JCM Project Design Document Form

A. Project description

A.1. Title of the JCM project

Electrification of communities using Ultra Low Head Micro Hydro Power Generation system

A.2. General description of project and applied technologies and/or measures

The proposed JCM project aims to supply electricity to Kiuria village in Kirinyaga county, the Republic of Kenya by introducing Ultra Low Head Micro Hydro Power Generation system (ULH-MHP). This ULH-MHP system is installed in the existing irrigation water channel besides Kiuria village (the community).

Two systems of ULH-MHP are installed in the community and total capacity is 30kW (15kW each), actual output is 20kW (10kW each). Electricity from two ULH-MHPs is integrated by a control panel and supplied to the community.

A part of the community is already electrified by national electricity grid. The electricity generated by ULH-MHP is supplied to the facilities which are not connected to national electricity grid. Electricity is supplied to some facilities owned and managed by the community.

This project was supported by LCET (Low Carbon Low Emission Clean Energy Technology Transfer) funded by Ministry of Economy, Trade and Industry, Japan and executed by UNIDO (United Nations Industrial Development Organization). The whole initial costs of implementation were provided through LCET Programme.

In October 2016, the installation of two system of ULH-MHP was completed. After the installation, commission to the project participants was delayed due to water shortage caused by the draught. Through an output test for commission, the ULH-MHP started operation in September 2018.

This project can achieve the annual GHG reduction of 82 tCO2e.

A.3. Location of project, including coordinates

Country	Republic of Kenya
Region/State/Province etc.:	Kirinyaga County
City/Town/Community etc:	Kiuria village, Mwea west sub County
Latitude, longitude	0°39'34.4"S 37°18'24.8"E

A.4. Name of project participants

The Republic of Kenya	National Irrigation Board (NIB), Mwea Irrigation Water users' Association(IWUA)
Japan	NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc., JAG Seabell Co., Ltd.

A.5. Duration

Starting date of project operation	30/9/2018
Expected operational lifetime of project	9years

A.6. Contribution from Japan

The state-of-the-art technology of ULH-MHP which was developed by the Japanese project participant, JAG Seabell Co., Ltd. was introduced in the proposed project. The Japanese project participant transfers the technology through training to the Kenyan project participant. LCET programme which was funded by Ministry of Economy, Trade and Industry, Japan and executed by UNIDO provided all the initial cost to install ULH-MHP

A.7. Contribution from Kenya (Optional)

The Kenyan project participants operate the ULH-MHP with proper training by the Japanese project participants.

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	KE_AM001
Version number	1.0

B.2. Explanation of how the project meets eligibility criteria of the approved methodology

Eligibility criteria	Descriptions specified in the methodology	Project information
Criterion 1	The project installs a run-of-river micro hydropower generation unit which is not connected to national electricity grid.	The ULH-MHP is connected to the facilities which are not connected to national electricity grid. In other words, ULH-MHP is not connected to national grid.
Criterion 2	The micro hydropower generation unit is installed in open channel with difference of elevation of 5m	The head drop, difference of elevation between the upstream and downstream. at the site is 1.0m to 1.8m.

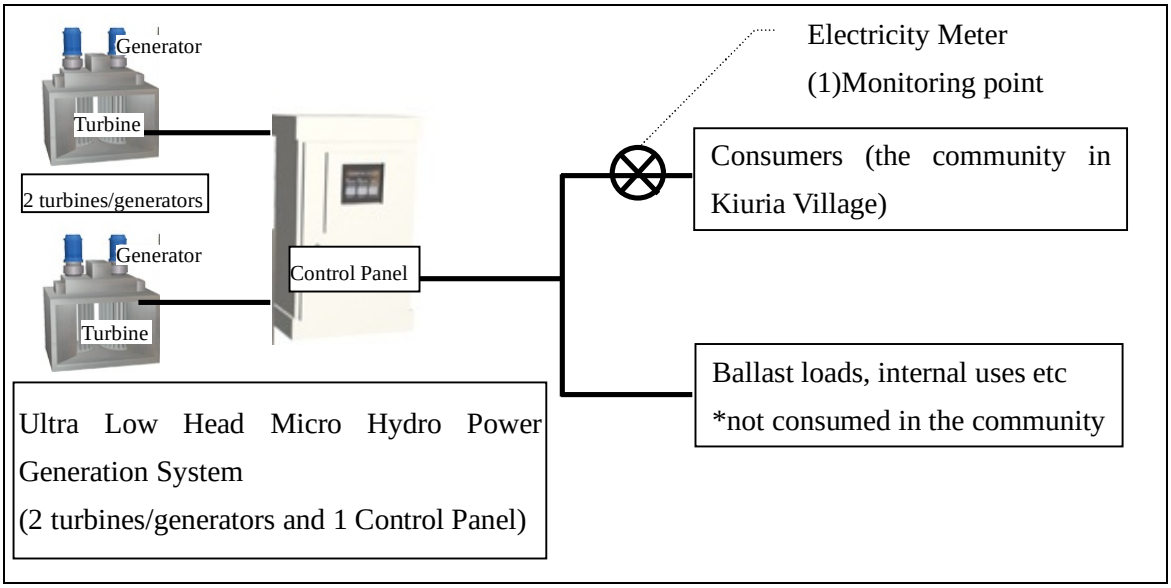
	or less between the upstream and downstream.	
Criterion 3	Project monitors the quantity of total electricity consumption by the consumers as a whole.	An electricity meter is installed to monitor the total electricity consumption by the consumers as a whole.

