Chapter 6 Pilot project at the Lower Lumi Sub-Catchment

This chapter explains the activities which were conducted in Lower Lumi Sub Catchment in conjunction with WRMA and they were as follows:

- Selection of pilot area
- Implementation plan of pilot project
- Respective roles of the organizations concerned for implementing pilot community based structural activities
- Preparation and contract of construction work
- Implementation of pilot community based structural flood management activities
- Monitoring and evaluation of pilot community based structural flood management activities

6.1 Selection of Pilot Area and Pilot Project

For selection of Pilot Area and Pilot Project in Lumi Sub-catchment, WRMA and the project team considered the some appropriate draft project types and then held the "IFMC" meeting in order to discuss this matter with the stake holders in Lumi river basin. Through this procedure, the project type is selected.

After this, concerning the pilot area to be applied the selected project type, WRMA and the project team considered the most appropriate plan by comparison of some plans. WRMA and the project team explained the most appropriate plan to WRUA and the communities in the relevant area. And then consensus was built and pilot area and pilot project were selected.

6.1.1 Flood Management Structural Measures to be implemented in the IFMP

In the IFMP, a long list of flood management countermeasures was prepared, thereafter the countermeasures were prioritized, emergency and preparation period for investigation was done, land survey and consultation with relevant stakeholders were considered, and the implementation time schedule in five-year plan was prepared.

6.1.2 Analysis on Flood Damage and Countermeasure

(1) Analysis on Flood Damage and Countermeasure for Earth and Soil Flown Out Area in the Upstream of Lumi River Basin

Based on the field survey done by this time, flood damage in the upstream of Lumi River was analyzed using by logic tree.

Damage on agriculture is occurred in the middle to upstream of Lumi River. Damage on agriculture is mainly caused by debris flow and soil erosion.

To derive the countermeasures, objective tree analysis was carried out. The result is shown on the following figure. Issues to be solved are placed on the left side and the measures are specifically presented

Irrigation canal broken down by flash flood from lateral face

therefrom.

Many flash floods occur during rainy season in the middle to upstream of Lumi River. Flash flood brings about a lot of damages inducing debris flow. To prevent flowing out of debris flow, Check dam is considered as a countermeasure. On the other hand, damage on soil erosion becomes a serious issue. Flowing out of earth and soil causes irrigation pond to be buried by soil erosion, and this induces another issue to lose the primary function of the irrigation pond. To cope with this issue, strengthening of soil by restriction of logging, forestation activity, etc. is considered effective.

Check Dam
(Example of Nzoia River)

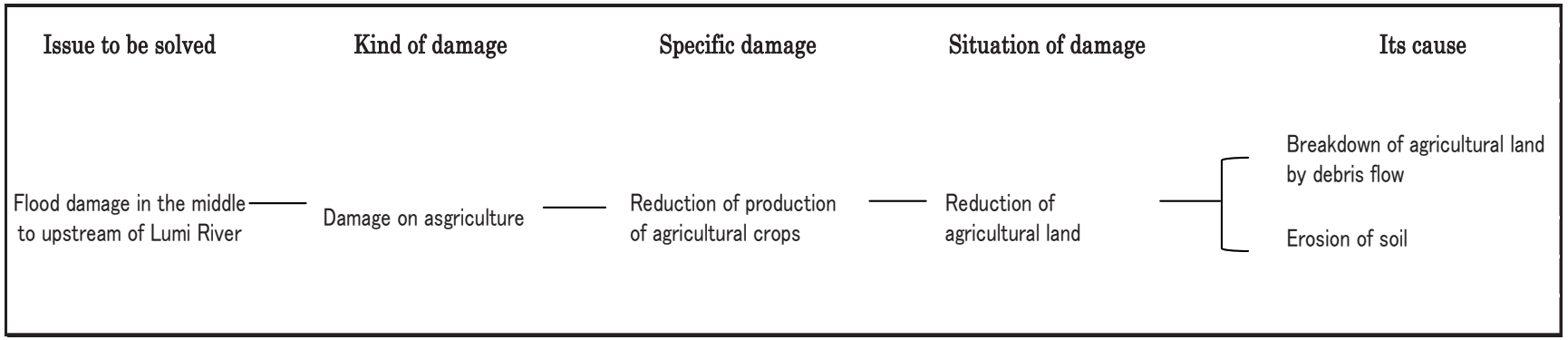


Fig. 6.1-1 Analysis on Problem Tree

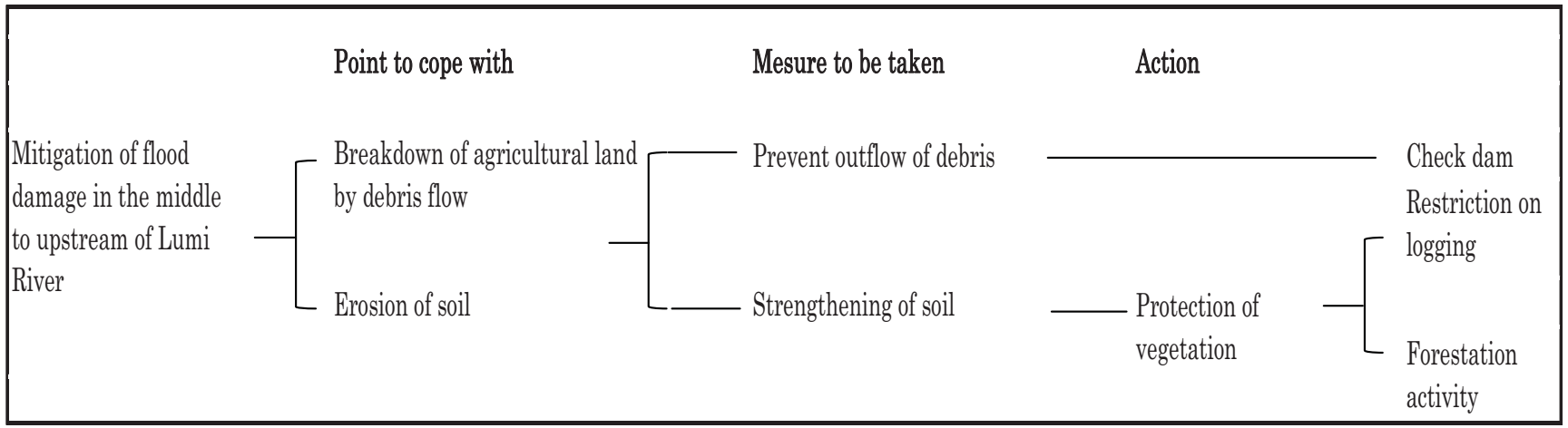


Fig. 6.1-2 Analysis on Objective Tree

Countermeasure method to be considered for this area is summarized below.

Table 6.1.1 Countermeasure Method to be considered in the Earth and Soil Flown Out Area in the Upstream of Lumi River Basin

Serial No.	Countermeasure Method to be considered	Remarks
L-U1	Check dam	Preventing the outflow of debris
L-U2	Restriction on logging	Preventing the excess tree cutting.
L-U3	Forestation activities	Raising nursery trees and planting on slope.

(2) Analysis on Flood Damage and Countermeasure in the Long-term Inundated Area of the Downstream of Lumi River

Based on the result of field survey by this time, analysis was carried out on the area where damage occurred by the long-term inundation of the downstream of Lumi River using by logic tree.

Fig. 6.1-3 Analysis on Problem Tree

Long-term inundation brings about damage and loss of agricultural land and livestock in this area. Besides, houses and infrastructures are largely damaged and submersion of houses and road under water also occurred. This gives an impact to the life and living of the residents.

To derive the countermeasure, objective tree analysis was carried out. The result of analysis is shown on the following figure. Issues to be solved are placed on the left side and the measures are specifically presented therefore.

