixed assets without depreciation, or alternative structure equivalent or better size	

Asset Acquired	Type of Impact	Entitled Persons	Compensation Entitlement	Other Entitlement Measures for Vulnerable Groups and Families
	not suitable for continued use	Rental/ Lease holder (Leasehold)	Cash compensation for affected assets (variable improvements to the property by the tenant-e.g., fence). Relocation assistance including costs of shifting + Allowance equivalent to four months' rental costs. Assistance to help find alternative rental arrangements. Rehabilitation assistance if required.	Arrangement formal lease with similar conditions to previous lease and provide formal tenancy agreement.
Temporary structure	Loss of temporary structure (e.g., agricultural structure, latrines, fence, etc.)	Land owner (Customary, Rental/ Lease holder (Leasehold)	Cash compensation at government rates, Disturbance allowance, and Top up equal to inflation for increase in cost of construction materials (equal to replacement cost). Assistance in the procurement of construction materials. Building materials may be salvaged from old land, transport and labor assistance to move households or business goods. For those moving to a new settlement, or non-adjacent land, transport and labor assistance to move households or business goods.	Construction of replacement structure.
		Informal dwellers' Squatter/ (Leasehold)	Building materials may be salvaged from old housing adjacent land, transport assistance to move households or business goods. For those moving to a new settlement, or non-adjacent land, transport and labor assistance to move households or business goods.	Building materials may be salvaged from old housing

In the project area, there is no squatter nor informal dwellers.

ATTACHMENT-6 SOCIAL MONITORING FORM

I Monitoring Item: Public Meetings (regardless of official or non-official)
Monitoring Frequency: As per meeting organized

No.	Date	Venue	No. of Participants			Agenda	Comments/ Requests, etc. from Participants
			Male	Female	Total		
1							
2							

Note: Details contents of all meetings should be kept records.

II Monitoring Item: Seminars relevant to the Project¹
Monitoring Frequency: As per seminar organized

No.	Date	Venue	No. of Participants			Agenda	Comments/ Requests, etc. from Participants
			Male	Female	Total		
1							
2							

¹: E.g., Seminars on Pesticides and Fertilizers Use.

III Monitoring Item: Water Users' Association (WUA) Member List
Monitoring Frequency: As per seminar organized

No.	Village/ Parish/ Sub-county/ District	Tick a box (✓)		Name of Member
		Male	Female	
1				
2				

IV Monitoring Item: Complaints relevant to the Project
Monitoring Frequency: Monthly

(1) Summary

Item	Type of Complaints	No. of Complaints	No. of Solved Complaints	No. of Un-solved Complaints
VGRC ¹				
DGRC ²				
Land Tribunals				
a) Village level				
b) Parish level				
c) District level				
Courts of Law				
Other (Specify:)				

¹: Village Grievance Redress Committee
²: District Grievance Redress Committee

(2) Complaint List

No.	Date	Complainant		Name	Detailed Contents of Complaints	Members Concerned
		Tick a box (✓)				
1		Male	Female			
2						

V Monitoring Item: Progress of RAP Activities
Monitoring Frequency: Monthly

Item	Completion Date Period	Expected Date of Completion (if it has not been done yet.)
RAP Finalization Period		
Submission to CGV ¹		
Approval by CGV		
Procurement of RAP Implementation Consultant		

Asset Acquired	Type of Impact	Entitled Persons	Compensation Entitlement	Other Entitlement Measures for Vulnerable Groups and Families (transport at their own cost).
Perennial crops	Loss of perennial crops affected by land acquisition or temporary acquisition or easement	PAPs (where land owner, tenant or squatter)	Cash compensation for perennial crops at district rates (full replacement cost. Transitional allowance of 5% of value of crops per household which loses perennial crops to cover for income loss.	
Annual crops	Loss of seasonal crops affected by land acquisition or temporary acquisition or easement	PAPs (whether land owner, tenant or squatter)	Cash compensation. Prompt announcement of construction schedule not to cultivate annual crops.	
Economic trees	Tree lost	Land owner	Cash compensation based on type, age, and productive value of affected trees. 10% premium of amount of cash compensation.	
Temporary Acquisition	Short term land acquisition for renting during construction. And if there are crops and trees in the renting lands, the contractor will negotiate with owners about the amount of compensation.	PAPs (whether land owner, tenant or squatter)	Though farming activities will be suspended during construction works. Cash compensation for any assets affected, e.g. crops, trees.	

Item	Completion Date Period	Expected Date of Completion (if it has not been done yet.)
Approval for payment by MAALF		
Preparation of Compensation Funds by MAALF		
Disclosure of Compensation Amounts		
Opening Banks Accounts of for PAPs		
Training Programmes		
Payment of compensation to all PAPs		
Grievance Resolution and settlement of disputes		
Implementation of Livelihood Restoration Programmes		
Assistance of Vulnerable People		
External Monitoring and Evaluation		
RAP Audit Report		
RAP Completion		

*1: Chief Government Valuer" under the Ministry of Lands, Housing, and Urban Development

VI Monitoring Item; Monitoring Frequency;	Progress of Compensation Payment, Land acquisition, and Resettlement Quarterly
--	---

Resettlement activity	Planned Total	Unit	Progress in Quantity			Progress in Percentage Up to the last quarter	Expected Date of Completion
			During the quarter	Up to the last quarter	Till the last quarter		
Progress of compensation payment (all lots)		No. of HHs					
Lot 1		No. of HHs					
Lot 2		No. of HHs					
Lot 3		No. of HHs					
Lot 4		No. of HHs					
Progress of Providing Livelihood Support (all lots)		No. of HHs					
Lot 1		No. of HHs					
Lot 2		No. of HHs					
Lot 3		No. of HHs					
Lot 4		No. of HHs					
Progress of land acquisition (all lots)		ha					
Lot 1		ha					
Lot 2		ha					
Lot 3		ha					
Lot 4		ha					
Progress of asset replacement (all lots)		No. of HHs					
Lot 1		No. of HHs					
Lot 2		No. of HHs					
Lot 3		No. of HHs					

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Resettlement activity	Planned Total	Unit	Progress in Quantity			Progress in Percentage Up to the last quarter	Expected Date of Completion
			During the quarter	Up to the last quarter	Till the last quarter		
Lot 4		No. of HHs					
Progress of resettlement of people (all lots)		No. of HHs					
Lot 1		No. of HHs					
Lot 2		No. of HHs					
Lot 3		No. of HHs					
Lot 4		No. of HHs					
Progress of Land Re-organization (all lots: 12 ha)		No. of HHs					
Lot 1		ha					
Lot 2		ha					
Lot 3		ha					
Lot 4		ha					

VII Monitoring Item; Monitoring Frequency;	Economic Situation Quarterly (Simple Random Sampling)
---	--

No.	Sex of HH Head (✓)		Amount of Monthly Income (UGX)				Amount of Expenditure (UGX)				
	Male	Female	1 st	2 nd	3 rd	4 th	1 st	2 nd	3 rd	4 th	
1											
2											

VIII Monitoring Item; Monitoring Frequency;	Household Members Quarterly (Simple Random Sampling)
--	---

Name of HH members	Sex (✓)		Age	Marital status (✓)	Relationship to the HH Head	Residential status	Movement in/ out of household members
	Male	Female					

IX Monitoring Item; Monitoring Frequency;	Hazard and Disturbance Monthly (During Construction)
--	---

Item	Monitoring Results
No. of Households Affected by hazards and Disturbance from Construction	HH(s)
No. of Patients among construction workers	Person(s)
No. of accident relevant to the Project Construction	Accident(s)
Children labor during Project Construction	Person(s)
Crimes by construction workers including sexual harassment	Crime(s)

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X Monitoring Item; Extent of damage to existing Infrastructures Monitoring Frequency: Monthly (During Construction)					
No.	Date	Venue	Details of Contents	Owners of existing infrastructures	Solution
1					
2					

XI Monitoring Item; Case of conflict between construction workers and community members Monitoring Frequency: Monthly (During Construction)				
No.	Date	Venue	Details of Contents	Solution
1				
2				

資料-5. ソフトコンポーネント計画書

ウガンダ国

アタリ流域地域灌漑施設整備計画協力準備調査
ソフトコンポーネント計画書

2018年3月

独立行政法人 国際協力機構（JICA）
株式会社 三祐コンサルタンツ

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1. ソフトコンポーネントを計画する背景

1.1 本体事業の内容

「ウガンダ国アタリ流域地域灌漑施設整備計画協力準備調査」（以下、「本事業」と記す）の目的は、灌漑施設の建設を通じ主に稲作の生産性向上を図ることである。

本事業で対象とする灌漑施設は、(1)取水施設、(2)幹線水路、(3)2次水路、(4)3次水路、(5)排水路、(6)管理用道路、(7)洪水防御堤防、(8)沈砂池、および(9)末端圃場整備（モデルサイト）である。

1.2 対象地域の状況

事業対象地域は、本事業計画の水源となるアタリ川をはさんでブランブリ県（左岸）とクウェーン県（右岸）に跨っている。本事業地区では、過去に NGO がアタリ川に建設した小規模な取水施設を利用して主としてクウェーン県側において灌漑農業が行われている。灌漑は、「アタリ川→取水施設→幹線水路→2次水路→圃場水路」の経路で実施している。しかし、取水施設のゲートは故障し半閉状態なため、灌漑期はゲートの前に草や木を積み上げて河川の水位を上げて取水を行っている。

また、水路は全て土水路であり、幹線水路や2次水路でも水路内の水位を高く維持するため、草や木の現地資材や土嚢を利用している。そのため、漏水が多く安定的に適切な水量を配分することが困難な状況である。

現時点でブランブリ県およびクウェーン県とも灌漑農業にかかる組織的な活動はなく、施設管理や水管理は個々の農家レベルで行っている。さらに、アタリ川という同じ水源と利用しているにも関わらず、これまで両県で水配分状況について協議を行うなどの機会はない。また、水管理のルールがないため、地区の下流や水路から離れた農家は灌漑用水の十分な利用が難しく、農家間で水配分に不均衡が生じている。

洪水時期は8月～10月であり、国道を挟んだ上流側地域ではアタリ川の氾濫、受益地の下流地域では洪水と下流の湿地部分での背水による湛水が発生することがある。

1.3 対象地域の課題

本事業の効果が持続的に発現されるためには、適切な灌漑排水機能を実現するための灌漑施設の建設、ならびに灌漑施設の操作・維持管理を適正に行うための組織体制の確立と技術の習得が必要である。事業対象地域における課題は、以下の通りである。

項目	内容
取水施設の整備	アタリ川の水をブランブリ県側とクウェーン県側とへ適切に配分するため、河川の水位を安定させて、所定の水量を分水する機能を持つ取水施設を建設する。
灌漑排水施設等の整備	安定的な分水機能の確保に向けて、水位調整ゲートや分水ゲートを有する水路網や排水路の整備、並びにそれに伴う基盤を整備する。また灌漑排水施設の定期点検や維持管理、圃場へのアクセス向上のために農道（維持管理用道路）を整備する。
堤防の整備	洪水による受益地内への影響を防御するため堤防を整備する。
地方政府職員（県農業技官）の運営維持管理能力の向上	施設の持続的な維持管理や公平な水配分の実現に向け、これらの役割に責任を持つ農家に対して地方政府職員（県農業技官）が技術指導を行えるよう、灌漑施設の運用維持管理に関する地方政府職員（県農業技官）の能力向上を図る。特に、本事業は一つの取水工をブランブリ県およびクウェーン県の両県で利用するため、各県の地方政府職員（県農業技官）の能力を均等に向上し、両県を一つの組織体制として活動する基礎を作る。

項目	内容
灌漑施設の操作・維持管理 ルールの整備	農家間での水配分の不均衡の解消や灌漑施設の適切な運用を行うため、水路別の水配分マップや灌漑施設の維持管理マニュアル等を整備する。なお、現在はアタリ川から取水するための水利権は取得していない状況である。このため、事業整備実施後は、水環境省 (Ministry of Water and Environment : MWE) から承認を受けた水利権に基づき取水を行うこととなる。

1.4 ソフトコンポーネント実施の必要性

前述の通り、ブランブリ県・クウェーン県とも灌漑農業に関する組織的な活動はなく、施設管理や水管理は個々の農家レベルで行っている。さらに、同一水源にも関わらず、両県で水配分状況について協議を行うなどの機会はない。水管理のルールがないため、地区の下流域や水路から離れた農家は灌漑用水の適切な利用が難しく、農家間で水配分に不均衡が生じている。

こうした状況下、ウガンダ国では、灌漑施設の操作・維持管理は水利組合が行うこととなっており、本事業の実施機関である農業畜産水産省 (Ministry of Agriculture, Animal Industry and Fisheries : MAAIF) は、水利組合運営に係る監督および技術支援をその所掌業務としている。他方、現在のところ、同国において水利組合の登録にかかる行政手続き、および行政による運営指導体制は整備されていない。

ブランブリ県とクウェーン県においては、MAAIF と連携して農家に対し農業技術支援を行う農業技官および農業普及員が配属されている。また、両県では選挙で選ばれた裨益農家代表者により構成される事業地区住民委員会 (Project Area Coordination Committee : PACC) が設立されており、F/S 時より本事業への協力を行ってきている。今後、PACC が県農業技官や MAAIF の技術支援を受けて灌漑施設の維持管理を担う水利組合の母体を担うことになる。

以上の状況から、PACC による灌漑施設の操作や維持管理体制の強化を図るべく、県農業技官・農業普及員および MAAIF 職員らの、灌漑施設の操作・維持管理技術、水管理技術および水利組合運営方法等に関する能力を向上することが、本事業の効果発現、持続可能な利用を確かにするうえで必要不可欠と判断される。さらに、当該地区には十分な灌漑施設が存在しないため、日本人専門家によって灌漑施設の適切な運用方法や維持管理手法を指導する意義は非常に高い。

