

Country Name	the Programme for Community-based Flood Disaster Management to Adapt to Climate Change in the Nyando River Basin
Republic of Kenya	

I. Project Outline

Background	In Kenya, residents in the lower reaches of the Nyando river have experienced massive flooding during the rainy season almost every year. Under such circumstances, there was a pressing need for comprehensive flood control measures in many communities. In view of that, through JICA's technical cooperation scheme ("The Study on Integrated Flood Management for Nyando River Basin"), pilot projects including structural and non-structural measures were implemented in five communities in 2007. From the outcomes of these interventions, the necessity of taking into consideration the sustainability of integrated community-driven or participatory approaches was identified. It was also evident that each Community-based Flood Management Organization (CFMO) was a key player especially in terms of disseminating the experiences and performance of the target communities to other communities in flood-prone areas. Therefore, in order to cope with chronic flooding in the Nyando river basin, there was the need to further implement small-scale and low-cost projects in communities besides the pilot ones.					
Objectives of the Project	To establish a Community-Based Flood Management System (CBFMS) through structural and non-structural measures in the project to adapt to the climate change in the Nyando river basin, thereby contributing to achieving sustainable economic growth and reducing poverty in the Nyando river basin.					
Contents of the Project	1. Project Sites: 24 communities in Kisumu County. 2. Japanese side (1) Construction works for boreholes, culverts, bridges, weirs, and evacuation centers, etc. (2) Implementation of non-structural measures (Soft-component): development of CFMOs, community flood management training, an education program for disaster prevention, a radio program on flood management, and public awareness-raising on flood disaster prevention, etc. 3. Kenyan side: ■ Structural measures (1) Securing land for undertaking the construction work and maintenance after construction (2) Coordination and registration of the ownership of the structural measures with related organizations (3) Coordination of the EIA approvals for the structural measures ■ Non-structural measures (1) Presence at the meetings with the communities. (2) Presence at the long radio programs and coordination with experts for the participation. (3) Coordination with the Water Resource Users Associations (WRUAs) for training in writing fundraising proposals. (4) Coordination with related authorities for the education programs, including the assessment of the education programs and the preparation and distribution of textbooks. (5) Coordination with local governments and related authorities for distributing the posters.					
Project Period	E/N Date	May 19, 2009	Completion Date (ex-ante)	March 2011	Completion Date	October 26, 2011 (completion date of construction works)
	G/A Date	May 19, 2009			(actual)	
Project Cost	E/N Grant Limit / G/A Grant Limit: 483 million yen, Actual Grant Amount: 483 million yen					
Executing Agency	Water Resources Authority: WRA (Water Resources Management Authority was reorganized into WRA in April 2017)					
Contracted Agencies	Main Contractor(s): Gogni-Rajope Construction Company Limited Main Consultant(s): Nippon Koei Co., Ltd. Agent: Japan International Cooperation System					

II. Result of the Evaluation

<Constraints on Evaluation>

- Due to restrictions on physical association including meetings and gatherings during the COVID-19 Pandemic, coupled with difficulties in accessing some sites, data gathered in the project sites during the ex-post evaluation was limited both in quantity and quality. Nonetheless, countermeasures were taken as follows; 1) sampling of sites, 2) some reliance on existing monitoring data collected prior to COVID-19, 3) increased scope of desk-based review of administrative data, 4) use of remote data collection and analysis methods where available.

< Special Perspectives Considered in the Ex-Post Evaluation >

- Structural measures under the project were implemented in a total of 81 sites in 24 communities residing in three sub-counties. For the ex-post evaluation, the following communities were selected to represent the administrative locations of the three sub-counties. In the purposive sampling, other factors were taken into consideration such as population, type of structures constructed, the combination of structural measures and non-structural measures, accessibility of data/information, and ease of accessibility to the sites.
 - Mowlem, Kamuga, Oyola, Komwaga, Kowiti (Kisumu East sub-county)
 - Wasiese, Achuodho, Wakes (Muhoroni sub-county)
 - Kanyilum, Nyachoda, Kojunga (Nyando sub-county)

- In addition to the fact that the project was completed a decade ago, the set of indicators of the ex-ante evaluation was neither feasible nor comparable at the time of the ex-post evaluation. Therefore, it was necessary to reframe alternative indicators as corroborating evidence of the achievements in light of the objectives of the project. Also, supplementary indicators to measure the intended impact were added.