Condition at the time of flooding

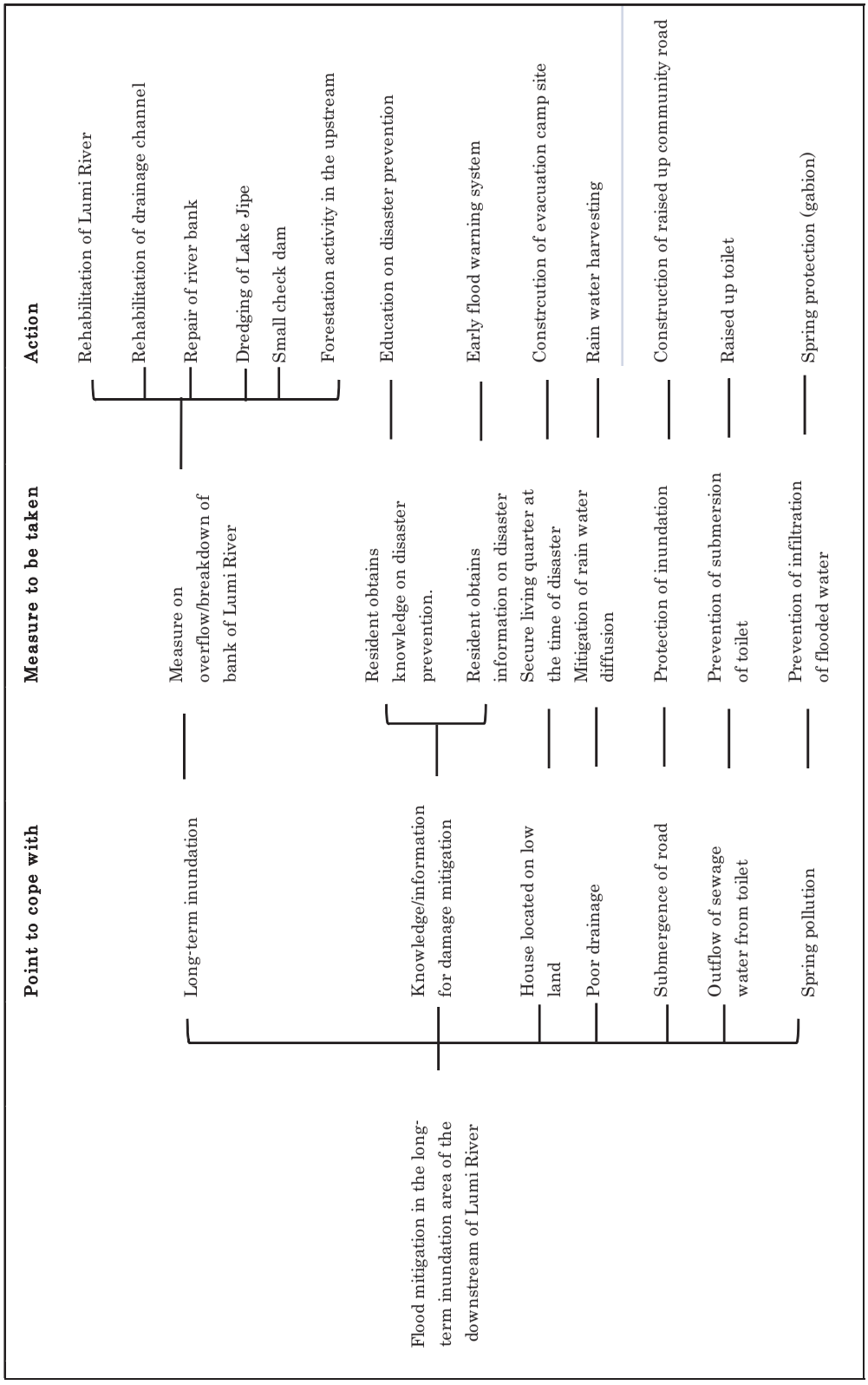


Fig. 6.1-4 Analysis on Objective Tree

Inundation in this area has various impacts such as pollution of drinking water by interfusion of flooded water to the spring, damage to houses and living of the residents. For instance, severed road by inundation will make students go to school and agricultural products to deliver to the market impossible. In addition, as the access to the hospital becomes impossible, another issue will occur where by the resident cannot have medical service. Furthermore, as the residents have little knowledge and information to reduce damages, the damages becomes larger such as to drown livestock. To reduce the flood damage, it is considered an effective mean that the residents acquire knowledge and information on disaster prevention and devise countermeasure by themselves. As countermeasures, education on disaster prevention at school, early flood warning system, etc. are considered. Further, to force an end of inundation from Lumi River, the countermeasures such as widening of and improvement by dredging, etc. of Lumi River, improvement of the existing drainage canal in low-lying area and dredging of Lake Jipe to improve the storage capacity are considered. There are three major existing drainage canals of Canal A, Canal B and Canal C. It is considered to reduce the flood damages largely by heighten the flow capacity of these Canal A, Canal B and Canal C by way of dredging and improvement. Especially, though the bank of Canal C is partly broken down at present, it is one of the options to rehabilitate the bank.

Road Bridge rushed out

Damp ground where the bank of Canal-C has been washed out

Besides, there are many residents forced to evacuate in the long-term inundation area of the downstream of Lumi River because the inundation is prolonged, the houses are impossible to reside and the houses are washed out. Assurance of living quarter is important for victims of flood, therefore, construction of evaluation camp is considered as a countermeasure. There is an existing place being utilized as evacuation camp site, however, the facility is not well constructed. Therefore, it is considered appropriate to improve the existing evacuation camp. Countermeasure method to be considered for this area is summarized below.

Evacuation camp site

Place : Kimorigo

Land elevation after inundation of house

Place : Rengesa

Table 6.1.2 Countermeasure Method to be considered in the Downstream of Lumi River and Long Term Inundation Area

Serial No.	Countermeasure Method to be considered	Remarks
L-W1	Improvement of Lumi River	Implement at the place where the overflow occurs frequently in the downstream of Lumi River.
L-W2	Improvement of Drainage	Dredging of the existing Canal A/B/C.
L-W3	Repair of Bank	Repair the bank of gateway of Canal C which is broken down.
L-W4	Dredging of Lake Jipe	Remove earth and soil deposited to increase the reservoir capacity of Lake Jipe.
L-W5	Small check dam	Restrain silting and rising of riverbed.
L-W6	Forestation Activity in upstream	Activity to promote plantation and forestation.
L-W7	Education on Disaster prevention	Educate the residents on how to reduce the current flood damage by themselves
L-W8	Early Flood Warning System	Deliver information to the downstream area after gathering and analyzing information on flood such as rainfall, etc. in the upstream of Lumi River Basin.
L-W9	Construction of Evacuation Camp	There is an existing camp site in the downstream of Lumi River. Expand the evacuation camp facility.
L-W10	Rain water harvesting	Distributing the rain water storing by using roof, gutters and tank.
L-W11	Development of Raised Up Community Road	Raising elevation of Community Road in the long term inundation area of the downstream of Lumi River.
L-W12	Raised up toilet	Implementation of raising elevation and guidance.
L-W13	Spring protection (gabion)	Installation of gabion nearby spring

(3) Tributary Area in the Downstream of Lumi River

Based on the result of field survey by this time, analysis was carried out on this area using by logic tree, too. Its result is shown in the following figure.

Fig. 6.1-5 Analysis on Problem Tree

In the tributary of downstream of Lumi River, flood damages occur such as washout of land along the river, flowing out of soil, loss of livestock and agricultural products, damages on houses and infrastructures, deterioration of sanitary environment by spreading of human waste, etc. Major reasons of those are considered to be erosions of river bank and soil, lack of knowledge and information to reduce flood damages, structure of houses and infrastructure not considering floods, submersion of toilet, etc.

Wash out of land by bank erosion of seasonal river
Place: Rekeke

In the tributaries of the downstream of Lumi River and the small rivers directly flowing into Lake Jipe, the river bank is eroded by flash flood, and damages on agricultural land and housing lot are occurred by washout of land. It is supposed to be that the rainfall in the upstream swells the dry up river (seasonal river), where normally there is no water in the narrow river course, into flash flood with erosion of river bank. Besides, the area was covered by trees once. However, as the trees were logged as fuel wood materials, there are only scattered trees in the area at present. Therefore, if there is a heavy rain, the rainfall directly hits the surface soil, and it results in washout of soil.

Agricultural land of which the surface soil has been washed out by flood

Place : Kimala Irrigation Scheme

Damage to living is also large, for example, cribs such as chicken house, etc. are hit and submerged by flash flood, and livestock is drowned. Agricultural products are also lost by inundation. Breakage of houses and infrastructures, especially, transportation infrastructure such as roads and bridges by flood is remarkable in this area. This is largely because, in planning, design, construction, operation and maintenance of houses and infrastructures, floods are not considered and the people do not know the proper material and method.

Damages on toilet often induce sanitary issues. Toilet in this area is mainly constructed by digging a hole on the ground and surrounded by wall and roof. These toilets are submerged under water at the time of flood and the human waste is flown out. Sanitary environment is deteriorated and this causes various waterborne diseases like Cholera, etc.

To derive the countermeasures, issues to be solved are placed from the left side and the measures are specifically presented.

Forestation by KRCS Volunteer Group

(Planting nursery tree)

Place : Rekeke

Toilet left as being buried by sedimentation by flood
Place: Rekeke

Fig. 6.1-6 Analysis on Objective Tree

For countermeasure on washout of land along the river, construction of bank for protection from river bank erosion is considered as a short-term measure. However, since the maximum discharge at the time of flood is impossible to be estimated, adoption of these measures shall be limited to the area where very important facility is built nearby the dry river.

For washout of soil, it is considered, as one of the methods, to reforest for the purpose of protection and development of forest and trees. In fact, it may not be difficult as the forestation activity is carried out in the downstream of Lumi River by the volunteer group organized by Red Cross of Kenya. Forestation requires time to heighten an effect, however, as an impact to the environment is quite small or few, it is ideal to promote as much as possible as a countermeasure to be adopted by the community level.

Chicken House

Regarding loss of livestocks and agricultural products, lack of knowledge and information to reduce damage by resident level becomes obstacles. For instance, chicken house is constructed directly on the ground though it is submerged every year by flood. Accordingly, chickens are easily drown by the inundation caused by flood. There is a possibility to reduce damages by raising elevation of chicken house not to be submerged under water like the south east Asian countries where many floods hit every year. It is quite important that the residents shall have such a knowledge for reduction of damage, and minimizing the flood damage will largely contribute to the recovery of living after flood damage.