2. ソフトコンポーネントの目標

事業効果の持続的な発現には、農家自身が整備後の灌漑施設の運営維持管理を適切に行えるようになることが重要である。そのため、地方政府職員が農家に対して技術指導ができるようになることが必要である。そこで、本ソフトコンポーネントでは、県の農業技官が農家に対して、(1) 灌漑施設の運営維持管理にかかる指導、(2) 水管理にかかる指導、等を行うために必要な知識と技術を習得することを目標とする。

3. ソフトコンポーネントの成果

上記に示すソフトコンポーネントの目標を達成したことによる二つの成果と活動は、以下の通りである。

(1) 灌漑施設の操作・維持管理技術の向上

成果 1 : 新しい灌漑施設の操作・維持管理規則が明文化され、農家を含む関係者に周知される

<活動>

・対象地区の一部における水利用者区分図の整備

末端圃場整備で建設するモデルサイトを活用し、対象水路における灌漑範囲を特定する作業を通じて、水使用者区分図（用水系統図）を作成し、公平な水配分の実現に向けた基礎情報を整理する技術を指導する。日本人専門家は、県農業技官と MAAIF 職員が、水使用者区分図（用水系統図）を作成することを支援する。

・ 対象地区の一部における水利用者リストの作成

前述のモデルサイトの水路を対象として、水利用者リストの作成を通じて、灌漑用水を適正に配分するのに利用可能な基礎情報を収集する技術を指導する。日本人専門家は、県農業技官と MAAIF 職員が、水利用者リストを作成することを支援する。

・ 灌漑の目的と意義の説明

農家に対して灌漑の目的と意義を説明し、灌漑を行うことの利点や留意点について理解を図るよう指導する。日本人専門家は、灌漑目的と意義に関する研修資料を県農業技官と MAAIF 職員を支援して作成し、研修資料を用いて農家への説明の支援を行う。

・ 農家の活動を定義した規約の整備

灌漑施設を適切に運用するための方法について、農家が日常的に活動すべき事項に関する規約を作成する。日本人専門家は、県農業技官・MAAIF 職員とともに協議を進めながら、規約の作成支援を行う。

・ 農家への規約の説明

規約に関する農家への説明会を開催し、灌漑施設を利用するに際して、農家自身が行う活動に関する技術を指導する。日本人専門家は、農家を対象とした説明会において、県農業技官らによる規約の説明が円滑に行われて理解が図られるよう、技術的な活動内容についての説明支援を行う。

(2) 水管理にかかる技術の向上

成果 2：農家自らが日常的な水管理活動を行えるようになる

<活動>

・ 灌漑施設の操作・運営維持管理マニュアルの整備

適正な水管理の実施には、期別の灌漑計画の理解や灌漑施設の継続的な維持管理が欠かせない。そこで、灌漑計画に基づく適正な水の配分方法や、水路やゲートなどの定期的な維持管理に関するマニュアルを作成する。日本人専門家は、県農業技官や MAAIF 職員との協議を進めながら、頭首工から 3 次水路に至るまでの一連の施設についての技術マニュアルの作成支援を行う。

・ 農家への灌漑施設操作・維持管理マニュアルの説明会の開催

前述のマニュアルを活用し、農家が灌漑施設の適切な操作・維持管理を行うための説明会を開催する。日本人専門家は、県農業技官らが農家に対してマニュアルを説明する際の支援を行う。

・先行地区への視察の実施支援

先導的な灌漑地区への視察研修を通じて、適正な水配分のための灌漑システムの理解や施設維持管理の重要性についての事例を学ぶ。視察先はドーホ灌漑地区であり、実際の灌漑事例を視察することで、水利組合（Water Users Association : WUA）の役割、水管理ルール、維持管理方法などに対する理解を深める。視察には、日本人専門家も同行し、ドーホ灌漑地区で行われている活動の技術的説明支援のほか、視察先の農家との意見交換開催の支援等を行う。

・運営維持管理に関する実地訓練の実施

灌漑スケジュールに応じた取水工ゲートの操作方法、および公平な水配分を行うための水路沿いの分水工ゲートの操作方法に関する技術指導を行う。また、用水路、排水路、および沈砂池等における土砂の浚渫、ならびに道路や堤防における簡易な補修技術の指導を行う。日本人専門家は、県農業技官・農業普及員、PACC を中心とする農家組織、および MAAIF 職員を対象として、各ゲートの操作方法や簡易な補修技術指導を行う。

・対象地区の一部における末端圃場整備モデルサイトの圃場内水路工事に関する実地訓練の実施

末端圃場整備のモデルサイトを活用して、圃場内水路工事に係る土水路の工事および維持管理に関する技術指導を行う。末端圃場における圃場内水路は、用水を適切に配水するために重要な施設である。そのため、土水路工事と維持管理に関する研修は、これらの施設の配置計画や工事指導をする県農業技官と施設の管理主体となる農家メンバーを対象に行う。日本人専門家は、各県ごとに1箇所モデルサイトを選定し、末端圃場整備計画と水路建設工事に係る研修を現地で行う。

・実地訓練を通じて得られた教訓を踏まえたマニュアルの改定

実地訓練を通じてゲート操作や施設維持管理に関する教訓を収集し、それらを灌漑施設の操作・維持管理マニュアルへ反映して最終化を図る。マニュアルの改定作業は、日本人専門家が支援のもと、県農業技官によって実施されるものとする。

4. 成果達成度の確認方法

成果達成度の確認方法を以下に示す。成果の達成度は、下表に示す指標により確認する。

(1) 灌漑施設の操作・維持管理技術の向上

成果	指標	確認方法
新しい灌漑施設の操作・維持管理の必要性が、農家を含む関係者に周知される	対象地区の一部において水利用者区分図が整備される	水利用者区分図の確認
	対象地区の一部において水利用者リストが作成される	水利用者リストの確認
	農家の活動を定義した規約が整備される	規約の整備 農家への規約の配布確認
	農家を対象として灌漑施設の運営維持管理に関する説明会が開催される	説明会の記録（議事録、参加者リスト）

(2) 水管理にかかる技術の向上

成果	指標	確認方法
農家自らが日常的な水管理活動を行えるようになる	灌漑施設の運営維持管理マニュアルの整備	マニュアルの製本
		農家への規約の配布確認
	頭首工、用水路における適正なゲート操作技術の習得	適正な配水量のためのゲート操作の確認
	用水路、圃場内水路、沈砂池、排水路、道路、堤防の維持管理技術の習得	維持管理の技術がマニュアルに従って実施されているかを確認
	対象地区の一部における末端圃場整備計画、および圃場内水路工事技術の習得	圃場内水路の工事がマニュアルに従って実施されているかを確認
	農家を対象とした水管理技術作業の実施	作業の記録（作業場所、日時、参加者リスト等）

なお、本事業が対象とする用水路は3次用水路までであるが、事業地区の一部において末端圃場整備（モデルサイト）を実施する計画である。そのため、将来的には、本事業で整備されない末端圃場についても県農業技官の指導の下、農家グループ自身で整備を行うことを想定し、末端圃場整備の計画や圃場内水路の工事や維持管理技術についても習得を行う。

5. ソフトコンポーネントの活動（投入計画）

ソフトコンポーネントの各活動は、下記の要領にて実施する。

活動名	対象者				活動内容
	MAAIF	各県の農業技官	農家組織	MWE	
灌漑施設の操作・維持管理技術の向上	◎	◎	△		(1) 水利用者区分図の作成支援
	◎	◎	△		(2) 水利用者リストの作成支援
	◎	◎	△	○	(3) 灌漑の目的と意義の説明支援
	◎	◎	△		(4) 規約の作成支援
	○	◎	△	△	(5) 農家への規約の説明支援
水管理技術の向上	○	◎	△		(1) 灌漑施設の操作・維持管理マニュアルの作成支援
	○	◎	△	△	(2) 農家へのマニュアルの説明支援
	◎	◎	△	△	(3) 先行地区（ドーホ灌漑）への視察の実施支援（MAAIF職員、MWE職員、県農業技官・農業普及員、農家グループ幹部、ゲート操作技術者の20～30名を想定）
	○	◎	○	△	(4) 灌漑施設の操作・維持管理に関する実地訓練（用水路、ゲート操作、圃場内水路、沈砂池管理等）の実施支援
	○	◎	○		(5) 末端圃場整備（モデルサイト）の圃場内水路工事に関する実地訓練の実施支援
	○				(6) 実地訓練を通じて得られた教訓を踏まえたマニュアルの改定支援

◎：主たる指導対象者、○：副指導対象者、△：参加者

6. ソフトコンポーネント実施リソースの調達方法

ソフトコンポーネントの実施担当者は、灌漑排水施設の操作・維持管理活動の経験があり、農家グループの状況を客観的に把握し評価できる分析能力、規約やマニュアル等の文書作成能力等を有する必要がある。また、政府職員や農家をソフトコンポーネント活動に積極的に関与させるための能力、実際に灌漑施設を操作・維持管理する人材への研修を計画・実施できる企画力等を備えている人材が望ましい。

さらに、ソフトコンポーネントは、本体工事に並行して実施されるため、本体工事の施工業者、施工監理コンサルタントと柔軟な調整が出来る人材が不可欠である。そこで、活動には邦人コンサルタントを1名派遣し、現地のカウンターパートと共同で実施することとする。

また、研修は英語ではなくて現地語で実施することから、マニュアル作成や研修開催に際して邦人技術者を支援する通訳兼ファシリテーター1名を傭人する。

ソフトコンポーネントの要員について、求められる経験と主な担当業務を以下に示す。

(1) 邦人技術者：1名

当該技術者は、本事業で導入する灌漑施設が適正に運用されるとともに、灌漑施設を持続的に運営維持管理していくための技術支援を行える人材を想定している。灌漑施設の運営維持管理マニュアルは、先方政府や農家の技術状況や要望を踏まえ、農家グループ自身が活用可能で実践的なものとなる必要があることから、カウンターパートとともに現状や過去の教訓を活用し、研修スケジュールや研修資料の作成を行ってソフトコンポーネントの実施体制を整える。

(2) カウンターパート：4名

邦人技術者を支援するカウンターパートは、邦人との各活動における共同作業を通じて、将来の水利組合設立や灌漑技術の向上を目指す人材を配置する。カウンターパートは、本地区の県境に位置するアタリ川の水をクウェーン県とブランプリ県へ公平に配分する重責を担うことから、両県の水配分の調整や主要施設の維持管理等を担う MAAIF の本省（無償本体事業の C/P）と実際の水配分を監督する両県の農業技官、および MWE ムバレ事務所（灌漑技官）の参加を想定して全4名を計画する。

(3) ローカルリソース：1名

邦人技術者を支援するローカルリソースとして、通訳兼ファシリテーター1名を想定する。事業対象地域は、複数の言語が用いられていることから、通訳兼ファシリテーターとともにこれらに対応可能な人材を活用する。

項目	活動	活動内容詳細	工事2年目	工事3年目
			邦人 (日)	邦人 (日)
業務準備 (現地)	準備作業	先方政府との実施内容協議、スケジュールの作成	4.0	4.0
		ローカルスタッフの雇用	3.0	

項目	活動	活動内容詳細	工事2年目	工事3年目
			邦人 (日)	邦人 (日)
灌漑施設の運営 維持管理技術の 向上	(1)-1 灌漑土地利用図の作成支援 (ブランプリ県)	一部範囲での灌漑土地 利用図の作成	18.0	
	(2)-1 水利用者リストの作成支援 (ブランプリ県)	一部範囲での水利用 者リストの作成		
	(1)-2 灌漑土地利用図の作成支援 (クウェーン県)	一部範囲での灌漑土地 利用図の作成	18.0	
	(2)-2 水利用者リストの作成支援 (クウェーン県)	一部範囲での水利用 者リストの作成		
	(3) 灌漑の目的と意義の説明支援	灌漑に関する説明	7.0	
	(4) 規約の作成支援	各農家の役割に関す る取り決め	6.0	
	(5) 農家への規約の説明支援	農家への説明会の実 施	2.0	
水管理にかかる 技術の向上	(1) 灌漑施設の運営維持管理マニュアルの作成支 援	新設される灌漑施設 のマニュアルの策定		15.0
	(2) 農家へのマニュアルの説明支援	マニュアルに関する 説明		3.0
	(3) 先行地区 (ドーホ灌漑) への視察の実施支援 (地方政府職員、農家グループ幹部、ゲート 操作技術者、MAAIF 職員、MWE 職員の 20~ 30 名を想定)	灌漑施設を共同利用 する先行地区への視 察		7.0
	(4) 運営維持管理に関する実地訓練 (用水路、ゲ ート操作、圃場内水路、沈砂池管理等) の実 施支援	マニュアルを用いた 灌漑施設操作と維持 管理の実地訓練		7.0
	(5) 末端圃場整備の圃場内水路工事に関する実施 訓練の実施支援	圃場内水路工事にお おける実地訓練	7.0	
	(6) 活動を通じて得られた教訓を踏まえたマニ ュアルの改定支援	実地訓練を踏まえた マニュアルの最終化		4.0
合計 (日)			47.0	58.0
現地日数合計 (日) *			63.0	78.0
合計 (MM)			(2.10MM)	(2.60MM)

*) 現地日数合計=合計(日) × (1 / (22/30)) =合計(日) × 1.36

7. ソフトコンポーネントの実施工程

ソフトコンポーネントの開始は、取水施設の工事完了後を目安とし、一部地域 (末端圃場整備のモデルサイト建設を行う 12ha の地域) を対象に水利用者区分図作成支援や水利用者リスト作成支援を開始する。