1 Relevance

<Consistency with the Development Policy of Kenya at the Time of Ex-Ante >

The project was consistent with the development policy of Kenya at the time of the ex-ante evaluation. “The 9th National Development Plan” (2002-2008) estimated the percentage of people living below the absolute poverty line as 53% in Kisumu District and 69% in Nyando District (now both within Kisumu County). Flooding also adversely affected agricultural production, the main driver of economic development in both districts. Flood management in the Nyando River Basin was therefore placed as one of the priority projects in Kenya Vision 2030’s “First Medium-Term Plan (2008-2012)” that advocated for sustainable economic growth and poverty reduction.

<Consistency with the Development Needs of Kenya at the Time of Ex-Ante >

The project was consistent with the development needs of Kenya at the time of the ex-ante evaluation. In 2003, the southern part of Lake Victoria Basin including the Nyando River experienced massive flooding that severely affected the livelihood of approximately 22,000 people. Subsequently, Garissa town, located in the middle of the Tana River Basin was hit by floods in 2007 that caused financial losses estimated at 8.5 million US dollars.

<Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation>

The project was consistent with Japan’s ODA policy for Kenya at the time of the ex-ante evaluation. Based on the bilateral economic cooperation policy dialogue held in 2000, Japan committed to supporting the promotion of adaptation measures to climate change through forest conservation and flood control as part of its 5 priority areas.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Effectiveness>

The project partially achieved its objectives at the time of ex-post evaluation. Regarding the structural measures, most of the facilities such as boreholes and evacuation centres were functional and utilized. However, in a site such as Kanyilum, the borehole was not in use as the water quality became exceedingly saline for unclear reasons. In addition, some toilet facilities were damaged and became unusable in Kowiti, Achuodho, and Kanyilum. According to the result of the field survey, there has been a significant increase in the construction of houses as well as improvement of roads and drainages in the project areas. These developments have affected the volume, speed and direction of surface runoff and flood water. This may have enhanced erosion of the naturally unstable black cotton soil around the foundations of the toilet facilities and caused the damage. The bridges and culverts that were constructed have generally ensured the smooth movement of people, livestock, and goods during the evacuation, as originally designed. Regarding the non-structural measures, it was difficult to statistically establish the status of CFMOs due to the limitations of time-series data as described under “Constraints on Evaluation” above. However, based on interviews of current CFMO members (Kamuga, Komwaga, and Wasiese), community members (Oyola, Nyachoda, and Kojunga), and schoolteachers (Mowlem, Kamuga, Oyola, and Achuodho), it was evident that the non-structural measures implemented under the project made long-lasting positive impressions on the communities such that they internalized the essence and could flexibly and independently use the knowledge gained as required. This was the result of continued community flood management training within the community, as was observed during the recent case of massive flooding in 2020. Furthermore, WRA and the Kenya Meteorological Department, in tandem with the local administration authorities and the local radio stations, have all continued to provide flood early warnings in the region.

<Impact>

The project has contributed to sustainable economic growth and poverty reduction through the CBFMS introduced by the project. Some evacuation centres and storage facilities are additionally used to provide essential services to the communities. Considering that floods increase the risks of water-borne as well as vector-borne communicable diseases (e.g. typhoid fever and malaria, etc.), the facilities have been used for related and emergency health care services arising from flood incidences (Komwaga, Kowiti, and Kanyilum). In some cases, they have also been used for educational purposes (Mowlem and Kamuga). The County Government has also created synergies with the project synergized its activities with the project’s by improving road conditions and drainage in some areas. In terms of culvert maintenance, the Kenya Rural Roads Authority (KeRRA) and Constituency Roads Committees (CRC) are the most appropriate entities to undertake this responsibility. At the same time, the National Irrigation Authority (NIA) has been implementing an irrigated rice cultivation scheme that also serves to divert runoff and reduce the risk of flooding. From interviews during the field survey, it was reported that there were no deaths from floods in the communities since 2012 due to the adoption of early warning systems by the communities.

There were no resettlements and land acquisition associated with the project. Also, no negative impact on the natural environment was observed.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is fair.