Washout of the concrete bridge of the same structure to the above by flash flood
Place : Rengesa

Regarding damage on house and infrastrcucture, the structure not considereing the flood is considered problematic. Concrete bridge shown on the right photo crossess over the dry river and the water passess through the pipe culvert. However, the diameter and the number of pipe culvert seem to be rather small to cope with the discharge during flood. Method to estimate the discharge during flood is not established in Kenya. Therefore, especially the open channel of the bridge often does not secure enough cross section to discharge flood safely to the downstream. Countermeasure for these damages is to establish a calculation method of flood discharge in this area and to recommend the adoption of method to the parties concerned who construct the road and bridge. Further, the elevation of road surface is also often

Bridge with pipe culvert installed at the dry up river crossing the road

determined lower than the inundation level by the flood, therefore, it is considered necessary to install proper size of culvert and to raise the elevation of surface of the road.

Regarding deterioration of sanitary environment by overflowing of toilet, it is recommended to raise the elevation of toilet as implemented in Nyando River Basin. To raise the elevation of toilet has already been implemented in part of this area. Therefore, it is necessary to enlighten the resident's mind by introducing such an example.

Considering the above, countermeasure method to be considered is summarized below.

Table 6.1.3 Countermeasure Method to be considered in the Flash Flood Occurrence Area of Tributary in the Downstream of Lumi River

Serial No.	Countermeasure Method to be considered	Remarks
L-E1	Bank Protection	Implementation of gully at the right place near Rekeke.
L-E2	Restriction on land use	Clarification on riverbank regulation
L-E3	Forestation Activity	Activity to promote plantation and forestation.
L-E4	Education on Disaster Prevention	Educate the residents on how to reduce by themselves the present flood damage.
L-E5	Early Flood Warning System	Supposing a system utilizing the simple measurement and communication method which is considered to be adopted by WRUA and WRMA.
L-E6	Construction of Community Road	Raising elevation of community road in the soil and river bank erosion areas of the downstream of Lumi River.
L-E7	Raised up Toilet	Implementation of raising elevation and guidance.

6.1.3 Long list/candidates of Countermeasures to the Flood

Long list/candidates of countermeasures to the flood are presented as below

Table 6.1.4 Countermeasure Long List

No.	Countermeasure	Structural/ Non-structural
L-U1	Check dam / Earth and Soil Flown Out Area in the Upstream of Lumi River Basin	S
L-U2	Restriction on logging / Earth and Soil Flown Out Area in the Upstream of Lumi River Basin	N
L-U3	Forestation activities / Earth and Soil Flown Out Area in the Upstream of Lumi River Basin	N
L-W1	Channel Improvement of Lumi River / Long term inundation area	S
L-W2	Drainage Channel Improvement / Long term inundation area	S
L-W3	Repair of existing embankment / Long term inundation area	S
L-W4	Dredging of Lake Jipe / Long term inundation area	S
L-W5	Small check dam	S
L-W6	Forestation Activity (upstream) / Long term inundation area	N
L-W7	Education on Disaster Prevention / Long term inundation area	N
L-W8	Early Warning System (IFAS/GFAS) / Long term inundation area	S
L-W9	Environmental Improvement of Evacuation Camp / Long term inundation area	S
L-W10	Rain water harvesting	S
L-W11	Development of Community Road/ Long term inundation area	S
L-W12	Raised-up Toilet / Long term inundation area	N
L-W13	Spring protection (gabion)	N
L-E1	Bank Protection / Tributary Stream Area	S
L-E2	Restriction on land use	N
L-E3	Forestation Activity / Tributary Stream Area	N
L-E4	Education on Disaster Prevention / Tributary Stream Area	N
L-E5	Early Warning System / Tributary Stream Area	S
L-E6	Development of Community Road / Tributary Stream Area	S
L-E7	Raised-up Toilet / Tributary Stream Area	N

S: Structural, N: Non-Structural

6.1.4 Selection of Flood Damage to be Prevent Preferentially

(1) (1) Priority by WRUA Members

In Lumi River Basin, the workshop was held to analyze the problems in Lower Lumi sub catchment with WRUA members, WRMA-SRO staff and JICA project team members on Nov. 2nd, 2012

As a result of analysis, the causes of flood are pointed out as bellow.

Table 6.1.5 Analysis for the causes of flood by interviewing to WRUA Members

Theme	Causes	Principal Influence from Flooding
Floods (Upstream)	Rainfall around the Mt. Kilimanjaro slope	Flash Floods
	Sediment flow from Mountain slope	
Floods (Downstream)	Rise of east side Wadi river apart from the Lumi river	Flash Floods around tributary
	Sediment flow around upstream →Raised bed river	Flooding by long term inundation
	Bank erosion →Newly generation of river course	River course diversion

Concerning flood damages, following analysis was done and was indicated the priority order lead by WRUA members

Table 6.1.6 Damage Analysis and Priority by WRUA Members

Priority by WRUA members	Type of Damage	Primary Damage	Secondary Damage
①	Soil erosion (Middle stream)	- Sediment outflow to downstream	- Raised up the river bed (Lumi river,Lane Jipe)
	Soil erosion (Downstream)	- Destruction of farmland	
②	Submersion	- Submersion and destruction of houses - Farmland damage	- Evacuation - Suspending educational activities - Income decreasing - Food shortage
③	Polluted water resource	- Pollution of springs	- Water shortage - Drought
④	Damage of infrastructures	- Cutting roads between (Eldoro and Taveta / Taveta and Kitobo / Taveta and Jipe) - School	- Unable to get commodities - Unable to transport
⑤	Lives	- Livestock - Human (Rare case)	

6.1.5 Selection of Flood Damage to be prioritized

The flood damages in Lumi river basin is principally classified 3 types such as A) Soil and sediment run off (Upper and middle river basin), B) Widespread and long-running inundation which is caused by overflow and dyke break from the Lumi River (Low-lying area at the lower river basin) and C) Flash flood (Branches of the Lower Lumi River and small streams flow in the Lake Jipe).

Based on the evaluation of flood damages by communities previously described, each impact from flood damages are evaluated from the viewpoints of social impacts as “Number of affected people and houses” or economic impacts as “Losses of merchandise, agriculture, transportation and sightseeing industry”, and are shown in the following table.

Table 6.1.7 Selection of The Flood Damages Should Be Corresponding Preferentially

Flood type	Social impacts		Economic impact				Priority order
	Number of affected people	Number of affected houses	Merchandise	Agriculture	Transportation	Sight-seeing industry	
A) Soil and sediment run off	Low	Low	Low	**High**	Mid	Mid	Low
B) Widespread and long-running inundation which is caused by overflow and dyke break from the Lumi River	**High**	**High**	Low	**High**	**High**	**High**	High
C) Flash flood	Mid	Mid	Mid	Mid	**High**	**High**	Slightly high

In the 3 types of flood damages, it shows that the damage by "A) Soil and sediment run off" has strongest impacts socio-economically, and next is the damage by flash flood along tributaries. The damage by "Soil and sediment run off" in upstream to midstream has impacts to agriculture but the impacts to socio-economic matters is not so high, and then the priority is low. The measure to reduce the soil erosion and sediment outflow should implement in long term perspective because it takes long time to be given the effects.

According to these review, in Lumi river basin, "Widespread and long-running inundation which is caused by overflow and dyke break from the Lumi River" is selected as the damage should be corresponding preferentially, and subsequently the flash flood.

Therefore, selected long list is shown in the next page.

Table 6.1.8 Selected Long list of the Countermeasures to the Flood in Lumi River Basin

No.	Countermeasure	Structural/ Non-structural
L-W1	Channel Improvement of Lumi River / Long term inundation area	S
L-W2	Drainage Channel Improvement / Long term inundation area	S
L-W3	Repair of existing embankment / Long term inundation area	S
L-W4	Dredging of Lake Jipe / Long term inundation area	S
L-W5	Small check dam	S
L-W6	Forestation Activity (upstream) / Long term inundation area	N
L-W7	Education on Disaster Prevention / Long term inundation area	N
L-W8	Early Warning System (IFAS/GFAS) / Long term inundation area	S
L-W9	Environmental Improvement of Evacuation Camp / Long term inundation area	S
L-W10	Rain water harvesting	S
L-W11	Development of Community Road/ Long term inundation area	S
L-W12	Raised-up Toilet / Long term inundation area	N
L-W13	Spring protection (gabion)	N
L-E1	Bank Protection / Tributary Stream Area	S
L-E2	Restriction on land use	N
L-E3	Forestation Activity / Tributary Stream Area	N
L-E4	Education on Disaster Prevention / Tributary Stream Area	N
L-E5	Early Warning System / Tributary Stream Area	S
L-E6	Development of Community Road / Tributary Stream Area	S
L-E7	Raised-up Toilet / Tributary Stream Area	N

S: Structural, N: Non-Structural

6.1.6 Evaluation of Countermeasures to the Flood

(1) (1) View Point of Evaluation

Candidate countermeasures that are extracted in last chapter are studied in detail. On the basis of the result of last chapter, 5 criteria; relevance, effectiveness, efficiency, impact and sustainability is considered.

The project team defined 5 criteria as the description on following table, and then evaluated the countermeasures by marking “A”, “B” and “C” according to these 5 Items.

Table 6.1.9 Definition of 5 Items for Pilot Project Selection

1	Relevance	Requirements from the stakeholders, Needs of target area Dimension of economic damage and human suffering.
2	Effectiveness	Degree of damage mitigation (Number of beneficiary, Reduction of submergence period, area and number of affected people)
3	Efficiency	Cost effectiveness (It is evaluated by estimated qualitative dimension and degree of damage mitigation)
4	Impact	Spreading effect within a same basin or to other areas Indirect effects
5	Sustainability	Sustainability of maintenance and project effects (On the assumption of pilot project completion according to the design.)