また、灌漑施設を利用した実地訓練や先行地区への視察等は、全体の工事完了の 3ヶ月前から行う。

第 1 回目 : 2021 年 5 月 ~ 2.10 ヶ月間

第 2 回目 : 2022 年 4 月 ~ 2.60 ヶ月間

8. ソフトコンポーネントの成果品

ソフトコンポーネントの成果品として、以下の資料を取りまとめ、ウガンダ国政府に提出する。

- ・ソフトコンポーネント完了報告書
- ・灌漑土地利用図 (一部範囲)

- ・水利用者リスト（一部範囲）
- ・灌漑施設の運営維持管理マニュアル
- ・農家の活動を定義した規約

9. ソフトコンポーネントの概略事業費

項目	金額（円）
(1)直接人件費（4.70MM）	3,562,600
(2)直接経費	6,641,864
(3)間接費	7,410,208
ソフコン合計 ((1)+(2)+(3))	17,614,672

10. 相手国側の責務

10.1 相手国政府・実施機関や地域住民の責務となる継続的な取り組み

ソフトコンポーネント実施時には、ブランプリ県農業技官（および農業普及員）、クウェーン県農業技官（および農業普及員）、MAAIF 本省職員、MWE の地域事務所職員の各職員が参加できるように調整を図る。また、研修実施の日程や参加者の調整を行う。さらに、ワークショップやミーティング開催の手続き、運営、調整を行う。

10.2 実施の可能性

灌漑の必要性については、各県農業技官、MAAIF 本省職員ともに十分に認識している。また、農家組織においても、本ソフトコンポーネントとの両輪で進む水利組合設立支援により、一層の相乗効果が図れるものと判断する。

10.3 想定される阻害要因

灌漑施設の操作・維持管理は、農家組織（水利組合）が実施していくことから、持続的な管理にはソフトコンポーネントを通じた技術のみならず、灌漑施設の修理等に必要予算の手当ても必要となる。当面は、灌漑施設の修理に必要な予算は、MAAIF によって行われるものとし、定期的な維持管理を行っていくことが求められる。

10.4 阻害された時にとるべき必要な措置等

ソフトコンポーネントの実施主体となるのは、各県の技術系職員である。本地区では、調査期間中から、PDCC*)メンバーの一員として活動してきた職員であり、事業の持続的な運営には必要不可欠である。したがって、現地で主体的に活動する両県の農業技官を支援するべく、MAAIF のみによる支援が不十分な場合は、取水施設といった比較的大きな灌漑施設は MWE による予算支援措置を行うことが求められる。

*) PDCC :

Project District Coordination Committee (県調整委員会) : 本事業を円滑かつ成功に導くためにブランプリ県、クウェーン県双方に設立された組織である。構成メンバーは、本事業に必要な技術や専門的な知見を有する技術系職員からなり、2015年に設立された。PDCCを構成する技術系職員は、MAAIF や MWE 等の中央省庁へのレポートラインに位置するが、勤務地や給与支払い元は県政府である。本事業の PDCC は、農業、灌漑、環境、土地、ジェンダーなど専門技術者から構成されている。



Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)
Ministry of Water and Environment (MWE), UGANDA

**THE PROJECT ON
IRRIGATION SCHEME DEVELOPMENT
IN CENTRAL AND EASTERN UGANDA**

**ATARI IRRIGATION SCHEME
DEVELOPMENT PROJECT (F/S)**

ANNEX III-8

**ENVIRONMENTAL IMPACT ASSESSMENT
AND
DRAFT ABBREVIATED RESETTLEMENT ACTION
PLAN**

FEBRUARY 2017

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
NTC INTERNATIONAL CO., LTD.
PASCO CORPORATION**

ANNEX III-8

Atari Irrigation Scheme Development Project (F/S)
Environmental Impact Assessment
and
Draft Abbreviated Resettlement Action Plan
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Attachment

- Attachment-1 : Environmental Checklist
- Attachment-2 : RAP Monitoring Form and TOR for External Monitoring
- Attachment-3 : Socio-Economic Survey Questionnaire Form
- Attachment-4 : Radio Announcement and Notice Poster for PCM
- Attachment-5 : Minutes of Meeting SHM & PCM for ESIA
- Attachment-6 : Minutes of Meeting MoGLSD

Units


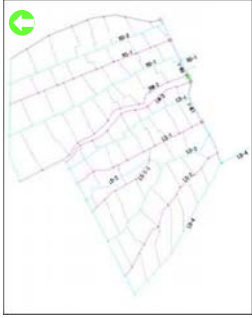
kg	kilogram
ton	Metric tons = 1,000 kg
hr	hour
mm	millimetre
cm	meter
km	kilometre
ha	hectare
HP	Horsepower
km ² , sq.km	square kilometre
m ³	cubic meter
MCM	million cubic meters
MSL	Mean Sea Level
MW	mega Watt
LPS, l/s	liters per second
mm/month	millimetre per month
mm/d	millimetre per day
m/s	meter per second
m ³ /s	cubic meter per second
°C	degrees centigrade
%	percent
US\$	United States of America Dollar
UGX	Uganda Shillings
¥	Japanese Yen

Glossary of Acronyms

ALT-L	Alternative Alignment
ALT-P	Alternative Plan
ALC	Area Land Committee
ARAP	Abbreviated Resettlement Action Plan
BCG	Bacillus Calmette-Guérin (vaccine for tuberculosis (TB) disease)
BZ	Buffer Zone
CAO	Chief Administrative Officer
CBD	Convention on Biological Diversity
CBWMP	Community-Based Wetland Management Plan
CDO	Community Development Officer
CGV	Chief Government Valuer
CITES	Convention on the International Trade in Endangered Species of Wild Flora and Fauna
C/P	Counterpart
CWMP	Community Wetland Management Plan
DAO	District Agriculture Officer
DARAP	Draft Abbreviated Resettlement Action Plan
DCDO	District Community Development Officer
DDP	District Development Plans
DEO	District Environment Officer
DISO	District Security Officer
DLB	District Land Boards
DLT	District Land Tribunals
DPT	Diphtheria, Pertussis, Tetanus
DWD	Directorate of Water Development
DWO	District Wetland Officer
DWRM	Directorate of Water Resource Management
EIA	Environmental Impact Assessment
EIR	Environmental Impact Review
EIS	Environmental Impact Statement
EMA	External Monitoring Agent
EMP	Environmental Management Plan
F/S	Feasibility Study
GoU	Government of Uganda
IMA	Internal Monitoring Agent
JICA	Japan International Cooperation Agency
JST	JICA Study Team
MAAIF	Ministry of Agriculture, Animal Industry & Fisheries
MoGLSD	Ministry of Gender, Labour & Social Development
MolHUD	Ministry of Lands, Housing and Urban Development

MWE	Ministry of Water and Environment
NBI	Nil Basin Initiative
NDP	National Development Plan
NEA	The National Environment Act
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
O/D	Overall Design
O&M	Operation and Maintenance
OPV	Oral Poliovirus Vaccines
PACC	PISD Area Coordination Committee
PAP	Project Affected Person
PAH	Project Affected Household
PDCC	PISD District Coordination Committee
PISD	Project on Irrigation Scheme Development in Central and Eastern Uganda
PLC	Parish Land Committees
RAP	Resettlement Action Plan
RIC	Resettlement Implementation Committee
RDC	Resident District Commissioner
RTSUs	Regional Technical Support Units
S.O.L.	School of Open Learning
UBOS	Uganda Bureau of Statistics
ULC	Uganda Land Commission
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank
WMD	Wetland Management Department
WSSP	The Wetlands Sector Strategic Plan

Table 1.1.1 Outline of Facilities for the Irrigation Project in Atari Area

No	Facility	Outline
1	Head Work	<p>It consists of diversion weir with gates, spillway, and fish way and intake structure equipped with gates and settling basin will be provided. The width of diversion weir shall be wide enough to flush out flood discharge when the gates are fully opened. Gates will be manually operated and made of steel works and reinforced concrete.</p> 
2	Main Canal	<p>The layout of main canal will be set considering the gradient of project area, inclination of canal, location of dwelling area and existing road or boundary of plots of farmland as a rule. Where possible the alignment of the main canal shall be kept as straight as possible to avoid too many corners and reduce loss in flow (hydraulic) energy. Main canal route will be selected at highest location taking the gradient of canal into consideration.</p>
3	Secondary Canal	<p>Secondary canal shall be lined with proper materials such as concrete so as to avoid erosion by water flow. Secondary canal shall be provided within 0.5-1.0 km intervals so as to limit lengths of tertiary canals up to 500 m long as a rule. Where possible the alignment of the secondary canal shall be kept as straight as possible to avoid too many corners and reduce loss in flow (hydraulic) energy. In the project, the fish bone type layout will be adopted taking into consideration topography and efficiency.</p> 
4	Tertiary Canal	<p>Size of farmland for tertiary network system shall be about 10 ha as a rule. Tertiary canal shall not be lined with concrete material. Length of tertiary canal for each block shall be limited to 500 m at most.</p>

Source: JICA Study Team

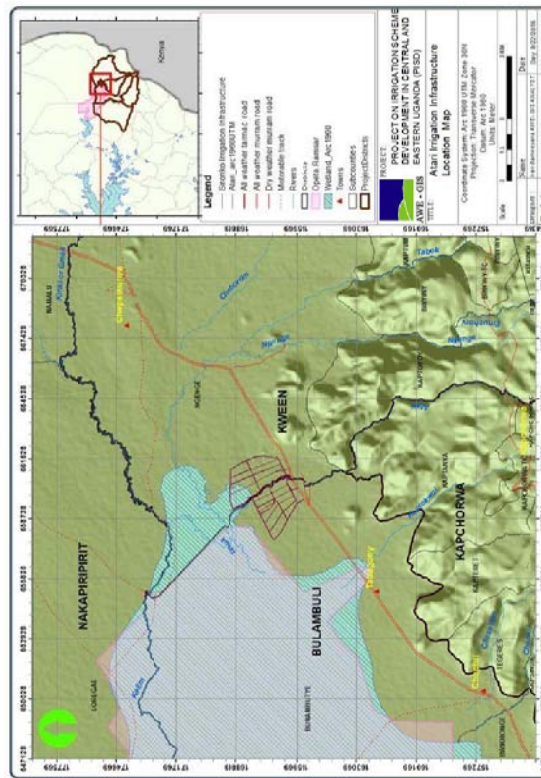
Impacts caused by the project before/during construction and operation phases were examined and mitigation measures were developed through the environmental impact assessment (EIA).

Chapter 1 ENVIRONMENT AND SOCIAL CONSIDERATIONS

1.1 Environment and Social Considerations

1.1.1 Outline of Project Component to Give Impact on Environmental and Social Aspects

The irrigation project installs facilities for sound farming in the Atari area such as head work and canals. Construction of these facilities and their operation can be factors to give impacts on the environmental and social aspects. Figure 1.1.1 illustrates the location of the project area and outline of the irrigation facilities installed is show in Table 1.1.1.



Source: JICA Study Team

Figure 1.1.1 Location of Atari Project Area

1.1.2 Fundamentals of Environment and Social Conditions

(1) Environmental Condition

1) Climate

Uganda has a tropical climate with rainy and dry seasons. According to the “Hydro-Climatic Study Report on the Water Resources of Uganda (2010)” by DWRM analysis of monthly rainfall records at 102 rain gauges for the period 1940-75 were classified into 16 climate zones. Atari project area is located in zone F it is assumed that there is virtually one rainy season from March to October, with the main peak in April and a secondary peak in August and one dry season December to about mid March, as shown in Table 1.1.2.

Table 1.1.2 Summary of Monthly Meteorological Data for Atari Project Area

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total or Average
Temperature (°C)	24.1	24.7	24.5	23.8	23.6	22.7	22.4	22.6	23	23.4	23.1	23.5	23.4
Relative Humidity (%)	62	58	65	70	72	69	68	70	69	70	71	65	67
Rainfall (mm)	81	69	145	212	215	103	87	123	118	172	158	85	1566
Sunshine hours (hr)	9.2	8.1	8	6.9	7.5	7.6	6.5	6.8	7.7	7.6	7.3	8.3	7.6
Evaporation (mm)	5.9	6.1	6.1	5.3	4.4	4.5	3.8	4.2	5	5	5.2	5.6	5.1

Source: JICA Study Team based on the data from Uganda National Meteorological Authority

Monthly mean maximum temperature is 31.9 °C in February, while the monthly mean minimum temperature is 16.4 °C in August. The annual difference of mean temperature is 3.5 °C. Humidity is minimum, 57.6 % in February and maximum, 72.0 % in May. Maximum sunshine hours are about 9.2 hours in January and minimum sunshine hours is about 6.5 hours in July.

Annual rainfall ranges from 1,048 mm to 1,992 mm and the average annual rainfall is about 1,566 mm in accordance with the data of Tororo meteorological Station. Pan-evaporation data show their highest value of 6.1 mm during February and March, and a minimum of 3.8 during July. According to the progress report developed by MWE, the annual mean pan evaporation is 1,853 mm. The value exceeds annual mean rainfall in the study area, thus justifying the requirement for irrigation to supplement crop water requirements.

2) River and Water Body

There is a single river system in the project area. Atari Riverside Basin which lay its stream channel straight from mountainous area of Mt. Elgon National Park (around Piswa area near to the peak Muzos; 3,338 m) and forwards to confluence point with Kelim River which flows into the Lake Opeta (Awoja Wetland System). A tributary of the Atari River, the Tabok River which emerges from the same Mt. Elgon National Park and passes through another project site of Ngeenge River Basin (Kween district), joint in the Atari River approximately 1.5 km downstream from the lower end (at position of drainage culvert) of the planned scheme of Atari Riverside Basin.