Quantitative Effects

Indicators	Baseline 2008 Baseline Year	Target	Actual				Source
		2011	2011 Completion Year	2019 8 Years After Completion	2020 9 Years After Completion	2021 10 Years After Completion	
Total number of registered CFMO members	0	10,000	720 (As of June 2011)	NA	NA	NA	Ex-ante evaluation sheet Final Report on the implementation of non-construction works
Total number of people using the evacuation centers constructed by the project	0	320	NA	NA	NA	NA	Ex-ante evaluation sheet
Total number of people using the wells constructed by the project	0	5,000	NA	NA	NA	NA	Ex-ante evaluation sheet

Total number of pupils in which flood management lessons were conducted	0	2,693	2,810	NA	NA	NA	Ex-ante evaluation sheet Final Report on the implementation of non-construction works
The number of radio programs on flood management	0	10	10	NA	NA	NA	Ex-ante evaluation sheet Final Report on the implementation of non-construction works
Total number of participants of the evacuation drill	0	--	7951	NA	NA	NA	Final Report on the implementation of non-construction works
The number of participating teachers in training on disaster prevention and flood management	0	--	49 (16 schools)	NA	NA	NA	Final Report on the implementation of non-construction works
<Supplementary indicator> (Impact) The number of affected people by floods in the project sites				600	1,500	10	WRA response to the Questionnaire and interview.
<Supplementary indicator> (Impact) The number of deaths caused by floods in the surveyed communities				0	0	0	Field survey interview

3 Efficiency

Although the project cost was as planned (ratio against the plan: 100%), the project period exceeded the plan because of the delay in the tax exemption procedure (ratio against the plan: 125%). The outputs were produced as planned. Therefore, the efficiency of the project is fair.

4 Sustainability

< Institutional/Organizational Aspect>

There has been a series of relevant policies, plans, and strategies to enhance resilience and adaptation to climate change, e.g. “National Climate Change Policy Framework”, “National Climate Change Action Plan” (2018-2022), and the “Water Resources Authority Strategic Plan” (2018-2022). These documents have essentially justified the need for dedicated staffing and a comprehensive O&M system to support the communities in a sustainable manner. However, CFMOs, which played an important role in the project, are not specifically mentioned in the Water Act.

Regarding the organizational aspect, CFMOs are responsible for O&M of the facilities constructed such as boreholes, culverts, footbridges, weirs, and evacuation centers. In case CFMOs encounter O&M challenges, WRUAs take the initiative to support them in cooperation with related organizations. WRA’s staffs who were trained in the project continue to work in flood-prone areas in sufficient numbers to maintain the facilities and provide support to WRUAs.

<Technical Aspect>

WRA has institutionally trained staff with a set of manuals for flood management in a comprehensive manner. WRA has also effectively incorporated flood management into its “Sub-Catchment Area Management Plans”. For example, WRA staff members have engaged in flood vulnerability mapping, data collection/analysis, and post-flood monitoring and evaluation in order to align flood management with their training program, which has been maintained without problems with respect to technical aspects. CFMOs also have been able to implement non-structural measures such as O&M of the facilities and radio programs on flood management wherever possible, despite the limited budget allocation from WRA.

<Financial Aspect>

WRA has a limited budget to support WRUAs for O&M of the facilities established under the project and has not been financially structured to support CFMOs. Financing methods for O&M costs for flood management structures vary depending on factors such as the population size, demographic structure, available resources and priorities, and each community has its own way of dealing with these issues. For instance, primary schools in Mowlem, Kamuga, and Achuodho have allocated part of their schools’ budget for O&M of the evacuation centre. In the case of Oyola, the community and the school have both provided funds for O&M of the evacuation centre. In Mowlem also, the school has been maintaining the toilets of the evacuation centre with support of the community. In Komwaga and Kowiti, the evacuation centre and storage facility have been serving the functions of a health centre so the County Government’s has utilized its health sector budget to maintain them. Similarly, the storage facility at Kanyilum has also been used as a healthcare clinic whose activities are supported by USAID.