*The project team defined these 5 items for the purpose of this study according to "DAC's evaluation 5 items"

6.1.7 Result of the Evaluation on 5 Criteria

Following figure shows evaluation on 5 criteria of all candidate measures. It is preferable to implement from high scored to low scored measures. However, schedule some of them require long term coordination and negotiation. JICA project team studies. Table 6.1.21 Evaluation List of 5 criteria

Table 6.1-10 Evaluation List of 5 criteria

Structural/ Non-structural	No.	Countermeasure	Score
Structural Measure	L-W3	Repair of existing embankment / Long term inundation area	12
	L-W12	Raised-up Toilet / Long term inundation area	12
	L-E7	Raised-up Toilet / Tributary Stream Area	12
	L-W9	Environmental Improvement of Evacuation Camp / Long term inundation area	12
	L-W11	Development of Community Road / Long term inundation area	11
	L-W2	Drainage Channel Improvement / Long term inundation area	11
	L-E6	Development of Community Road / Tributary Stream Area	11
	L-W13	Spring protection (Gabion) / Long term inundation area	10
	L-W4	Dredging of Lake Jipe / Long term inundation area	10
	L-W1	Channel Improvement of Lumi River / Long term inundation area	10
	L-E1	Bank Protection / Tributary Stream Area	9
	L-W5	Small check dam / Long term inundation area	9
	L-W10	Rain water harvesting / Long term inundation area	8
Non-structural Measure	L-W7	Education on Disaster Prevention / Long term inundation area	14
	L-E4	Education on Disaster Prevention / Tributary Stream Area	14
	L-E5	Early Warning System / Tributary Stream Area	13
	L-W8	Early Warning System / Long term inundation area	13
	L-W6	Forestation Activity (upstream) / Long term inundation area	11
	L-E3	Forestation Activity / Tributary Stream Area	11
	L-E2	Restriction on land use / Tributary Stream Area	11

The long list of structural countermeasures was as follows:

1) Environmental Improvement of Evacuation Camp
2) Raised-up Toilet
3) Repair of existing embankment
4) Development of Community Road
5) Drainage Channel Improvement

6) Spring protection (Gabion)
7) Channel Improvement of Lumi River
8) Dredging of Lake Jipe
9) Small check dam
10) Bank Protection
11) Rain water harvesting

Among these countermeasures, "7) Channel improvement of Lumi river" and "8) Dredging of Lake Jipe" seems to take a long period in order to conduct large scale topographic survey on river channel and lake and to make a study on hydrological and hydraulic analysis. Moreover, there is a possibility of resettlement. Therefore, consultation with residents seems to become long. It is clearly impossible to implement these two countermeasures within the Project period. Therefore, these two candidates shall be eliminated as a pilot project.

Table 6.1-11 Draft Time Schedule of Structural Measures in Lumi River Basin

	Countermeasures	Required Preparation	Main Actor	Support Actor			WRMA's role	WRUA's role	1st year	2nd year	3rd year	4th year	5th year	6th year or later
				NGO	Administrative Authority	Techinical Authority								
Structural Measure	Environmental Improvement of Evacuation Camp		WRUA	KRCS	County/District/Ministry of Education	MWI, WRMA	techinical advice	planning/construction/operation/maintenance						
	Raised-up Toilet		WRUA/Community/Individual		County/District/Ministry of Public Health	MWI, WRMA	techinical advice	planning/construction/enlightenment activity						
	Repair of existing embankment	Study/Survey/Discussion	NWCPC or County		County/District	MWI, WRMA	coordination with related ministries	planning/maintenance	Study/Survey/Discussion					
	Development of Community Road	Study/Survey/Discussion	WRUA		County/District/Ministry of Road/KeRRA	KeRRA, MWI, WRMA	techinical advice	planning/construction/maintenance		Study/Survey/Discussion				
	Drainage Channel Improvement	Study/Survey/Discussion	NWCPC or County		County/District	MWI, WRMA	coordination with related ministries	planning/maintenance		Study/Survey/Discussion				
	Spring protection (Gabion)		WRUA		County/District、MWI, WRMA	WRMA	techinical advice	planning/construction/maintenance						
	Channel Improvement of Lumi River	Study/Survey/Discussion	NWCPC or County		County/District	MWI, WRMA	coordination with related ministries	planning/maintenance			Study/Survey/Discussion			
	Dredging of Lake Jipe	Study/Survey/Discussion	NWCPC or County		County/District	MWI, WRMA	coordination with related ministries	planning/maintenance			Study/Survey/Discussion			
	Small check dam	Study/Survey/Discussion	NWCPC,MWI or County		County/District、MWI, WRMA	MWI, WRMA	techinical advice	planning/construction/maintenance		Study/Survey/Discussion				
	Bank Protection	Study/Survey/Discussion	WRUA		County/District、MWI, WRMA	MWI, WRMA	techinical advice	planning/construction/maintenance			Study/Survey/Discussion			
	Rain water harvesting	Study/Survey/Discussion	Town council,/WRUA		Town council	MWI, WRMA	techinical advice	planning/construction/maintenance		Study/Survey/Discussion				

6.1.8 Methodology of Evaluation of Flood Countermeasures as Pilot Project

It was decided that the basic policy for selection of the pilot project in this project was that countermeasures which main actor is WRUA or communities and which is categorized as mutual support shall be selected among the shortlisted countermeasures.

Table 6.1-12 Evaluation axis and focused points for feasibility as a pilot project

Evaluation axis	Focused points
Feasibility by WRUA	➢ Can WRUA be a main actor of the project? ➢ Can it be implemented by community level?
Project duration period	➢ Is it possible to complete within a term of SCMP that are formulated in 3 to 5 years? ➢ Is it possible to be completed within this project?
Expenditure for the project	➢ Can the budget be obtained through SCMP scheme? (Under 5 mil. Ksh) ➢ Can it be implemented under the budget provision of this project?

6.1.9 Evaluation Results of Flood Countermeasures as Pilot Project

Evaluation results for each of the flood countermeasures as a pilot project are shown as follows;

Table 6.1-13 Structural Measures Evaluation Result as a Pilot Project (1)

Target Area		**Long term inundation area / Downstream of Lumi River**		
Countermeasure (Project)		**Environmental Improvement of Evacuation Camp**		
Outline		It is to enhance and improve existing evacuation Camp during flood.		
Image				
Merit		Since this matter is an improvement of existing evacuation camp, It will be easy to implement.		
Demerit		Continuous maintenance Necessary for land acquisition.		
Environmental Negative Impact		Nil		
Necessity of EIA		Unnecessary		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labour or materials.		
Main Actor		WRUA		
Supporting Actor		**Administrative Authority:** County/District, Ministry of Education (in case school compound is used for) **Technical Authority:** MWI, WRMA **Other:** KRCS		
Public assistance/ Mutual support /Self-help		Mutual support		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	Even if the main actor is WRUA, they can implement the small-scale project through the SCMP and WSTF fund.	A	3
	Project Term	Few months are required for the implementation. There is a possibility to implement within term of PCDEM project, depending on the scale.	B	2
	Project Budget	It is possible to implement with WSTF fund or budget of PCDEFM project.	A	3
Relevance with PCDEFM Project・Total				8
Comment		There are existing evacuation centers in this area. Application is effective and in demand. The method that facilities necessary for evacuees will be installed one by one seems to be appropriate for WRUA implementation. In this regard, this countermeasure is not difficult to implement as a pilot project.		

A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

Table 6.1-14 Structural Measures Evaluation Result as a Pilot Project (2)

Target Area		**Long term inundation area / Downstream of Lumi River**		
Countermeasure (Project)		**Raised of toilet**		
Outline		It is to rise up toilet to prevent water flow from come into the toilet and drain sewage.		
Image				
Merit		Preparation is short term. Easy to distribute, Collaboration with Ministry of Public health is effective.		
Demerit		Maintenance against deterioration		
Environmental Negative Impact		Nil		
Necessity of EIA		Unnecessary		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labour or materials.		
Main Actor		WRUA, individual		
Supporting Actor		**Administrative Authority:** County/District, Ministry of Health **Technical Authority:** MWI, WRMA		
Public assistance/ Mutual support /Self-help		Mutual support, Self help		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	It can be operated by WRUA and incorporated into the SCMP.	A	3
	Project Term	Few months are required for the implementation. There is a possibility to implement within term of PCDEM project, depending on the scale.	B	2
	Project Budget	It is possible to implement with WSTF fund or budget of PCDEFM project.	A	3
Relevance with PCDEFM Project・Total			8	
Comment		Overflowed sewage from toilet cause expansion of infectious disease. Raised up toilet prevents to overflow. People's demand is high. Example of Nyando Project was relatively expensive for WSTF. Standardization of design is expected and it will help expanding of raised toilet. Pilot project of raised toilet is expected to contribute standardization.		