Water resources for this area are Atari River with catchment area of 112 km². Within a part of the area, 450 ha of paddy planting is precised so far, but acreage is rather small and restricted compared with its potential. As for existing intake facilities at Atari River, irrigation water is drawn from the rivers through weir made of reinforce concrete installed by NGO. However, lower parts of gates are corroded and hoisting devices are out of functioning.

The Atari River flows in the direction of south to north from halfway up the Mt. Elgon region as the origin then the flow enters into study area. The Atari River flows into the Kelim River and finally reached to the Lake Opeta.

3) Topography and Geology

The topography of the project area, generally, is characterized as flat plain relief dissected by rivers emerging from the mountainous area and flowing toward low-lying area of Awoja Wetland system. The area has mainly two types of soils, i.e., loam and sandy loam soils that are mainly accumulated around seasonal swamps where major agricultural activities are precised. These soils are greatly in favor of the growth of pastures for livestock and growth of agricultural products.

4) Soils

The soils in the project area are mainly luvisols and vertisols characterized with a reddish colour and heavily textured. The soils have moderate-high productivity in terms of agricultural production. However, the soils are also susceptible to runoff and logging due its looseness and poor infiltration rates. The above properties make these particular soils not ideal for construction and hence they will need to be stabilized during implementation. Based on the particle size distribution, majority of the soil particles ranges between 180 µm to 2 mm which is above 100 µm that is considered susceptible to erosion.

5) Vegetation

The vegetation cover of the area is characterized as scattered trees, tall grass and shrubs. In several areas the vegetation has degenerated into secondary vegetation. The major contributing factor is human deliberate activities like animal grazing, construction, cutting of grass and trees for firewood and bush burnings.

The most important and natural vegetation are Wooded Grassland and seasonally flooded grassland. There are also patches of permanent wetland. The wetlands are critical in maintaining a link with the Ramsar Sites of Bisina and Opeta downstream.

(2) Social Condition

Table 1.1.3 and Table 1.1.4 show summaries of social condition in Bulambuli and Kween and districts respectively, to which the project area belongs.

Table 1.1.3 Summary of Social Condition in Bulambuli District

County	No. S/C	No. parishes/wards	No. villages/zones/cells
Bulambuli	19	98	1,193
Total	19	98	1,193

Selected characteristics	Values	Selected characteristics	Values
Surface area (Sq.km)	648	Deprivation of a decent S.O.I.	41.50
Total population (2014 provisional result)	177,322	Poverty head county	34.68
Average Dependency ration	123.6	Adult literacy level	61.50
Life expectancy	56.08	Population growth rate	2.5

MDG indicator	Rate/Ratio	MDG indicator	Rate/Ratio
Primary school net enrollment rate	146	Secondary school gross enrollment rate	39
Primary school gross enrollment rate	167	Pupil teacher ratio	55
Secondary school net enrollment rate	56	Pupil classroom ratio	76

Table 4: Education enrolment by gender Source: Ministry of education 2012	
	Male
Primary schools enrolment	21,168
Secondary school enrolment	2,987
Total	24,155

Table 4: Education enrolment by gender Source: Ministry of education 2012	
	Female
Primary schools enrolment	21,737
Secondary school enrolment	2,667
Total	48,572

Table 5: Availability of facilities Source: Ministry of health 2011				
Facility	GOVT	NGO	Private	Total
HOSPITAL	0	0	0	0
HC IV	1	0	0	1
HC III	8	1	0	9
HC II	6	1	0	7
Total	15	2	0	17

Table 6: Point water sources Source: Ministry of water and environment 2010				
Source	Functional	Non functional		
Protected spring	243	16		
Shallow wells	47	12		
Deep boreholes	49	5		
Rainwater harvesting	7	0		
Access to safe water %	73	-		

Table 7: District routine immunization rates by type of diseases Source: Ministry of health 2012/13				
Antigen	Percentage (%)	Antigen	Percentage (%)	
BCG	104.5	OPV 3	99.9	
Measles	125.8	DPT 3	98.3	

Table 8: District population 2014 Source: 2014 census provisional result, UBOS					
Sub County / Division/ Town Council	2014			Poverty Headcount	
	Male	Female	Total		
BUGINYANYA	2,819	2,711	5,530	30.3	
BUKHALU	12,429	13,244	25,673	35.3	
BULAGAGO	4,817	4,639	9,456	35.3	
BULAMBULI T.C.	2,504	2,572	5,076	31.6	
BULEGENI	2,163	2,307	4,470	31.6	
BULUGENI T.C.	4,962	6,129	11,091	34.7	
BULUGANYA	4,412	4,539	8,951	32.0	
BUMASOBO	4,113	4,009	8,122	31.0	
BUMUGIBOLE	3,419	3,278	6,697	30.3	
BUNAMBUTYE	4,405	4,143	8,548	42.7	
BWIKHONGE	3,884	3,999	7,883	43.0	
KAMU	2,913	3,336	6,271	31.6	
LUSHA	7,291	8,188	15,479	30.0	
MASIRA	4,832	4,938	9,770	37.2	
MUYEMBE	3,797	3,993	7,790	30.0	
NARONGO	4,789	4,811	9,600	35.0	
NAMISUNI	4,078	4,689	8,767	32.0	
SIMU	1,917	3,154	5,371	34.0	
SISIVI	6,293	6,484	12,777	34.0	
DISTRICT	85,837	91,485	177,322	34.7	

Source: JICA Study Team

Table 1.1.4 Summary of Social Condition in Kween District

Table 1: Number of administrative units by county and Sub County Source: Uganda bureau of statistics				
County	No. S/C	No. parishes/wards	No. villages/zones/leells	
Kween	12	66	481	
Total	12	66	481	

Table 2: General indicators Source: Uganda bureau of statistics				
Selected characteristics	Values	Selected characteristics	Values	
Surface area (Sq km)	791	Deprivation of a decent S.O.L	24.8	
Total population (2014 provisional result)	95,623	Poverty head county	37,90	
Average Dependency ration	115.8	Adult literacy level	54	
Life expectancy	60.21	Population growth rate	4.2	

Table 3: Key MDG indicator for Education Source: Ministry of education 2012				
MDG indicator	Rate/ Ratio			
Primary school net enrollment rate	116			
Primary school gross enrollment rate	137			
Secondary school net enrollment rate	29			
Secondary school gross enrollment rate	32			
Pupil teacher ratio	50			
Pupil classroom ratio	51			

Table 4: Education enrollment by gender Source: Ministry of education 2012				
	Male	Female	Total	
Primary schools enrollment	14,527	14,984	29,511	

Table 5: Availability of facilities Source: Ministry of health 2011				
Facility	GOVT	NGO	Private	Total
HOSPITAL	0	0	0	0
HC IV	1	0	0	1
HC III	8	1	0	9
HC II	6	1	0	7
Total	15	2	0	17

Table 6: Point water sources Source: Ministry of water and environment 2010				
Source	Functional	Non functional		
Protected spring	243	16		
Shallow wells	47	12		
Deep boreholes	49	5		
Rainwater harvesting	7	0		
Access to safe water %	73	-		

Table 7: District routine immunization rates by type of diseases Source: Ministry of health 2012/13				
Antigen	Percentage (%)	Antigen	Percentage (%)	
BCG	104.5	OPV 3	99.9	
Measles	125.8	DPT 3	98.3	

Table 8: District population 2014 Source: 2014 census provisional result, UBOS					
Sub County / Division/ Town Council	2014			Poverty headcount	
	Male	Female	Total		
BENET	5,639	11,314	5,675	36.9	
BINYINY	2,516	2,568	5,084	38.3	
BINYINY T.C.	1,755	1,821	3,576	37.9	
KAPORON	3,163	2,585	5,747	40.4	
KAPTOYDI	4,142	4,294	8,436	40.4	
KAPTOM	4,690	4,778	9,468	40.0	
KIRIKI	2,417	1,981	4,398	33.0	
KITAWOI	3,855	4,051	7,906	37.0	
KWANVINY	5,190	5,139	10,329	39.2	
KWOSIR	6,126	6,284	12,410	37.0	
MOYOK	2,877	2,904	5,781	39.0	
NGENGE	6,210	4,964	11,174	32.0	
DISTRICT	48,579	47,044	95,623	37.9	

Source: JICA Study Team

1.1.3 Regulation and Organization of Environment of Uganda

(I) Policy and Laws related to Environmental Considerations in Uganda

Important legal framework for environment and social considerations in Uganda mainly consists of the country's Constitution (1995), National Environment Management Policy (1995), and National Environment Act (NEA 1995). The objectives and principle of these important laws and policy are shown below.

1) Constitution of the Republic of Uganda (1995)

The national objectives and directive principles for environment indicated in the Constitution are as follows:

Chapter XXVII: The Environment

The State shall promote sustainable development and public awareness of the need to manage land, air, and water resources in a balanced and sustainable manner for the present and future generations.

The utilization of the natural resources of Uganda shall be managed in such a way as to meet the development and environmental needs of present and future generations of Ugandans; and, in particular, the State shall take all possible measures to prevent or minimize damage and destruction to land, air, and water resources resulting from pollution or other causes.

The State shall promote and implement energy policies that will ensure that people's basic needs and those of environmental preservation are met.

The State, including LGs, shall

- create and develop parks, reserves, and recreation areas and ensure the conservation of natural resources;
- promote the rational use of natural resources so as to safeguard and protect the biodiversity of Uganda.

2) National Environment Management Policy (1995)

The overall policy goal is sustainable social and economic development which maintains or enhances environmental quality and resource productivity on a long-term basis that meets the needs of the present generations without compromising the ability of future generations to meet their own needs.

3) National Environment Act Cap. 153 (NEA) (1995)

The NEA provides for the establishment of institutional structures right from national to village levels and clearly outlines their roles and responsibilities. The institutional structures and roles are shown in Table 1.1.5.

Table 1.1.5 Roles for Each Institution on Environment and Natural Resources Management

Institution	Role
National Environment Management Authority (NEMA)	- To coordinate, monitor and supervise all activities in the field of environment in the country.
Policy Committee on the Environment	- To formulate and provide national policy guidelines on environment management.
Technical Committee on the Environment	- To give advice on subjects to the environment such as soil conservation, licensing pollution, biodiversity conservation and environment impact assessment.
District Environment Committee	- To coordinate the activities of the district relating to the management of environment and natural resources. - To ensure all environment concerns are integrated in all plans and projects approved by the district council. - To assist in the development and formulation of bylaws relating to environment and natural resources management. - To promote the dissemination of information about the environment through education and outreach programs. - To coordinate with NEMA on all issues relating to environment management. - To coordinate the activities of local environment committees in the management of the environment. - To receive reports from the local environment committees every year. - To prepare a District State of the Environment Report every year.

Source: JICA Study Team

Other legislation and policies governing the environment and social considerations are:

- The Fish Act, Cap 152 (1951);
- The Decentralization Policy (1993);
- The Wildlife Act, Cap 200 (1996);
- The Local Government Act (1997);
- The Water Act (1997);

- The Water Act, Cap 152 (1997);
- The Land Act (1998);
- Environment Impact Assessment Regulations (1998);
- The National Environment (Conduct and Certification of Environment Practitioners) Regulations (2003);
- The National Environment (Wetlands, River bank, and Lake Shores Management) Regulations (2000);
- Occupational safety and Health Act, (2006);
- The National environment (Audit) regulations (2006)

(2) International Environmental Instruments/Obligations for Uganda

Uganda is a signatory to several international instruments on environmental management as shown below.

- The African Convention on the Conservation of Nature (1968);
- The Protection of World and Cultural Heritage convention (1972);
- The Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES, 1973);
- The Ramsar Convention on wetlands of International Importance (1988);
- Convention on Biological Diversity (CBD, 1992);
- United Nations Framework Convention on Climate Change (UNFCCC, 1992);
- Nile Basin Initiative (NBI, 1999)

(3) Policy and Laws Related to Wetland

1) National Policy for the Conservation and Management of Wetlands (1995)

This policy provides the basis for management and use of wetlands in Uganda. It promotes wetland conservation and sustainable use for present and future generations. However, no legislation specific to wetlands exists at the moment. In Article 7, Specific Policy Strategies are described as follow.

7.1	Drainage of wetlands	There will be no drainage of wetlands unless more important environmental management requirements supersede.
7.2	Environmentally sound management	Only those uses that have proved to be non-destructive to wetlands and their surroundings will be allowed and/or encouraged. These include water supply, fisheries, wetland edge gardens, and grazing.
7.3	Sustainable use of wetlands	Wetlands may be utilized in such a way that they do not lose traditional benefits presently obtained from them. Any decisions to use wetlands must consider the requirements of all other users in the community.
7.4	Conversion of wetlands	Government will establish fully "Protected Wetland Areas" of important biological diversity. Government may also establish wetlands which will be used for partial exploitation as research. No modification, drainage or other impacts will be entertained for the so protected wetlands.
7.5	Water supply and effluent treatment	Any wetland serving as a source of water supply or receiving effluent as part of a designated service to any human settlement shall be fully protected wetland from any encroachment, drainage, or modification.
7.6	Tenure and use	All wetlands are a public resource to be controlled by the government on behalf of the public. There shall be no leasing of any wetland to any

person or organization in Uganda at any given moment and for whatever reason.

However, communal use will be permitted, but only if environmental conservation and sustainable use principles and strategies are adhered to.