C. Calculation of emission reductions

C.1. All emission sources and their associated greenhouse gases relevant to the JCM project

Reference emissions	
Emission sources	GHG type
Consumption of grid electricity	CO_2
Project emissions	
Emission sources	GHG type
Generation of electricity from ULH-MHPs	N/A

C.2. Figure of all emission sources and monitoring points relevant to the JCM project



C.3. Estimated emissions reductions in each year

Year	Estimated Reference emissions (tCO_2e)	Estimated Project Emissions (tCO_2e)	Estimated Emission Reductions (tCO_2e)
2013	-	-	-
2014	-	-	-
2015	-	-	-
2016	-	-	-

2017	-	-	-
2018	20.0	0	20
2019	82.6	0	82
2020	82.6	0	82
2021	82.6	0	82
2022	82.6	0	82
2023	82.6	0	82
2024	82.6	0	82
2025	82.6	0	82
2026	82.6	0	82
2027	-	-	-
2028	-	-	-
2029	-	-	-
2030	-	-	-
Total (tCO_2e)			676

D. Environmental impact assessment/ social impact assessment/ strategic environmental assessment	
Legal requirement of environmental impact assessment/ social impact assessment/ strategic environmental assessment for the proposed project	Yes

E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

Prior to the commencement of this project, UNIDO conducted Stakeholder Consultation Workshop on 17th March 2014. UNIDO conducted another Stakeholder Consultation Workshop on 8th May 2014 and the participants of the Workshop consented to the inception of the project. The national/local relevant government officers and leading community members living in Kiuria Village were invited by letters and calling on themselves and their phones. At the second Stakeholder Consultation Workshop on 8th May 2014, they didn't express comments regarding the installation of ULH-MHP.

NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc. held an additional workshop on 21st February 2017 in Tokyo to explain the process to develop this project under

the JCM, as well as the roles and responsibilities of the project participants. The project participants shared a common understanding on these issues. The national relevant government officers were invited to Japan by letters and e-mails.

#	Date	Venue	Method	Participants
1	17th March 2014	NIB Mwea Irrigation Scheme Guest House	Work shop (face to face)	- UNIDO - Ministry of Industrialization and Enterprise Development - Ministry of Energy and Petroleum - NIB - IWUA - JAG Seabell - NTT DATA INSTITUTE OF MANAGEMENT CONSULTING
2	8th May 2014	Nairobi Serena Hotel	Work shop (face to face)	- UNIDO - Ministry of Industrialization and Enterprise Development - Ministry of Agriculture - Ministry of Energy and Petroleum - Rural Electrification Authority - County Government of Kirinyaga - NIB - IWUA - Embassy of Japan
3	21st February 2017	Ministry of Economy, Trade and Industry (Tokyo)	Work shop (face to face)	[Kenyan side] - Ministry of Environment and Natural Resources - NIB - Ministry of Industry, Trade and Cooperatives - Ministry of Water and Irrigation - Ministry of Energy and Petroleum - Ministry of Environment and Natural Resources

				[Japanese side] - Ministry of Ministry of Economy, Trade and Industry - Ministry of the Environment - Forestry Agency - New Energy and Industrial Technology Development Organization - NTT DATA INSTITUTE OF MANAGEMENT CONSULTING - UNIDO

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
NIB (National Irrigation Board)	NIB would take role in being the execution agency and also allocating site manager for the project. (comment at 1st stakeholder consultation, 17th March 2014)	No actions are required.
NIB (National Irrigation Board)	On the project implementation level, both NIB and the Community can take a role of a focal point. However, in terms of policy level, depending on the issues, different ministries such as Ministry of Water and Irrigation and MENR may be a focal point. (comments at 3rd stakeholder consultation, 21st February 2017)	Members who attended this meeting consented to the followings: 1) NIB and Mwea Irrigation Water users' Association would be "Project participants" and "Focal points" of this JCM project, and 2) the relevant Government agencies would support this project in terms of policy level consultation about the JCM. No further actions are required.
Kiuria Village	The village chairman highlighted that they were ready and very enthusiastic about the project. He queried on whether the community would be putting any cash to the project.	Members who attended this meeting consented that UNIDO would provide the equipment for the power generation, however the community should consider putting their

	(comments at 1st stakeholder consultation, 17th March 2014)	investment plans for productive use. The community installed the facility for productive uses which would consume the electricity from ULH-MHP in August 2018.

F. References
1. National Environment Management Authority "Environmental Impact Assessment License, NEMA/EIA/PSL/2937, on 2nd March, 2016"

Reference lists to support descriptions in the PDD, if any.

Annex
N/A

Revision history of PDD		
Version	Date	Contents revised
01.0	27/02/2017	First edition
02.0	01/10/2018	Second edition
03.0	30/10/2018 27/01/2020	Third edition (Updating the version of PDD form) Initial registration at JC4