A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

Table 6.1-15 Structural Measures Evaluation Result as a Pilot Project (3)

Target Area		**West side of downstream of Lumi River (Canal A/B/C)**		
Countermeasure (Project)		**Drainage Channel Improvement**		
Outline		It is to remove accumulated sedimentation. Flow capacity can be recovered.		
Image				
Merit		Expectable drastic effects		
Demerit		Each stage such as planning, design, and construction need long term. Total construction cost is more expensive than other countermeasures. Relevance with PCDEFM project is low. Continuous maintenance, High costs.		
Environmental Negative Impact		Silting at upstream and downstream Bio diversity		
Necessity of EIA		Necessary		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labour or materials.		
Main Actor		NWCPC, County		
Supporting Actor		**Administrative Authority:** County/ District **Technical Authority:** MWI, WRMA		
Public assistance/ Mutual support /Self-help		Public Assistance, Mutual support		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	Even if the scale of work is small, WRUA can implement the small-scale project through the SCMP and WSTF fund. However, such small scale drainage doesn't have suitable effect. Heavy construction machinery should be used for sufficient effect.	C	1
	Project Term	More than 1 year is required. It cannot be implemented within term of PCDEFM Project	C	1
	Project Budget	A large amount of budget is required. Neither SCMP (WSTF fund) nor PCDEFM project cover	C	1
Relevance with PCDEFM Project・Total			3	
Comment		Overall improvement of each of three drainage canals is necessary and large scale of construction work is also necessary. Therefore, implementation of this work by WRUA alone is impossible. Period and budget for this countermeasure is not covered by the Project. It is difficult to implement this countermeasure as a pilot project.		

A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

Table 6.1-16 Structural Measures Evaluation Result as a Pilot Project (4)

Target Area		**West side of downstream of Lumi River (Canal C)**		
Countermeasure (Project)		**Repair of existing embankment**		
Outline		It is repair work of existing embankment (canal C). Overflow stream from Lumi River can be minimized.		
Image				
Merit		Repair of broken part of Canal C is relatively simple and short term. Easy appearance of effects.		
Demerit		Securing stabilities, High costs		
Environmental Negative Impact		Nil		
Necessity of EIA		Unnecessary		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labour or materials.		
Main Actor		NWCPC, County		
Supporting Actor		**Administrative Authority:** County/District **Technical Authority:** MWI, WRMA		
Public assistance/ Mutual support /Self-help		Public Assistance, Mutual support		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	Even if the main actor is WRUA, they can implement the small-scale project through the SCMP and WSTF fund. However, such small scale drainage doesn't have suitable effect.	C	1
	Project Term	Few months are required for the implementation. There is a possibility to implement within term of PCDEM project, depending on the scale.	B	2
	Project Budget	A large amount of budget is required. Neither SCMP (WSTF fund) nor PCDEFM project cover	C	1
Relevance with PCDEFM Project・Total			4	
Comment		There is an embankment along Canal C in Lower Lumi river, but it was destroyed. However, exact stretch of breached embankment is not certain currently. If rehabilitation of long stretch of embankment is needed, cost of work might exceed the budget of the Project. Therefore, it is impossible to implement this countermeasure as a pilot project.		

A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

Table 6.1-17 Structural Measures Evaluation Result as a Pilot Project (5)

Target Area		**Long term inundation area / Downstream of Lumi River**		
Countermeasure (Project)		**Development of Community Road**		
Outline		It means to construct a culvert or rise up community road in order to prevent its incapability by flood.		
Image				
Merit		Short term to be effective		
Demerit		Continuous maintenance, Each process of planning, design and construction could take long time.		
Environmental Negative Impact		Nil		
Necessity of EIA		Unnecessary		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labor or materials.		
Main Actor		WRUA		
Supporting Actor		**Administrative Authority:** County/District, Ministry of Road, KeRRA **Technical Authority:** MWI, WRMA		
Public assistance/ Mutual support /Self-help		Public assistance, Mutual Support		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	Community road is inundated during flood. It disturbs evacuation, communication in the community and communing to school. Residents request highly, Raised up road is required. WRUA can implement the small-scale project through the SCMP and WSTF fund.	A	3
	Project Term	Design and construction can be few months. However, negotiation with road administration could take long time. It is difficult to implement within PCDEF project.	B	2
	Project Budget	Cost depends on the scale of construction. If the length of community road is not so long, it is possible to implement with WSTF fund or budget of PCDEFM project.	B	2
Relevance with PCDEFM Project･Total			7	
Comment		If the length of community road is not so long, it is possible to implement within the period and the budget of the Project. However, negotiation with road administration could take long time. In such case, it is impossible to implement within the Project.		

A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

Table 6.1-18 Structural Measures Evaluation Result as a Pilot Project (6)

Target Area		**Long term inundation area / Downstream of Lumi River**		
Countermeasure (Project)		**Spring protection (gabion)**		
Outline		It is to install gabion to protect springs for prevention of infiltration of flooded water.		
Image				
Merit		High effectiveness, Easy to start 'cause spring protection project is already implemented in Kuban Springs by UNDP and in Kitobo area by WSTF.		
Demerit		Maintenance against deterioration		
Environmental Negative Impact		Nil		
Necessity of EIA		Unnecessary		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labour or materials. (Collecting stones, Gabion assembling)		
Main Actor		WRUA		
Supporting Actor		**Administrative Authority:** County/District **Technical Authority:** MWI, WRMA		
Public assistance/ Mutual support /Self-help		Mutual Support		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	WRUA can implement the small-scale project through the SCMP and WSTF fund.	B	2
	Project Term	Few months are required for the implementation. There is a possibility to implement within term of PCDEM project, depending on the scale.	B	2
	Project Budget	It is not impossible to implement with WSTF fund or budget of PCDEFM project.	A	3
Relevance with PCDEFM Project・Total			7	
Comment		Scale of construction work for one spring protection is small. Limitation on the period and budget to implement in the Project is low. However, this countermeasure was implemented in the Lower Lumi Sub Catchment already. Therefore, it is not new for WRUA members and the community members, and applicability for the pilot project is not so high.		

A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

Table 6.1-19 Structural Measures Evaluation Result as a Pilot Project (7)

Target Area		**Long term inundated area / Downstream of Lumi River**		
Countermeasure (Project)		**Small check dam**		
Outline		Restrain silting and rising of riverbed		
Image				
Merit		Easy to distribute		
Demerit		Each process such as planning, design, and construction need long term. Large scale dredging is required for extensive effect. Dredging should be continued semi-permanently. Sustainability is low.		
Environmental Negative Impact		Bio diversity.		
Necessity of EIA		Necessary		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labour or materials.		
Main Actor		County, MWI, NWCPC		
Supporting Actor		**Administrative Authority:** County/District、MWI, WRMA **Technical Authority:** MWI, WRMA		
Public assistance/ Mutual support /Self-help		Public Assistance, Mutual support		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	The level of the technology of check dam is high. But, if the scale is small, check dam construction is not impossible for WRUA. However, sediment discharge from upstream is a cause and problem for lower Lumi area. Therefore, coordination between upper and lower sub catchment and it is difficult for one WRUA alone to implement it.	C	1
	Project Term	Sediment discharge control by one check dam is limited. Therefore, effective allocation of plural check dams is necessary. Necessary study, design and construction for appropriate allocation need time.	C	1
	Project Budget	If plural check dams are constructed, the cost becomes high. On the other hand, if single check dam is constructed one by one, cost for one check dam is not high and is able to be covered by WSTF.	B	2
Relevance with PCDEFM Project･Total			4	
Comment		This countermeasure needs coordination within large area such as upstream and downstream. And project area and benefit area is not the same. Therefore, this countermeasure is seemed to be conducted by public institutions.		

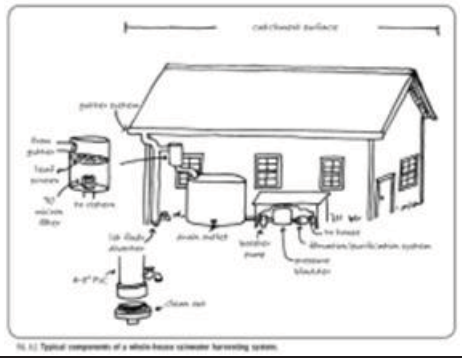
A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

Table 6.1-20 Structural Measures Evaluation Result as a Pilot Project (8)

Target Area		**Tributary Stream Area / Downstream of Lumi River**		
Countermeasure (Project)		**Bank Protection**		
Outline		It is a structure to prevent riverbank erosion.		
Image				
Merit		Short term to be effective, Easy to repair		
Demerit		Determinate term will be required to implement in each process such as "Planning", "design" and "construction" Improvement of existing construction method will be required. General construction of bank protection is not suitable to characteristics of Lumi river. , Continuous maintenance, Easy to breach (Bank protection that is constructed by KeRRA is already broken.)		
Environmental Negative Impact		Depending on scale.		
Necessity of EIA		Depending on scale.		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labour or materials. (Collecting stones, Gabion assembling)		
Main Actor		WRUA		
Supporting Actor		**Administrative Authority:** County/District、MWI, WRMA **Technical Authority:** MWI, WRMA		
Public assistance/ Mutual support /Self-help		Public Assistance Mutual support		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	WRUA can implement the small-scale project through the SCMP and WSTF fund.	B	2
	Project Term	Few months are required for the implementation. There is a possibility to implement within term of PCDEM project, depending on the scale. Study on appropriate installation location takes time.	C	1
	Project Budget	Budget scale is medium. It is not impossible to implement with WSTF fund or budget of PCDEFM project.	A	3
Relevance with PCDEFM Project･Total			6	
Comment		Effect of one riverbank protection can be seen in limited area. However, erosion of gully is very common in this sub catchment. WRUA members understand the necessity of bank erosion control.		