7.7 Recovery of previously drained wetlands

Government may require that some wetlands, which have already been drained, should be allowed to regenerate. For this purpose, Government aims at restoring the soil hydration so as to re-establish the wetland vegetation as far as ecologically possible. Such an operation may range from partial rehabilitation of wetlands along drainage channel in the case of lease holder, to full rehabilitation after the lease has been cancelled or eviction in case of users with no leases.

7.8 Environmental Impact Assessment (EIA) and monitoring

There will be a requirement that all proposed modifications on wetlands be subject to an EIA.
All planned new wetland developments will be subjected to an EIA process to determine the required environmental controls.

Source: National Policy for the Conservation and Management of Wetlands (1995)

2) The National Environment (Wetlands, River Bank, and Lake Shores Management) Regulations (2000)

These regulations are important regarding irrigation development project in wetland. Related articles for the environmental assessment of the project are show as below.

5 Principles

The principles set out in this Part shall be observed in the management of all wetlands as follows:

- Wetland resources shall be utilized in a sustainable manner compatible with the continued presence of wetlands and their hydrological functions and service;
- Environmental impact assessment as required under the statute is mandatory for all activities in wetlands likely to have an adverse impact on the wetland;
- Special measures are essential for the protection of wetlands of international, national and local importance as ecological systems and habitat for fauna and flora species, and for cultural and aesthetic purposes, as well as for their hydrological functions; and
- Wise use¹ of wetlands shall be interpreted into the national and local approaches to the management of their resources through awareness campaigns and dissemination of information.

11 Uses of wetlands

A person desiring to carry out of the regulated activities listed in the Second Schedule or extract any wetland produce in a wetland shall make an application in Form A set out in the First Schedule to these regulations. Notwithstanding the provisions of sub-regulation (1), the following traditional users of wetland resources shall not be subject to the application of these regulations.

- Harvesting of papyrus, medicinal plants, trees and reeds;
- Any cultivation where the cultivated area is not more than 25% of the total area of the wetland;
- Fishing using traps, spears and baskets or other methods than weirs;
- Collection of water for domestic use; and
- Hunting subject to the provisions of the Wildlife Act Cap.200.

12 Wetland resource use permit

Subject to the provisions of Regulations, a person shall not carry out any activity in a wetland without a permit issued by the Executive Director (of NEMA).

29 Protection zones for river banks

The rivers specified in the sixth Schedule to these Regulations shall have a protection zone of one hundred meters from the highest watermark of the river.
River not specified in the Sixth Schedule shall have a protected zone of

¹ "wise use" means sustainable utilization of wetlands in a way compatible with the maintenance of the natural properties of the ecosystem.

thirty meters from highest watermark of the river.

No activity shall permit within protected zones without the written authority of the Executive Director (of NEMA).

Each local environment committee shall determine watering points and routes for animals to have access to the water in each river.

In Article 11 (2) (b), cultivation less than 25% of the total area of the wetland is allowed, however, the area of "the total area of the wetland" is not clear. Actually more than 25% of wetland is already cultivated in many wetlands. Nevertheless wetland farmers who are cultivating illegally are not necessarily chased away by authorities. It because, according to DWM, burdens on wetlands should be decreased gradually with wetland users' understanding and cooperation based on the "wise-use" concept.

Rivers and lakes stipulated in sixth Schedule and seventh Schedule in Article 29 and 30 are shown in Table 1.1.6. Width of protection zone for rivers and lakes can be assumed as a temporarily measure put in nation widely due to lack of river information for protecting river bank.

Table 1.1.6 Rivers and Lakes Stipulated in Sixth Schedule and Seventh Schedule

No	Rivers	Lakes
1	R. Nile from Lake Victoria to Lake Albert	L. Victoria
2	R. Aswa	L. Kyoga
3	R. Katonga	L. Albert
4	R. Nkusi	L. Edward
5	R. Kafu	L. George
6	R. Ruvizi	L. Bisina
7	R. Kagera	L. Mburu
8	R. Mpanza	L. Bunyonyi
9	R. Manafwa	L. Kijambaro
10	R. Mpotogoma	L. Kwana
11	R. Senliki	L. Wamala
12	R. Mubuku	L. Mutanda
13	R. Mgyanjja	L. Marebe
14	R. Sezibwa	L. Opeta
15	R. Malaba	L. Nabugabo
16	R. Sipi	L. Nkusate
17	R. Nanaala	L. Katunga
18	R. Sironko	L. Nyabihoko
19	R. Muzizi	L. Nakivale
20	R. Nabuyonga	

Source: JICA Study Team, based on the National Environment (Wetlands, River bank, and Lake Shores Management) Regulations (2000)

3) Institutional Framework on Wetlands

The Wetland Management Department (WMD) in Ministry of Water and Environment is responsible for the implementation of Uganda's Wetland Policy. The Wetlands Sector Strategic Plan 2001-2010 (WSSP) guides the activities of the WMD. The current WSSP (2011-20) is the latest version. Its goals are to increase knowledge and public and stakeholder awareness about wetlands, further develop the institutional structure for wetland management, improve management and protection, establish, and strengthen community-based wetland management, and mobilize local and international financing mechanisms.

Districts are encouraged to designate a wetlands focal point to carry out wetland activities, and they can seek support from one of the three Regional Technical Support Units (RTSUs) established by WMD to provide technical backstopping to the field for wetland management. Districts are responsible for development of District Wetland Action Plans and their integration into District Development Plans (DDPs). They are also encouraged to formulate and implement district-level ordinances and local bylaws for wetland management. Community Based Wetland

JICA Guidelines (Appendix 2. EIA Reports for Category A Projects)	Laws/regulation in Uganda (as of July 2016)	Gaps between two countries	Policy to fill up gaps in this Study
When explaining projects to local residents, written materials must be provided in a language and form understandable to them. EIA reports are required to be made available to the local residents of the country in which the project is to be implemented. The EIA reports are required to be available at all times for perusal by project stakeholders such as local residents and copying must be permitted.	Section 29 (1) of the EIA regulations states that the EIA reports submitted to the Executive Director shall be public documents. Section 29 (2) of the EIA regulations indicates that any person who desires to consult the EA Report documents, be granted access by the Authority on such terms and conditions as the Authority considers necessary.	- (no difference)	Not Required
In preparing EIA reports, consultations with stakeholders, such as local residents, must take place after sufficient information has been disclosed. Records of such consultations must be prepared.	The EIA Regulations (1998) specify that information disclosure and public meetings be undertaken as part of the EIA process. The regulations allow for a public hearing to be undertaken, if deemed necessary by NEMA. Section 12 (1) of the EIA regulations requires the developer to take all measures necessary to seek views of the people in communities which may be affected by the project during the process of conducting the study. Section 12 (2) (a) of the EIA regulations requires the developer to publicize the intended project, its anticipated effects and benefits through the mass media in a language understood by the affected communities for a period of not less than fourteen days.	- (no difference)	Not Required
Consultations with relevant stakeholders, such as local residents, should take place if necessary throughout the preparation and implementation stages of a project. Holding consultations is highly desirable, especially when the items to be considered in the EIA are being selected, and when the draft report is being prepared.	The EIA guidelines (NEMA, 1997) require public consultation during the scoping phase to determine terms of reference for the EIA, which have to be agreed by NEMA. These terms of reference must include a full list of stakeholders to be consulted during the EIA. The EIA Regulations (1998) specify that information disclosure and public meetings be undertaken as part of the EIA process. The regulations allow for a public hearing to be undertaken, if deemed necessary by NEMA.	- (no difference)	Not Required
The donor country shall check the monitoring results which are deemed important for a certain period, in order to verify whether the host country considers the environmental and social impacts. Information necessary for verifying the monitoring results shall be reported by the host country via a proper manner such as documentation etc.	Section 32 (1) An inspector designated under section 80 of the Act may, at all reasonable times, enter on any land, premises or other facility related to a project for which a project brief, or an environmental impact statement, has been made under these regulations, to determine how far the predictions made in the project brief, or the environmental impact statement, whichever the case may be, are complied with. Section 33 (1) After studying the audit report made under regulations 31 and 32, the Executive Director may require that the developer takes specific mitigation measures to ensure compliance with the predictions made in the project brief, or environmental impact statement whichever the case may be. The National Environment Act provides for environmental monitoring and impact assessment; environmental audit; environmental restoration orders and environmental improvement notices; environmental performance assessments; environmental	- (no difference)	Not Required

Management Plans (CBWMPs) are to be prepared by community groups.

However, the effectiveness of these institutions is constrained by under staffing, lack of funding and limited coordination among the different sectors involved in the management process.

(4) Gap Analysis between JICA and Uganda's EIA Requirements

Table 1.1.7 summarizes a gaps analysis between JICA and Uganda's EIA regulatory requirements. It is seen that no notable gap exists in principle objectives in regard to process, impacts to assess, stakeholder engagement and information disclosure.

Table 1.1.7 Gap Analysis between JICA and Uganda's EIA Requirements

JICA Guidelines (Appendix 2. EIA Reports for Category A Projects)	Laws/regulation in Uganda (as of July 2016)	Gaps between two countries	Policy to fill up gaps in this Study
1. When assessment procedures already exist in host countries, and projects are subject to such procedures, project proponents etc. must officially finish those procedures and obtain the approval of the government of the host country. 2. On implementing a project, in the planning stage impacts on the environmental and social aspects shall be examined as early as possible to develop alternatives or mitigation measures for mitigating or minimizing such impacts. The results obtained shall be incorporated in the project plan.	The EIA Regulations (1998) require that an EIA is undertaken. Section 25. Details the decision of the Executive Director in relation to approval of EIA. Section 26 indicates that conditions of approval of a project will be provided. Section 14 (1) of the EIA regulations describes the content of the EIS including (a) the proposed site and reasons for rejecting alternatives; (f) the technology, and processes that shall be used, and a description of alternative technologies and processes, and the reasons for not selecting them; (i) the measures proposed for eliminating, minimizing or mitigating adverse impacts.	- (no difference)	Not Required
3. In order to mitigate and minimize undesired impacts by the project on select a more desirable plan on environmental and social considerations, multiple alternatives shall be examined.	Section 14 (1) of the EIA regulations describes the content of the EIS including (b) the proposed site and reasons for rejecting alternatives; (f) the technology, and processes that shall be used, and a description of alternative technologies and processes, and the reasons for not selecting them.	- (no difference)	Not Required
4. Impacts to be surveyed and examined on environmental and social considerations includes those on human health and safety, natural environment (including trans-boundary or global impacts) and the society through air, water, soil, waste, accident, water use, climate change, ecosystem and biodiversity.	EIA is a statutory requirement for projects that are likely to have a significant impact on the environment, and the EIA Regulations (1998) specify that social issues be included and that consultation be undertaken. NEMA may require a public hearing to be held following submission of the EIS. Section 13 (2) of the EIA regulations requires the developer to pay attention to the issues laid down in the First Schedule in making an environmental impact statement. The First Schedule to the EIA Regulations (1998) lists issues that may be considered in the assessment. Section 14 (1) of the EIA regulations describes the content of the EIS including (k) an indication of whether the environment of any other State is likely to be affected and the available alternatives and mitigating measures.	- (no difference)	Not Required
5. EIA reports (which may be referred to differently in different systems) must be written in the official language or in a language widely used in the country in which the project is to be implemented.	Section 12 (2) (g) of the EIA regulations requires the developer to publicize the intended project, its anticipated effects and benefits through the mass media in a language understood by the affected	The language of the report is not specified	This EIA report is written in the official language of Uganda - English

Table 1.1.8 Summary of EIA Process in Uganda

d) Decision making by NEMA (and lead agencies).
These processes are explained in Table 1.1.8 and illustrated in Figure 1.1.3.

Process	Description
a) Project brief preparation	<p>A project brief is necessary for some development projects that are listed in the Third Schedule of the National Environment Act (NEA) Cap 153, for NEMA to determine the category of the project. This arises out of the screening process which assesses the cost or benefit of the particular project.</p> <p>The developer has the responsibility to prepare a project brief which must provide the required information given in below.</p> <ul style="list-style-type: none"> - Name and address of the developer; - Name, purpose, objectives and nature of the water project in accordance with the categories identified in the Third Schedule of the NEA; - Description of the project site and its surroundings where the project is to be located (including Global Positioning System (GPS) coordinates, village, parish, Sub County, County, and District); - Site location map; - Policies, laws, regulations governing such project; - Description of project design and activities that shall be undertaken during and after the development of the project - Description of equipment to be installed and any buildings or related facilities; - Description of the materials and input that the project shall use; - Description of the products and by-products, including waste to be generated; - Description of any likely environmental impacts of the project, and how they will be eliminated or mitigated during the implementation of various phases/stages of the project; - Description of any other alternatives, which are being considered (e.g. siting, technology, construction and operation procedures, sources of raw materials, handling of wastes etc.); and - Any other information that may be useful in determining the level of EIA required by NEMA, and Decommissioning and restoration plans for closure and restoration of the site to productive post-closure use.
b) Screening	<p>It is a requirement that any developer intending to develop a project submits a project brief to NEMA, containing a prescription of the activity being considered. The project brief shall be screened by NEMA in consultation with DWRM. The review process shall remain the same as stated in the National Environment Act Cap 153 and EIA regulations 1998. After the review, NEMA shall make a decision whether:</p> <ul style="list-style-type: none"> - The project is exempt from any further assessment through EIR or EIA and consequently; - A conditional or unconditional approval for the project shall be granted; or - Where it is envisaged that the project is likely to lead to significant impact on the environment, it shall require that an EIR or a full EIS study be carried out. <p>Water resources related projects have four screening categories such as:</p> <p>Category 1: Small projects which do not have potential significant impacts and for which separate EIAs are not required, as the environment is the major focus of project preparation. These could include borehole drilling, hand augured shallow wells, protected springs and earth reservoir construction.</p> <p>Category 2: Environmental analysis is normally unnecessary, as the project is unlikely to have significant environmental impacts. A project brief is enough. This could include project location in less sensitive areas or where many such schemes are in the same locality and their synergistic effects have potential impacts.</p> <p>Category 3: A limited environmental analysis is appropriate, as the project impacts can be easily identified, and for which mitigation measures can be easily prescribed and included in the design and implementation of the project. Projects in this category could include:</p> <ol style="list-style-type: none"> i. rural water supply, ii. large earth reservoirs, but not located in very sensitive areas iii. big gravity flow schemes iv. all category one projects located in sensitive areas.