<Current Status of Operation and Maintenance>

Most of the facilities established through the project have been maintained and continuously utilized. it was confirmed that primary schools in Mowlem and Achuodho have planned maintenance activities and regularly procured spare parts and consumables for boreholes in a timely manner. However, appropriate implementation of procurement of boreholes’ spare parts is dependent on the social and natural conditions in each community. For example, Kisumu water company has provided piped water in Kamuga, so the community has very little incentive to contribute to the maintenance of the borehole. Also, at Kanyilum, the water gradually turned very saline to the extent that the borehole is no longer utilized at all although the reasons for this are not clear.

<Evaluation Result>

Some minor problems have been observed in terms of the institutional/organizational and financial aspects. Therefore, the sustainability of the project effects is fair.

5 Summary of the Evaluation

The project partially achieved its objective to establish CBFMS at the project sites. Regarding sustainability, there have been some institutional and financial issues in terms of wide dissemination of this system in the Nyando river basin. As for efficiency, the project period exceeded the plan.

Considering all of the above points, this project is evaluated to be partially satisfactory.

III. Recommendations & Lessons Learned

Recommendations to Executing Agency:

- There has been a series of relevant policies, plans, and strategies in place to support communities and these documents have essentially justified the need for dedicated staff and a comprehensive O&M system. However, CFMOs, which played an important role in the project, are not specifically mentioned in the Water Act. In order to further strengthen organizational and financial aspects, it is necessary

to specify the legal status of CFMOs including amendments to relevant laws and regulations, and also to consolidate the implementation system.

- To enhance the sustainability of the project through the promotion of CFMOs, it is imperative to have WRUAs cooperation and support. As a first step, it would be very constructive to incorporate community-based activities led by the CFMOs into WRUAs' agenda and action plans; e.g., updating flood hazard maps with corresponding signboards and implementing thorough evacuation drills in each community in the flood-prone areas.
- To enhance the impact of the project through dissemination of the CBFMS, it is recommended to distribute all the relevant manuals of flood management to WRUAs, Development Partners, and NGOs and to conduct activities related to CBFMS in collaboration with them. For example, one idea would be to share training materials including a teacher training manual/guidebook on flood management with local schools, so that the schools can deepen their understating of the importance of disaster prevention education and community flood management, and incorporate the training in their teaching programs. At the same time, in order to increase sustainability through local ownership of the project's activities, WRA should closely collaborate with the County Government in terms of capacity development for flood management through meetings, seminars, workshops and joint site inspection visits.
- No clear cause has been identified for extremely high salinity levels in the borehole at Kanyilum. In order to properly understand such phenomenon for the sake of future interventions, WRA should not only regularly carry out ground water quality testing from boreholes, but also monitor and periodically assess the status of land use that may affect groundwater recharge. In addition, the results should be shared with JICA for its future project.

Lessons Learned for JICA:

- The site survey reveals that in varying degrees, the CFMOs have gradually become dormant and have not been operating as cohesive units over time. Due to the transfer of counterpart staff at WRA who participated in the project, and considering that WRA has not been officially mandated to directly support CFMOs, the institutional memory of the project has been substantially lost including strong contact between WRA and the CFMOs. The institutionalization of project activities could have been better achieved if WRA had specifically considered and proposed revisions to the legal framework, which provides for WRA to assume an important administrative role in overseeing community flood management organizations or if a post-project monitoring system for CFMOs formulated under the project including other stakeholders, and a concrete plan for incorporating CFMOs into WRUAs was devised. This would have enhanced sustainability regardless of whether key project counterpart personnel were transferred or not, and may have been reflected in WRA's Strategic Plan in the longer term.
- The evacuation centres established under the project have been used not only for disaster management but also for multiple purposes, such as providing basic medical services to the community as required. This has led to a positive impact that was not initially envisaged, such as improved access to medical services, as well as improved disaster management. In addition, the evacuation centres, that also served as health centres, were able to receive financial support for O&M of the facilities from the County Government's health sector budget and donor health projects. Therefore, from the perspective of sustainable maintenance of facilities, it is important for JICA to closely collaborate and share information with stakeholders (National and County Governments, local authorities, NGOs, donors, etc.) who are interested/involved in solving development issues of local communities in future similar projects, right from the project formulation stage. It is also advisable to consider the possibility of effective utilization and multi-purpose use of project facilities.



Nurse treating a patient at Komwaga Evacuation/Health Centre.



Pupils using a borehole and washing their lunch dishes at Rae-Kanyaika Primary School in Mowlem.