A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

Table 6.1-21 Structural Measures Evaluation Result as a Pilot Project (9)

Target Area		**Long term inundation area / Downstream of Lumi River**		
Countermeasure (Project)		**Rain water harvesting**		
Outline		Distributing the rain water storing by using roof, gutters and tank		
Image				
Merit		Easy to distribute, Raising ownerships Effectiveness in the irrigation		
Demerit		Maintenance and replacement against deterioration		
Environmental Negative Impact		Nil		
Necessity of EIA		Unnecessary		
Contribution by the residents		According to WDC Manual, Residents should provide contribution. In Alarm Status sub catchment, it should be 15%. On the other hand, in Alert or Concern Status sub catchment, it should be 25%. The contribution will be provided by cash, labor or materials.		
Main Actor		Town Council/WRUA		
Supporting Actor		**Administrative Authority:** Town Council **Technical Authority:** MWI, WRMA		
Public assistance/ Mutual support /Self-help		Mutual Support, elf-help		
Relevance with PCDEFM Project	**Possibility to operate the project by WRUA**	If tank equipped house are increased, it will be effective. Numerous number of tanks will be required to expect the effect for flow restraint.	C	1
	Project Term	Installation needs a short time only. However, getting consensus from institutions and houses need enough coordination and time.	B	2
	Project Budget	Depend on the scale	B	2
Relevance with PCDEFM Project･Total			5	
Comment		It is effective to ensure the domestic water use, but, effect for flood mitigation is very limited.		

A (3 point): Excellent / B (2 point): Good / C (1 point): Poor

6.1.10 Selection of Type of Pilot Project

WRMA and the JICA Project Team evaluated the nine (9) possible candidates for structural measures explained in the previous section and the result was summarized as shown in the table 6.1-12 below.

Table 6.1-22 Evaluation Result of Candidate Structural Measures as Pilot Project

No.	Candidate Structural Measure	Score
1	Environmental Improvement of Evacuation Camp	8
2	Raised-up Toilet	8
3	Spring protection (Gabion)	7
4	Development of Community Road	7
5	Bank Protection	6
6	Rain water harvesting	5
7	Repair of existing embankment	4
8	Small check dam	4
9	Drainage Channel Improvement	3

It is herein noted that, there was an opinion that selection of pilot project should be done by stakeholders. In this regard, the final determination of pilot project was through the discussions held in the IFMC and public consultation meeting with community members that reside near the site. Thereafter, the four countermeasures were evaluated from the three evaluation axes and wherein the prioritization was undertaken.

Table 6.1-23 Result of the primary screening was as follows and five measures were remained.

Proposed measures	**Estimated cost (Mil. Ksh.)**	**Preparation & Construction period**	**Effectiveness**
Environmental improvement of evacuation camp	5-10	2-6 Mons	OK
Raised up toilet	2-5	2-6 Mons	OK
Repair of existing embankment	More than 10	2-5 yrs.	NO
Development of Community Road	5-10	2- 6 Mons	OK
Spring protection (Gabion)	2-5	2-3 Mons	OK
Channel improvement of Lumi River	More than 100	10 yrs.	NO
Building small check dam	More than 10	2 – 5 yrs.	NO
Bank protection	5-10	2-6 Mons	OK
Rain water harvesting	More than 100	2 - 5 yrs.	NO

Thereafter, in the IFMC meeting, the remaining five countermeasures were evaluated by the participants. The evaluation criteria were “Feasibility by WRUA” and the details are as follows:

- Can WRUA be a main actor of the project?

- Can it be implemented by community level?

The result of the evaluation is shown below. The criteria of feasibility for all alternatives are the same A. Most of participants prioritized "Environmental improvement of evacuation camp" as the first and "Raised toilet" as the second. However, some small number of participants prioritized "Development of Community Road" as the first and "spring protection" as the second.

Table 6.1-24 Final evaluation of proposed structural measures as a pilot project

Proposed measures	Feasibility	Priority
Environmental improvement of evacuation camp	A	1
Raised toilet	A	2
Development of Community Road	A	4 (2)
Spring protection (Gabion)	A	3 (1)
Bank protection	A	5

6.1.11 Selection of Pilot Project and Site

In Lower Lumi Sub Catchment there was no equipped evacuation place. The slightly raised grounds that do not get inundated during floods were being used as evacuation places and there were no toilets or other sanitation facilities for evacuees. Therefore, with regard to selection of pilot project, environmental improvement of evacuation camp was the highest priority and raised toilets as the second highest priority and they were combined together in consideration of the budget and construction period, and were proposed as a pilot project by WRMA and the Project Team. Thereafter, it was agreed through consensus building among the participants of IFMC to be the pilot project.

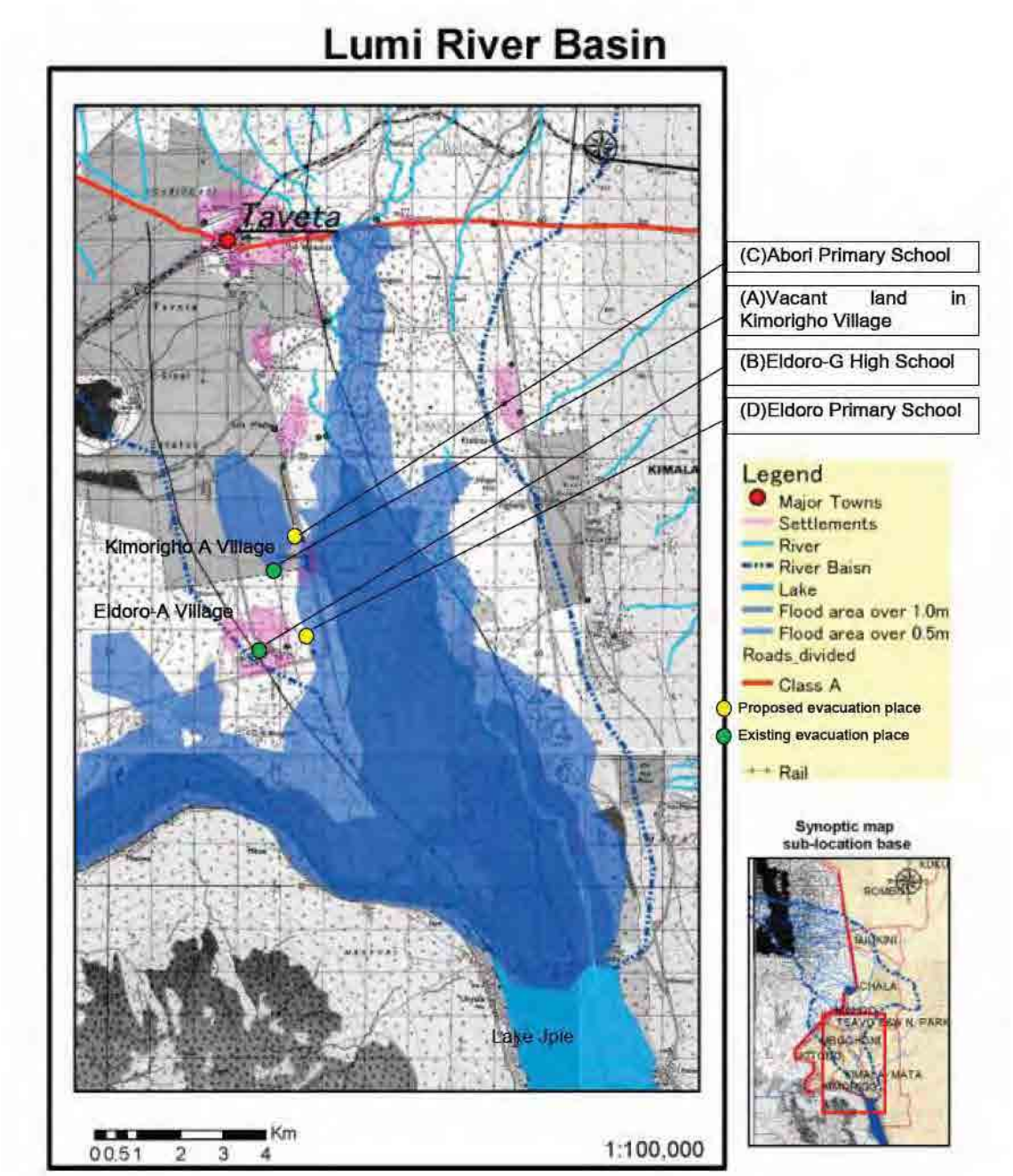


Fig. 6.1-7 Current Situation of Evacuation Camp in Lower Lumi Sub Catchment

Three alternative places for improvement of evacuation place were compared and eventually one was selected as the pilot project of this project. D: Eldoro Primary School was evaluated and came out as the highest in terms of number of beneficiary, safety and sanitation, accessibility by the evacuees during evacuation, and easy participation of community people, and had no problem in environmental and social consideration, was determined to be improved as an evacuation place.