JICA Guidelines (Appendix 2. EIA Reports for Category A Projects)	Laws/regulation in Uganda (as of July, 2016)	Gaps between two countries	Policy to fill up gaps in this Study
	<p>bonds, licensing and standard setting, use of economic and social incentives; civil and penal sanctions, including community service, among others.</p> <p>Section 77(1) requires keeping of records.</p> <p>Section 78 (1) The records kept under section 77 shall be transmitted to the authority or its designated representative annually or to be received not later than one month after the end of each calendar year.</p>		

Source: JICA Study Team

(5) Procedure of Environmental Impact Assessment

1) Responsible Organization

EIA responsible institution in Uganda is the National Environment Management Authority (NEMA). The National Environment Act (NEA), Cap. 153, stipulates the Mandate of NEMA as the principal Agency in Uganda responsible for the management of the environment by coordinating, monitoring, regulating, and supervising all activities in the field of environment. The organogram is shown in Figure 1.1.2.

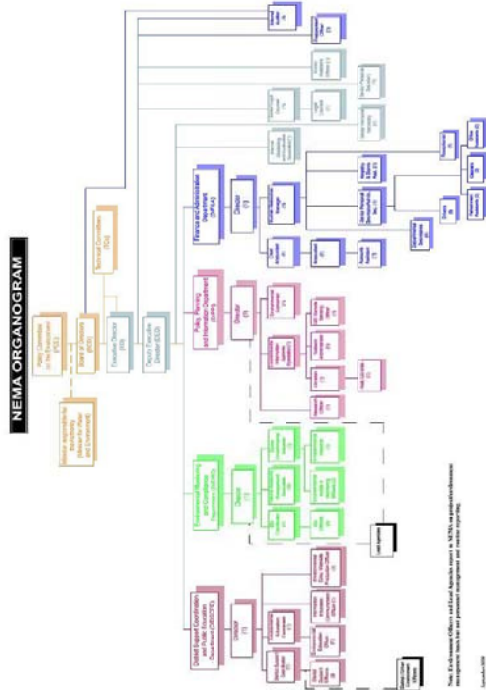


Figure 1.1.2 NEMA Organogram

2) The EIA Process in Uganda

The EIA process is summarized as follows:

- a) Project brief preparation (for projects that may not require full/ detained EIA);
- b) Screening;
- c) Detailed environmental impact study; and

Process	Description
	<ul style="list-style-type: none"> v. aquaculture; vi. small industries, and <p>Category 4: An EIA is normally required because the project may have diverse significant impacts. Projects in this category could include:</p> <ul style="list-style-type: none"> i. water projects requiring water to a level more than 400m³ in any period of twenty four hours, or projects requiring to use motorized pumps; ii. storage dams, barrages, weirs, valley tanks and dams; iii. river diversions and inter-basin water transfer; iv. flood control schemes, drilling e.g. for geothermal; v. large reservoirs; vi. irrigation and drainage schemes; vii. water use industries e.g. pulp and paper, Breweries, etc. viii. mining industry; ix. sewage treatment plants; x. small and large hydro power projects; xi. urban water supply projects; and xii. small to large gravity flow schemes. <p>The EIA process is concluded when NEMA issues an EIA Certificate of Approval to the developer after paying an appropriate fee</p>
c) Detailed environmental impact study	<p>According to the EIA Regulations 1998, EIS refers to the detailed study conducted to determine the possible environmental impacts of a proposed project and measures to mitigate their effects. The detailed EIS process is shown in Table 1.1.9.</p>

Source: JICA Study Team

3) Environmental Impact Study (EIS)

According to the EIA Regulations 1998, the EIS refers to the detailed study conducted to determine the possible environmental impacts of a proposed project and measures to mitigate their effects. Table 1.1.9 indicates key stages and their contents for the EIS process and Figure 1.1.3 summarizes the EIA process in Uganda.

Table 1.1.9 Key Stages for the EIS Process

Stage	Description
i) Scoping and TOR	<p>Scoping is the initial step in the EIS. Its purpose is to determine the scope of work to be undertaken in assessing the environmental impacts of the proposed project. It identifies the critical environmental impacts of the project for which in-depth studies are required, and elimination of the insignificant ones. The scoping exercise should involve all the project stakeholders so that consensus is reached on what to include or exclude from the scope of work. It is also at this stage that project alternatives are identified and taken into consideration. The contents of the scoping report are the same as the project brief however more detail is likely to be needed. This may involve some preliminary data collection and field work.</p> <p>The Developer takes the responsibility for scoping and prepares the scoping report after consultation with NEMA, Lead Agencies and other stakeholders. The developer with assistance from technical consultants will draw up the TOR for the EIS and submit a copy to NEMA that shall in turn be forwarded to Lead Agencies for comments (including the District Local Government or District Environment Officer).</p>
ii) Preparation of the EIS	<p>In preparing an EIS, relevant information is collected on issues of real significance and sensitivity. These are then analyzed, mitigation measures developed for the adverse impacts and compensatory measures recommended for unmitigated environmental impacts. Measures aimed at enhancing beneficial or positive impacts are also given. An EIS documents the findings and is submitted to NEMA by the developer.</p>
iii) Review of EIS and Decision on Project	<p>The Developer is required to submit ten (10) copies of the EIS to NEMA for review and approval. NEMA then forwards a copy to the Lead Agencies for comments. NEMA in consultation with the Lead Agencies (including the District Local Governments or District Environment Officer) shall review the contents of the EIS, paying particular attention to the</p>

Stage	Description
iv) Environmental Monitoring and Management Plan	<p>identified environmental impacts and their mitigation measures, as well as the level of consultation and involvement of the affected stakeholders in the EIS process. In this review, the level to which the TOR set out for the study is addressed shall be considered. In making a decision about the adequacy of the EIS, NEMA shall take into account the comments and observations made by the Lead Agencies, other stakeholders and the general public. NEMA may grant permission for the project with or without conditions, or refuse permission. If the project is approved, the Developer will be issued a Certificate of Approval.</p> <p>Monitoring is the continuous and systematic collection of data in order to assess whether the environmental objectives of the project have been achieved. Good precise demands that procedures for monitoring the environmental performance of proposed projects are incorporated in the EIS.</p> <p>To assist in implementation of identified mitigation and monitoring strategies, an environmental monitoring plan will be developed. It will describe the various environmental management strategies and programs to be implemented. It will also identify the management roles and responsibilities for ensuring that monitoring is undertaken, results are analyzed and any necessary amendments to precises are identified and implemented in a timely manner. The monitoring plan shall provide for monitoring of both project implementation and environmental quality. It shall contain a schedule for inspecting and reporting upon the implementation of the project and associated mitigation measures identified in the EIS. The monitoring plan shall also identify the key indicators of environmental impact. Further, the plan shall provide a schedule for monitoring each indicator and for reporting the monitoring results to NEMA or the Local Authority.</p>
v) Public Consultation	<p>The environmental impacts or effects of a project will often differ depending on the area in which it is located. Such impacts may directly or indirectly affect different categories of social groups, agencies, communities, and individuals. These are collectively referred to as project stakeholders or the public. It is crucial that during the EIA process, appropriate mechanisms for ensuring the fullest participation and involvement of the public are taken by the developer in order to minimize social and environmental impacts and enhance stakeholder acceptance.</p>

Source: JICA Study Team

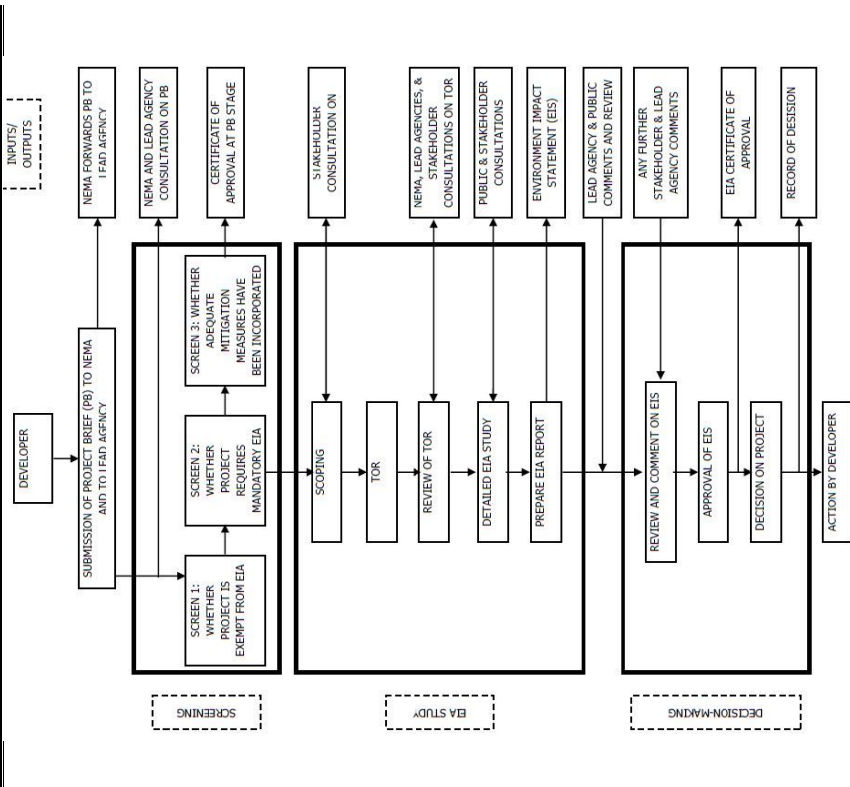


Figure 1.1.3 Schematic Summary of EIA Process in Uganda
Source: NEMA

1.1.4 Comparison of Alternatives (including Zero Option)
As discussed in Section 2.3 of Chapter 2 of Volume III, alternatives were compared mainly with 1) flood control, 2) environmental and 3) social impacts and the one was selected on a total-judgment basis. For selection of alignment of protection dyke and area, Alt-P3 (dikes to be set at both sides 30m from the hypothetical river centre) was selected to control flood effectively with reasonable amount of land occupation and fair ecosystem conservation. As per impact to the downstream, namely Ramsar Convention area, building dykes was expected to form sand bars and reduce sediment transport downstream (Alt-P2, P3 & P4).

On water course alternation, Alt-L1 (restoration of original waterway) was selected rather than Alt-L2 (construction of protection dyke along the existing waterway) or Alt-L0 (Zero option). In the comparison, Alt-L1 was not expected to give a critical impact to the downstream compared with others. Table 1.1.10 and Table 1.1.11 show the summary of alternative comparison for both case studies above-mentioned.

Table 1.1.10 Comparison of Alternative Plan for Water Course (repeated)

Alternative Plan name	ALT-L1 Restoration of original waterway	ALT-L2 Construction of protection dyke along the existing waterway	ALT-L0 Zero Option
Layout			
Outline of the Plan	This plan has installation of flood protection dyke along the original waterway which is also the boundary of Kween and Bulambuli District. Protection zone shall be set at 30m from hypothetical centre line of original waterway to preserve buffer zone for purification of water and preserve existing natural forest along old river course. Downstream part of original river shall be restored by excavating about 30cm from existing river bed to maintain the waterway and convey the same capacity of discharge with upstream.	This plan has installation of flood protection dyke along the existing river course which was a canal constructed to irrigate the right side of River Atari. Protection zone shall be set with 30m from centre line of irrigation canal to preserve buffer zone for purification of water.	Nothing shall be done. No regulation and wise-use of wetland become impossible. It is expected that planned CHWMP will be implemented by the community together with related District and to realize wise-use of wetland.
Irrigation Area	680ha	680ha	450ha
Length of protection dyke	3260m	3244m	0m
Acreege of Buffer zone	251,000m ²	215,000m ²	0ha
Acreege of Natural Forest	25,730m ² (10.3%)	640m ² (0.3%)	-
Environmental Impact	Seasonal water supply to aquatic habitats within buffer zone will be available resulting in supply water and nutrients to flora and fauna species within the enclosed floodplain. Oxbow with rich ecosystems will be affected but the degree is minor. Areas with invasive species will be disrupted during construction of the dyke. River water quality will be affected by excavated sediment where the dyke intersects the river meander during construction of the dyke. This is necessary in terms of biodiversity because the old river	Seasonal water supply to aquatic habitats within buffer zone will be available resulting in supply water and nutrients to flora and fauna species within the enclosed floodplain. Oxbow with rich ecosystems will be affected but the degree is minor. Areas with invasive species will be disrupted during construction of the dyke. River water quality will be affected by excavated sediment where the dyke intersects the river meander during construction of the dyke. This is necessary in terms of biodiversity because the old river	Current status unchanged. The environment will not be controlled.
Biodiversity	This is necessary in terms of biodiversity because the old river	Construction of a dyke is suitable in terms of conservation of	Current status unchanged and