Table 6.1-25 Evaluation of Evacuation Place Improvement

Evaluation Criteria		B: Field of Eldoro Girls High School	C: Abori Primary School	D: Eldoro Primary School
Improvement considered		- Securing evacuation space, - Installing storage for relief supplies, - Procurement & maintenance of relief supplies	- Raising access roads, - Securing evacuation space, - Raising toilets	- Raising access roads, - Securing evacuation space, - Raising toilets, - Culvert for drainage
1) Effects of flood measures	Number of beneficiary	Beneficiaries limited, as a large evacuation building cannot be built. **Moderate**	Beneficiaries limited, as a large evacuation building cannot be built. Number of beneficiaries will become large if classrooms which can be used for evacuation hall will be developed in the future. **Good**	Beneficiaries limited, as a large evacuation building cannot be built. Number of beneficiaries will become large if classrooms which can be used for evacuation hall will be developed in the future. **Good**
	Safety & Health	Evacuees have to stay in tents. Toilets and water should be borrowed from neighboring people of the school. Safety and health is not well. **Bad**	Evacuees will be able to stay inside of building and use water supply and toilets in school compound. **Good**	Evacuees will be able to stay inside of building and use water supply and toilets in school compound. **Good**
	Accessibility to evacuation place	4 km from Kimorigho A Village Farthest from inundated village. Safest as the ground not to be inundated. **Good**	Very close to Kimorigho A Village, Inundation depth is about 0.6 m. Far from raised main road. Nearest to inundated village but poor access **Moderate**	3 km from Kimorigho A Village, Inundation depth for normal flood year is 0.3 m. It is not quite near to the inundated target village but connected to main raised road. **Good**
2) WDC cycle	Ease of residents participation	Private school interest may not be in line with that of evacuees. **Moderate**	Good community participation expected with primary school **Good**	Good community participation expected with primary school. **Good**
3) Environmental Impact	Natural environmental influence	Nothing **Good**	Nothing **Good**	Nothing **Good**
	Social environmental influence	Nothing **Good**	Nothing **Good**	Nothing **Good**
Overall evaluation		The possibility of inundation is very low, so it has very high possibility as an evacuation place. But, there is limitation as a private school, and development of facilities is not suitable for this land.	This is the nearest place from the village where a lot of evacuees exist. However, the land of this school will be inundated and it is far from raised main road. Therefore, evacuees might be isolated. This place is not suitable for evacuation place.	Evaluation result for every criterion is almost same to Abori Primary School. But, the inundation depth is shallower than Abori Primary School. Therefore, construction volume will be smaller than Abori and the safety will be higher than Abori.
Result of Selection		Not selected	Not selected	**Selected**

6.2 Preparation of Implementation Plan of Community Based Activities

The structural measure for community based activities was agreed upon as improvement of evacuation place including evacuation hall, raised access road, raised toilets and installation of drainage culvert in Eldoro Primary School.

Design drawings are shown below. And the total estimated cost was Kshs. ,700,000 as per the unit cost of WSTF.

Detailed explanations of these activities are shown in Appendix 3-20.

Rough time schedule of the pilot project is shown in the table 6.2-2.