Alternative	ALT-11	ALT-12	ALT-10
Water quality and purification	Better water quality due to sediment deposition, filtration, increased residence time hence better purification capacity.	Better water quality due to sediment deposition, vegetation filtration, increased residence time hence better purification capacity.	Current status unchanged
Environmental condition within protection zone	The restoration of original environmental status is expected by restoring the old river course, such as regeneration of riverine vegetation and aquatic living things like fish and amphibians. Dyke installation will be positive to keep water for aquatic organisms, esp. during wet season.	Restoration of the environment in the original part of the river is expected for riverine vegetation and aquatic organisms, but not much in the diverted part because of poorer ecological conditions compared with those in the original river part.	Current status unchanged
Affect to the downstream	Formation of sand bars and reduced sediment transport to Ramsar site is anticipated.	Formation of sand bars and reduced sediment transport to Ramsar site is anticipated.	Less impact to Ramsar site as the river course does not reach to.
Social Impact	Better land productivity that used to be flooded. Increased difficulty of community mobility across restored river during construction.	Better land productivity that used to be flooded. Decrease of accessibility to the river.	Water allocation from the river is still uneven for both sides.
Land acquisition and its impact	Land taking required. Increased difficulty of community mobility during construction.	Land taking required. Increased difficulty of community mobility during construction.	No land taking.
Involuntary resettlement within buffer zone	No resettlement within the buffer zone.	No resettlement required within the buffer zone.	No one have impact.
Impact to Local economy	680 ha land to gain the benefits of irrigation and corresponding better economic productivity.	680 ha land to gain the benefits of irrigation and corresponding better economic productivity.	Only 450 ha land to gain the benefits of irrigation.
Land use and utilization of local resources	Land near the river channel conserved and restricted for use. However, extending the river course will give chance to local people for water use.	Land near the river channel conserved and restricted for use. However, extending the river course will give chance to local people for water use.	Inefficient land use and local resource utilization continue.
Judgment and reason	Adopted The river course restoration and protection dyke installation will contribute to the local productivity in term of environmental and social aspect. Flood mitigation will be attained. Restoration of water flow in the downstream will hydrate the Ramsar site that prevents farmers' invention to the Ramsar site.	Not adopted The downstream part of left side of the project area will continue to dry up with no river water flow and it leads to dehydrate the Ramsar site that invites farmers' invention to the Ramsar site. Since existing waterway is artificial canal, building the buffer zone does not have much positive impact in terms of environmental and social aspect.	Not adopted No flood control is realized and negative impacts on the area are maximum.

Source: JICA Study Team

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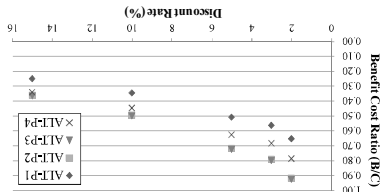
Table I.1.11 Comparison of Alignment of Protection Dyke and Protection Area (repeated)

Alternative	Plan name	Image	Outline of the Plan	Length of Dyke	Area of BZ (buffer zone)	Mean width of BZ	Area of PZ (protected zone)	Mean PZ width	HH in PZ	Flood Control
ALT-P1	Linear river by bank protection		River improvement by straight line with bank protection and no protection dyke against flood. Therefore more land resource can be available for 5 to 20m which is agreed on development.	3.65km	0ha	—	3.3ha	0m	0HH	Design discharge can be drained by low flow channel within short period. As velocity of flood flow is around 4.0m/s, it has a risk of taking away human life.
ALT-P2	Envelope shape covering river curvature		To install protection dyke along the current river curvature to prevent the flood flow. Even in this case, more space is needed for buffer zone than the space is almost the same as AL-T-P2.	3.84km	21.2ha	55m	35.4ha	92m	0HH	Installed protection dyke can protect the farmland and residential area from flood damage. Necessary height of FPD is 1.5m inclusive of extra banking for settlement.
ALT-P3	hypothetical river centre		To install protection dyke leaving 30m wide area from hypothetical river centre.	3.66km	22.5ha	61m	35.6ha	97m	0HH	Installed protection dyke can protect the farmland and residential area from flood damage. Necessary height of FPD is 1.4m inclusive of extra banking for settlement.
ALT-P4	Leaving 30m wide area from river curvature		To install protection dyke leaving 30m wide area from National Environment Regulation suggests taking 30m from river bank.	3.88km	38.5ha	99m	54.1ha	139m	32Buildings, 20hurs	Installed protection dyke can protect the farmland and residential area from flood damage. Necessary height of FPD is 1.5m inclusive of extra banking for settlement.
ALT-P5	Zero Option		Nothing shall be done, so no protection dyke and no buffer zone.	0km	—	—	—	—	—	Flood shall overflow the river course and affect to the farmland.

Impact	Description	Benefit, Cost and Environment from Coppling					Benefit, Cost and Environment from Coppling	Out of the Buffer zone
		Investment	O&M cost	Benefit	Benefits from Non-crop	Benefits from Coppling		
1st impact and land acquisition and involuntary resettlement within buffer zone	Minimal land to be acquired	point = 2					0 ha	
	Increased difficulty of community mobility during construction.	point = 3					0 ha	
	Increased difficulty of community mobility during construction.	point = 3					0 ha	
	No resettlement required within the buffer zone	point = 3					0 ha	
	Involuntary resettlement within buffer zone	point = 3					0 ha	
Impact to Local economy	A few farmers using river bed as source livelihood will be displaced.	point = 3	10,563,465,000 UGX	316,903,950 UGX/yr	545,514,706 UGX/yr	0 UGX/yr	60 ha	
	More land near the river channel to be developed for irrigation will require fertilizers - benefits of deposited alluvium.	point = 3					60 ha	
	Less land to gain the benefits of irrigation and corresponding better economic productivity.	point = 3					60 ha	
	More land irrigated and thus better economic productivity.	point = 3					60 ha	
	Flooding minimized. Economic loss due to flooding minimized.	point = 3					60 ha	
Benefit, Cost and Environment from Coppling	Investment	5,960,631,600 UGX	187,613,222 UGX/yr	178,818,853 UGX/yr	375,495,956 UGX/yr	53,859,899 UGX/yr	18.7 ha	
	O&M cost	6,253,774,080 UGX	187,613,222 UGX/yr	178,818,853 UGX/yr	375,495,956 UGX/yr	53,859,899 UGX/yr	18.7 ha	
	Benefit	10,563,465,000 UGX	316,903,950 UGX/yr	178,818,853 UGX/yr	375,495,956 UGX/yr	53,859,899 UGX/yr	18.7 ha	
	Benefits from Coppling	6,253,774,080 UGX	187,613,222 UGX/yr	178,818,853 UGX/yr	375,495,956 UGX/yr	53,859,899 UGX/yr	18.7 ha	
	Benefits from Non-crop	5,960,631,600 UGX	187,613,222 UGX/yr	178,818,853 UGX/yr	375,495,956 UGX/yr	53,859,899 UGX/yr	18.7 ha	
Out of the Buffer zone	Investment	6,318,917,560 UGX	189,567,527 UGX/yr	189,567,527 UGX/yr	293,668,750 UGX/yr	79,781,775 UGX/yr	32.3 ha	
	O&M cost	6,318,917,560 UGX	189,567,527 UGX/yr	189,567,527 UGX/yr	293,668,750 UGX/yr	79,781,775 UGX/yr	32.3 ha	
	Benefit	10,563,465,000 UGX	316,903,950 UGX/yr	178,818,853 UGX/yr	375,495,956 UGX/yr	53,859,899 UGX/yr	32.3 ha	
	Benefits from Coppling	6,318,917,560 UGX	189,567,527 UGX/yr	189,567,527 UGX/yr	293,668,750 UGX/yr	79,781,775 UGX/yr	32.3 ha	
	Benefits from Non-crop	6,318,917,560 UGX	189,567,527 UGX/yr	189,567,527 UGX/yr	293,668,750 UGX/yr	79,781,775 UGX/yr	32.3 ha	
Buffer zone	Minimal land to be acquired	point = 2					0 ha	
	Increased difficulty of community mobility during construction.	point = 2					0 ha	
	Increased difficulty of community mobility during construction.	point = 2					0 ha	
	No resettlement required within the buffer zone	point = 2					0 ha	
	Involuntary resettlement within buffer zone	point = 2					0 ha	

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Total wetland ⁴⁾	60 ha	60 ha	60 ha	60 ha	60 ha
B/C ratio	0.347	0.495	0.501	0.448	≥ 2
Data and Assumpti	<p>1) Investment cost as direct construction cost for flood protection dyke alone, covering both left and right banks with given length (km), disbursed 50-50% over 2 years. Annual O&M cost is set uniformly as 3% of the direct construction cost for all plans.</p> <p>2) Cropping values include lowland rice, maize, banana, beans, yams, cassava, and vegetables (leafy) under Without Project condition; while only rice and maize included for With Project condition. Economic values referred to Table 1.3.5 (1.3.4 Wetland and Land Resource). The benefit per unit area (UGX/ha/yr) estimated as summed individual economic values (UGX/yr) divided by the total production area (ha), derived from the GIS image analysis. Net return values under With/Without Project, similarly applied in the Chapter 6, were reflected for lowland rice and maize production. For annual crop benefit of the P5 ZERO OPTION, "0" benefit was applied (benefit is nil) for 10th, 20th and 30th year due to assumed serious damages by 1/100-year-probability flooding.</p> <p>3) Non-crop values contain: natural resources available within the BZ including building poles, roofing poles, reeds, grass for building, grass for livestock, fibers, water (domestic and livestock), herbs, fish and firewood. For calculation purpose, the BZ was defined more broadly by including areas of river/warmp/road/lea.</p> <p>4) Total area of wetland assumed as 60 ha; 3,000m (length, river-line) by 200m (width, across the river), and set constant over different ALT-P1 plans for comparison purpose. The area of BZ was calculated using the mean width of BZ as presented above, then the Out of BZ area (for cropping) gained by subtracting area of BZ from the total area of targeting wetland. Buffer zones for ALT-P1, P5 were assumed either as deminished due to land development or exploitation due to no protection from flooding/human economic activities.</p> <p>5) O&M cost for P5, refined as environmental management cost, referred to Kakuru et al. (2013)² for an annual unit management cost (USD/ha) by the local government.</p>				
Note:	<p>The B/C ratio calculated on the discounted values (present value) of benefit and cost components over a 30-year project life. Discounting rate of 10% was applied as a normal discounting rate which would not favour private investment decisions by individuals, while, viewing a long-term support relationship between environmental impact by the project and an aspect of long-term life support system of the environment. This will be critical when we see the employing different discount-rate from low to high to comprehend environmentally sound discounting factor.</p>				



² Kakuru, W., N., Turyahabwe and J. Mugisha (2013) Total economic value of wetlands products and service in Uganda. The Scientific Journal, Vol.12013, Article ID192656, 13pp. The cost used for Zero Option: (15,428USD/yr+68,932ha x 3300UGX/USD + 137HH*5000UGX/HH, referred to the total management cost on Kyoto plains of 68,932ha. Management cost includes government funding, local revenue and salary/allowance for staffs. Water user fee (communal contribution) also considered for current number of users (households).

³ Hasegawa, H., K. Mhiani and C. Okano (2005) Methods and case-studies of economic evaluation on environmental impact of the agricultural and forestry projects in developing countries. Institute for International Cooperation, Japan International Cooperation Agency (JICA), (in Japanese)

1.1.5 Scoping and TOR for Investigation of Environmental and Social Considerations

Scoping of the EIA study for the project was discussed and prepared in accordance with the initial survey. The result of scoping is shown in Table 1.1.12. Based on the scoping table, no item is rated as "A", and 19 and 16 items as "B" (some positive/negative impacts are expected) for pre/during construction and operation phase, respectively. On the other hand, 9 and 10 items are rated as "D" (few impacts are expected).

Table 1.1.12 Scoping of the EIA Study for the Atari Irrigation Project

No.	Item	Rating		Description of Impacts
		Pre-/Const.	Operation	
1	Air Pollution	B-	D	[Design/Construction phase] Dust and exhaust gas may be generated temporarily. The impact is slight as there are few houses. [Operation phase] Air pollution is not anticipated because there is no source.
2	Water Pollution	B-	B-	[Design/Construction phase] Inflow of turbid water from the construction sites is expected. Drained water like night soil from workers' camp areas can be a source of water pollution if it flows in. [Operation phase] Farmers scarcely use chemical fertilizers and agrochemicals at present. In addition, great increase of such chemical materials that cause water pollution is not expected. However, impact caused by expansion of chemical materials may affect downside of project area, especially to fishery and papayas.
3	Soil Contamination	B-	C	[Design/Construction phase] Spilled oil from construction machinery may cause soil contamination. [Operation phase] Salt damage of farmlands is anticipated but the extent is unsure.
4	Wastes	B-	B-	[Design/Construction phase] Construction works will generate scrap materials and wastes. And wastes from workers' camp can be a source. [Operation phase] Agricultural residues like paddy straw and rice husk after harvesting may be generated and needed a proper treatment.
5	Noise and Vibration	B-	D	[Design/Construction phase] Though impact by construction machinery is expected, the range may be limited as the area is farmland and the population is few. [Operation phase] Impact by noise and vibration is not anticipated because there is no noise/vibration source.
6	Ground Subsidence	D	D	[Design/Construction phase], [Operation phase] The works, which cause ground subsidence (such as excessive pumping-up), is not scheduled and pumping-up of groundwater is not necessary in operation phase. Thus, ground subsidence is not expected.
7	Offensive Odors	D	D	[Design/Construction phase], [Operation phase] Use of machinery and works, which cause offensive odors, is not expected. Generation of offensive odors is not expected.
8	Topography and Geographical Features	D	D	[Design/Construction phase], [Operation phase] Large-sealed modification in topography and geographical features is not required as the irrigation and drainage channel are designed by making use of existing geographical slope.
9	Flora, Fauna and Biodiversity	B-	B-	[Design/Construction phase] Plant trimming, decrease of habitats of wild animals and disturbance of wetland ecosystem are anticipated by construction work. [Operation phase] In case farmers decide local plants are not useful to their activities, they would vanish these plants.

Land use and utilization of local resources	More land near the river channel developed for irrigation.	Fishing will be hampered by faster water flow and steep banks.	More land near the river channel in the buffer zone conserved and restricted for use.	Better for fishing due to moderate flows, presence of spawning grounds and accessible banks.	Allows for regeneration of riverine vegetation that can be used as a renewable resource, medicinal and for craft raw materials.	More land near the river channel in the buffer zone conserved and restricted for use.	Better for fishing due to moderate flows, presence of spawning grounds and accessible banks.	Allows for regeneration of riverine vegetation that can be used as a renewable resource, medicinal and for craft raw materials.	More land near the river channel in the buffer zone conserved and restricted for use.	Better for fishing due to moderate flows, presence of spawning grounds and accessible banks.	Allows for regeneration of riverine vegetation that can be used as a renewable resource, medicinal and for craft raw materials.
point = 1	point = 1	point = 1	point = 3	point = 4	point = 5	point = 2	point = 4	point = 5	point = 2	point = 4	point = 5
Very Bad	Very Bad	Very Bad	Good	Very Good	Fair	Fair	Very Good	Fair	Fair	Very Good	Fair
24	24	24	36	38	35	35	38	35	35	38	35
25	25	25	25	25	25	25	25	25	25	25	25

Source: IICA Study Team

No.	Item	Rating		Description of Impacts
		Pre-/Const.	Oper-ation	
10	Protected Areas	B-	B-	[Design/Construction phase] Drained water caused by construction may disturb the Ramsar Convention in which is located downstream Atari River. [Operation phase] Drained water with fertilizer is anticipated to give certain impact on the Ramsar Convention area but the extent is expected to be limited. [Design/Construction phase] Soil erosion is expected near borrowing pit. [Operation phase] This project will convert existing farmland and grassland into rice field. Thus, multiple function of rice field will prevent soil erosion. [Design/Construction phase] Dredging depth is shallow and construction works will be done by open-cut. In addition, the construction method, which decrease groundwater level such as deep well method, is not going to be applied in construction, thus the impact on groundwater is not expected. [Operation phase] Ground water may be contaminated by fertilizers but the impact is expected minimum as river water will be used in irrigation.
11	Soil Erosion	B-	B+	[Design/Construction phase] Water flow may be disturbed when constructing the head work. [Operation phase] Reduction of water volume to downstream is expected by utilization of irrigation water. On the other hand, it becomes possible to get irrigation water stably at the area to be given benefit in operation phase.
12	Groundwater	D	B-	[Design/Construction phase] Impact on global warming such as massive amount of release of greenhouse gas is not expected both in construction phase and operation phase.
13	Hydrological Situation	B-	B+/-	[Design/Construction phase] Land acquisition is required for the construction of irrigation facilities. On the other hand, there are very few houses and involuntary resettlement is not expected by modifying alignment of irrigation facilities. [Operation phase] The impact can be estimated by future study.
14	Global Warming	D	D	[Design/Construction phase] Generation of new employment is expected during construction. [Operation phase] Increase of irrigation water may raise productivity.
15	Involuntary Resettlement/Land Acquisition	B-	C	On the other hand, person who utilizes wetland for the purpose of fishery, farming, harvesting and processing of Papyrus, etc. (other than rice farming) are likely to be affected. [Design/Construction phase] It is concerned that heavy machinery and material yard may ruin landscape. [Operation phase] Landscape of the project area is not disturbed because the facilities to be planned will not be large.
16	Local Economy such as Employment and Livelihood, etc.	B+	B+/-	Person who utilizes wetland for the purpose of fishery, farming, harvesting and processing of Papyrus, etc. (other than rice farming) are likely to be affected. [Design/Construction phase] Building the buffer zone may restrict fishery and other activities around the zone. On the other hand, the ecosystem in the buffer zone will be properly conserved.
17	Landscape	B-	D	
18	Land Use and Utilization of Local Resources	B-	B-	

No.	Item	Rating		Description of Impacts
		Pre-/Const.	Oper-ation	
19	Split in Community	D	B+/-	[Design/Construction phase] The boundaries will be identified before the construction, so split in community is not anticipated. [Operation phase] People in community expected to be united as water user's association will be established. On the other hand, tension may be generated between rice farmers and people who utilize wetland for fishing, farming, etc. [Design/Construction phase] Although it is expected traffic volume of construction related vehicles will increase, the impact is limited as the site is located in rural area. [Operation phase] Since the irrigation project provides new facilities and utilizes the existing social infrastructures, no adverse impacts are anticipated.
20	Existing Social Infrastructures and Services	B-	D	[Design/Construction phase] New employment is expected to be generated during construction. [Operation phase] Increase of irrigation water may raise productivity. On the other hand, person who utilizes wetland for the purpose of fishery, farming, harvesting and processing of Papyrus, etc. (other than rice farming) are likely to be affected.
21	The Poor, Indigenous and Ethnic People	B+	B+/-	[Design/Construction phase] The project will try to provide fair support to affected people, so the misdistribution of benefit and damage is not anticipated. [Operation phase] There may be gaps between beneficiaries and non-beneficiaries.
22	Misdistribution of Benefit and Damage	D	B-	[Design/Construction phase] There is no cultural heritage authorized by GoU in/around project area. Then adverse impacts are not anticipated during design/construction phase as well as operation phase.
23	Cultural Heritage	D	D	[Design/Construction phase] Although farmers sometimes fight with regard to boundaries but large-scale objection movement regarding land dispute and project has not reported in project area. However, careful attention should be paid to local residents. [Operation phase] There may be gaps between beneficiaries and non-beneficiaries.
24	Local Conflict of Interests	C	B-	[Design/Construction phase] Impact on water usage of farmers at downstream is expected by unstable water flow. [Operation phase] Planned water usage will be established by the project.
25	Water Usage or Water Rights and Rights of Common	B-	B+/-	[Design/Construction phase] Slight impact on children by water drawing work is expected, but the extent is unsure. [Design/Construction phase] Since local residents will be employed as construction worker, outbreak of infectious disease is not so expected, but the extent is unclear.
26	Gender/ Children's Rights	C	C	[Operation phase] Spread of infectious diseases by the project is not anticipated because this is an irrigation project. However, endemic diseases caused by spread of water use may be potential.
27	Hazards (Risks), Infectious Diseases such as HIV/AIDS	C	C	[Design/Construction phase] Deterioration of working condition is concerned by breaking regulations. [Operation phase] The project will not give negative impact on-farmers since the farming way will not be drastically changed.
28	Working Conditions/ Accidents	B-	D	

No.	Item	Rating		Description of Impacts
		Pre-Const.	Operation	
29	Accident	B-	B-	[Design/Construction phase] Accident may be caused by neglect of regulation and imperfect following to safety countermeasures. [Operation phase] Car and motorbike traffic on the service roads along the canals may be a cause of traffic accident. Children who play around borrow pits may have a physical accident. The development of canals in the area may induce approaching unexpected animals like wild reptiles and giving damages to farmers and domestic animals. [Design/Construction phase] Considering the scale of facility, impact on the Nile River basin is not expected. [Operation phase] Water intake from Atari River is not sure to give an adverse impact on the Nile River basin. Further study is needed.
30	Across-boarder problems	D	C	[Design/Construction phase], [Operation phase] Malfunction may be caused by the neglect of monitoring system during construction and operation phases, respectively.
31	Monitoring System	B-	B-	

Rating:

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C+/-: Extent of positive/negative impact is unknown

(Examination is needed. Impacts may become clear as study progresses.)

D: No impact is expected

Source: JICA Study Team

Based on the scoping results shown in Table 1.1.12, necessary survey items for the EIA study were selected and examined study methods as well as expected countermeasures. The terms of reference (TOR) for the EIA study for the Atari irrigation project is shown in Table 1.1.13.

Table 1.1.13 TOR for EIA Study for the Atari Irrigation Project

No.	Environmental Item	Study Item	Study Method
1	Air Pollution	<ul style="list-style-type: none"> Related environmental standards Current condition of project area Confirmation of construction works and heavy machinery 	<ul style="list-style-type: none"> Study on existing materials Site survey and interview survey
2	Water Pollution	<ul style="list-style-type: none"> Related environmental standards River water quality Current status of river water in domestic use 	<ul style="list-style-type: none"> Study on existing materials Water quality examination (pH, Turbidity, EC, BOD, DO, TSS, T-P, T-N, NH₄-N, NO₃-N, PO₄-P) at 3 sites (upstream, intake and downstream) at 4 times (each 2 for dry & rainy seasons respectively). Interview survey to farmers regarding the usage of agrochemicals and fertilizers
3	Soil Contamination	<ul style="list-style-type: none"> Confirmation of related regulations Confirmation of similar cases Confirmation of agrochemicals 	<ul style="list-style-type: none"> Review of existing laws Data collection from other Irrigation schemes in the country, MAAIF, MWE, and farmers Data collection from farmers on usage of fertilizer and pesticides and its impact on soil Soil fertilizer analysis (pH, EC, O-C, T-N, CEC, minerals (Ca, Mg, K, Na, P))
4	Waste	<ul style="list-style-type: none"> Confirmation of related regulations Information gathering regarding disposal measures from similar cases 	<ul style="list-style-type: none"> Reviewing of existing regulations Data collection from other Irrigation Scheme in the country, MAAIF, MWE, and farmers Any other method acceptable to the Client
5	Noise and Vibration	<ul style="list-style-type: none"> Related environmental regulations Current condition of project area Confirmation of construction works and heavy machinery 	<ul style="list-style-type: none"> Site survey and interview survey

No.	Environmental Item	Study Item	Study Method
9	Flora, Fauna and Biodiversity	<ul style="list-style-type: none"> Current status of ecologically important site (site for breeding and feeding) Current living condition and site 	<ul style="list-style-type: none"> Review of existing laws Review of existing data and information such as IBA and TUCN, especially for those in the Red List Learning from DEO and farmers Field survey and hearing from concerned body (plant, mammals, birds, amphibians, reptiles and aquatic living things at 1 site for 2 seasons)
10	Protected Areas	<ul style="list-style-type: none"> Information about protected area Confirmation of current status of river water usage Confirmation of construction works and location 	<ul style="list-style-type: none"> Reviewing of current regulations Study on existing materials Site survey and interview survey (targeting Ramsar area)
11	Soil Erosion	<ul style="list-style-type: none"> Confirmation of current status of project area Confirmation of construction works and location 	<ul style="list-style-type: none"> Study on existing materials Site survey and interview survey (grain size & component, specific gravity of suspended solid)
12	Ground Water	<ul style="list-style-type: none"> Related environmental standards Ground water quality (boreholes) Current status of groundwater in domestic use 	<ul style="list-style-type: none"> Study on existing materials Water quality examination Interview survey to farmers regarding the usage of agrochemicals and fertilizers
13	Hydrological Situation (e.g. river discharge and change of river bed)	<ul style="list-style-type: none"> Confirmation of current status of project area Confirmation of construction contents and location 	<ul style="list-style-type: none"> Study on existing materials Site survey and interview survey Volume of river discharge
15	Involuntary Resettlement/Land Acquisition	<ul style="list-style-type: none"> Related regulations Similar cases Confirmation of construction works and location Confirmation of procedure of land acquisition and compensation Confirmation of residents whose land will be acquired Confirm the life and livelihood of affected residents Identified residents 	<ul style="list-style-type: none"> Reviewing of current regulation regarding land acquisition Interview to MAAIF, MWE, and district Study on existing materials Baseline survey Interview survey to farmers *Surveys related are done in DARAP study.
16	Local Economy such as Employment and Livelihood, etc.	<ul style="list-style-type: none"> Confirmation of domestic economy Current status of occupation and livelihood including non-farmer 	<ul style="list-style-type: none"> Reviewing of existing information Consultation meeting Baseline survey Interview survey to farmers
17	Landscape	<ul style="list-style-type: none"> Confirmation of location of heavy machinery and stockyard Confirmation of the place where special attention should be paid to keep landscape 	<ul style="list-style-type: none"> Site survey (landscape survey) Baseline survey
18	Land Use and Utilization of Local Resources	<ul style="list-style-type: none"> Confirmation of land use Current status of occupation and livelihood of the household on which the project may cause impact 	<ul style="list-style-type: none"> Reviewing of existing information Consultation meeting Baseline survey Interview survey to farmers
19	Split in Community	<ul style="list-style-type: none"> Confirmation of existing dispute in project area 	<ul style="list-style-type: none"> Consultation meeting Interview survey to farmers
20	Existing Social Infrastructures and Services	<ul style="list-style-type: none"> Confirmation of surrounding traffic condition 	<ul style="list-style-type: none"> Interview to district and farmers
21	The Poor, Indigenous and Ethnic People	<ul style="list-style-type: none"> Confirmation of poor and indigenous people among affected people 	<ul style="list-style-type: none"> Acquisition of related regulations and cases Population census survey Baseline survey
22	Misdistribution of Benefit and Damage	<ul style="list-style-type: none"> Current status of occupation and livelihood of the household on which the project may cause impact 	<ul style="list-style-type: none"> Consultation meeting Baseline survey Interview to farmers Consultation meeting Interview to farmers
24	Local Conflict of Interests	<ul style="list-style-type: none"> Confirmation of existing dispute in project area 	<ul style="list-style-type: none"> Consultation meeting Interview to farmers