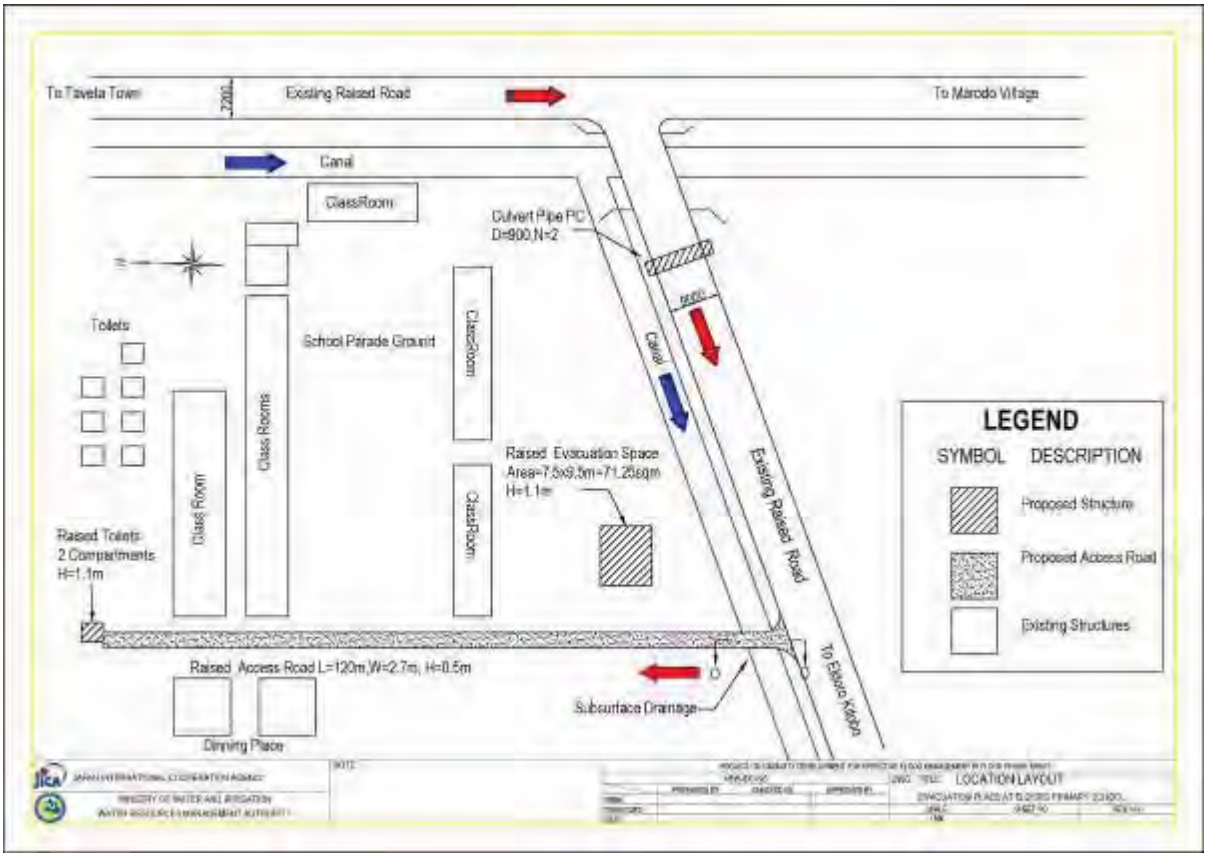


Fig. 6.2-1 Location Layout

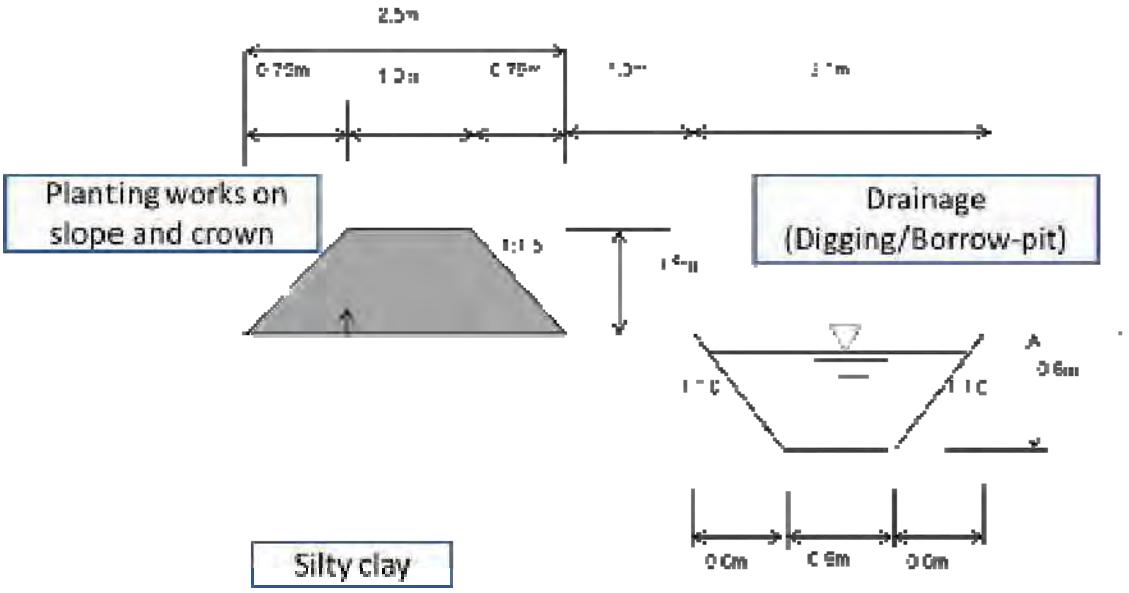


Fig. 6.2-2 Standard Cross Section of Raised Access Road

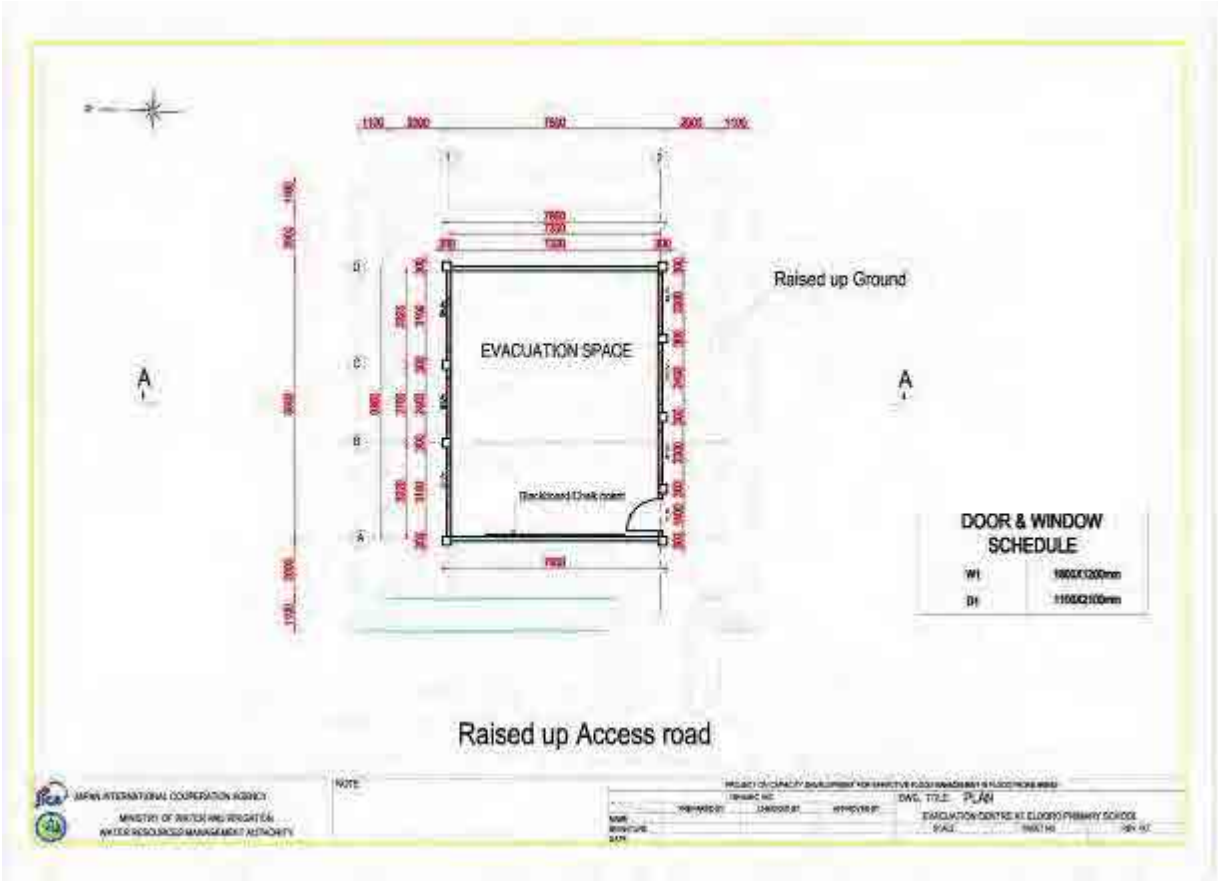


Fig. 6.2-3 Plan of Evacuation Hall

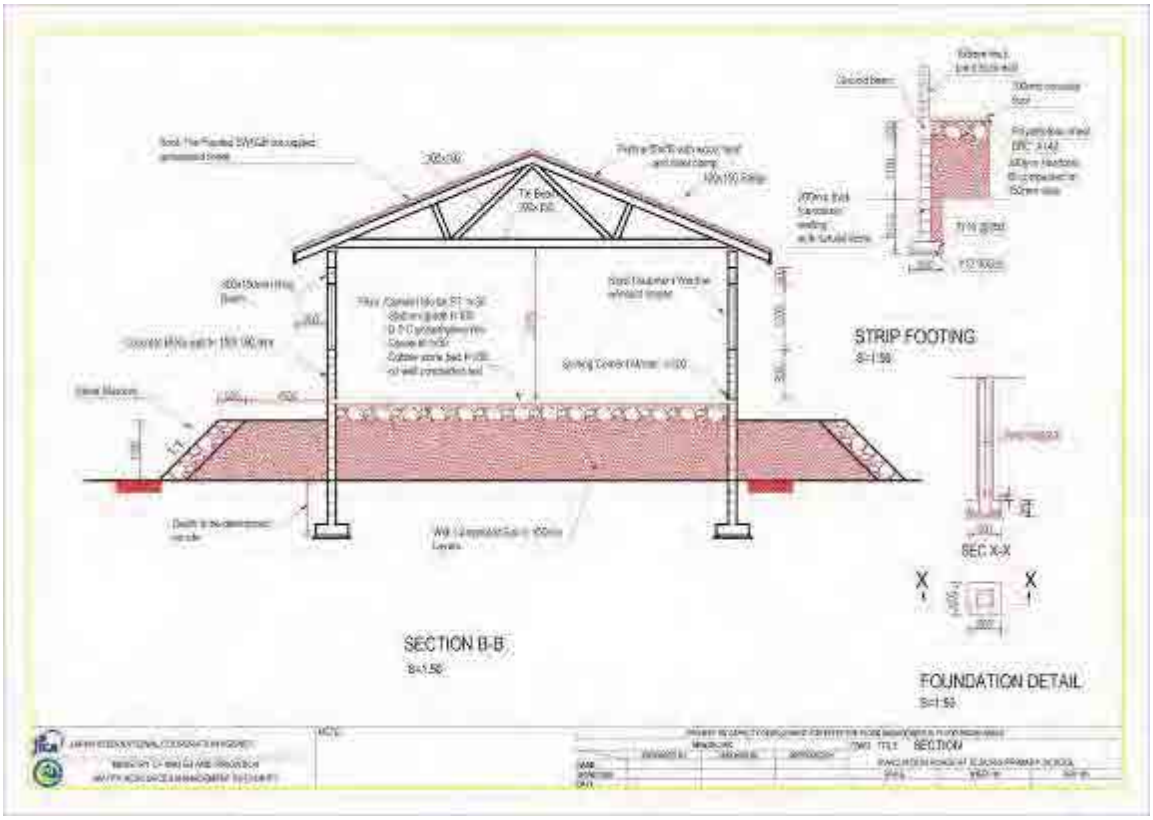


Fig. 6.2-4 Section of Evacuation Hall

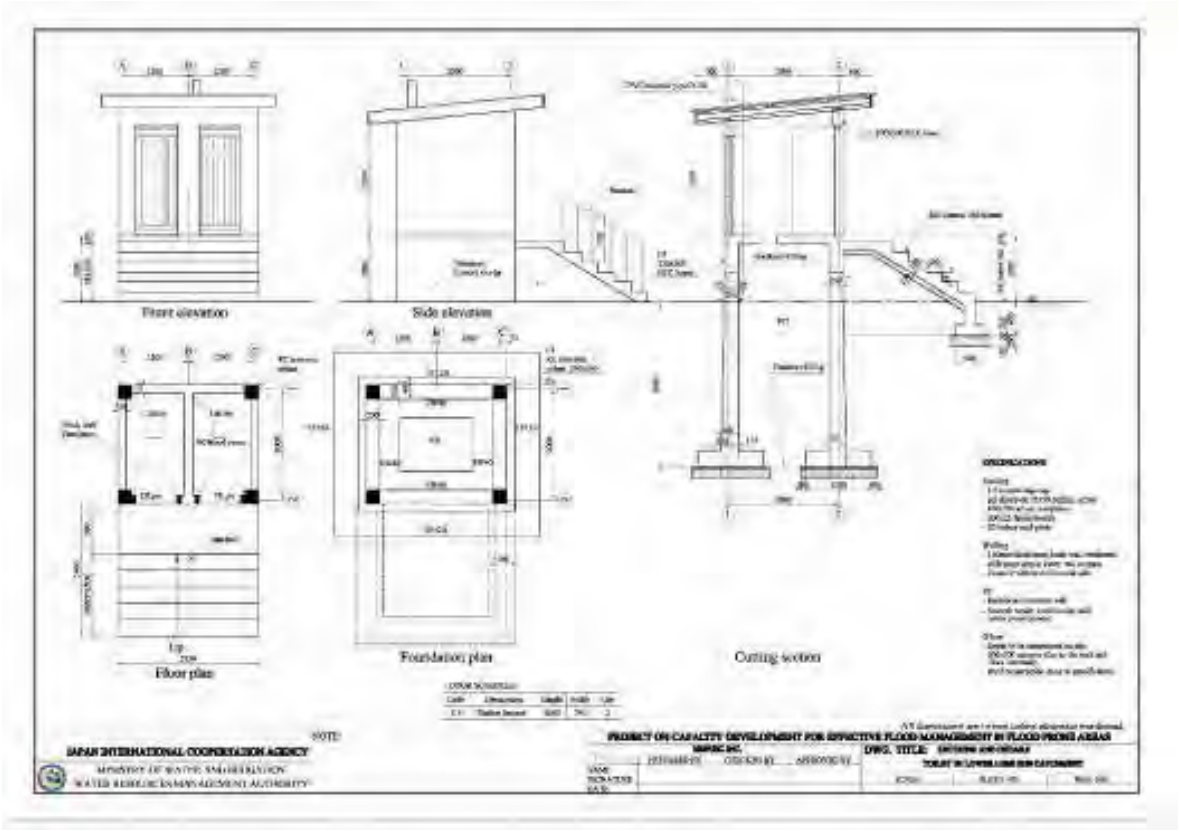


Fig. 6.2-5 Raised Toilets

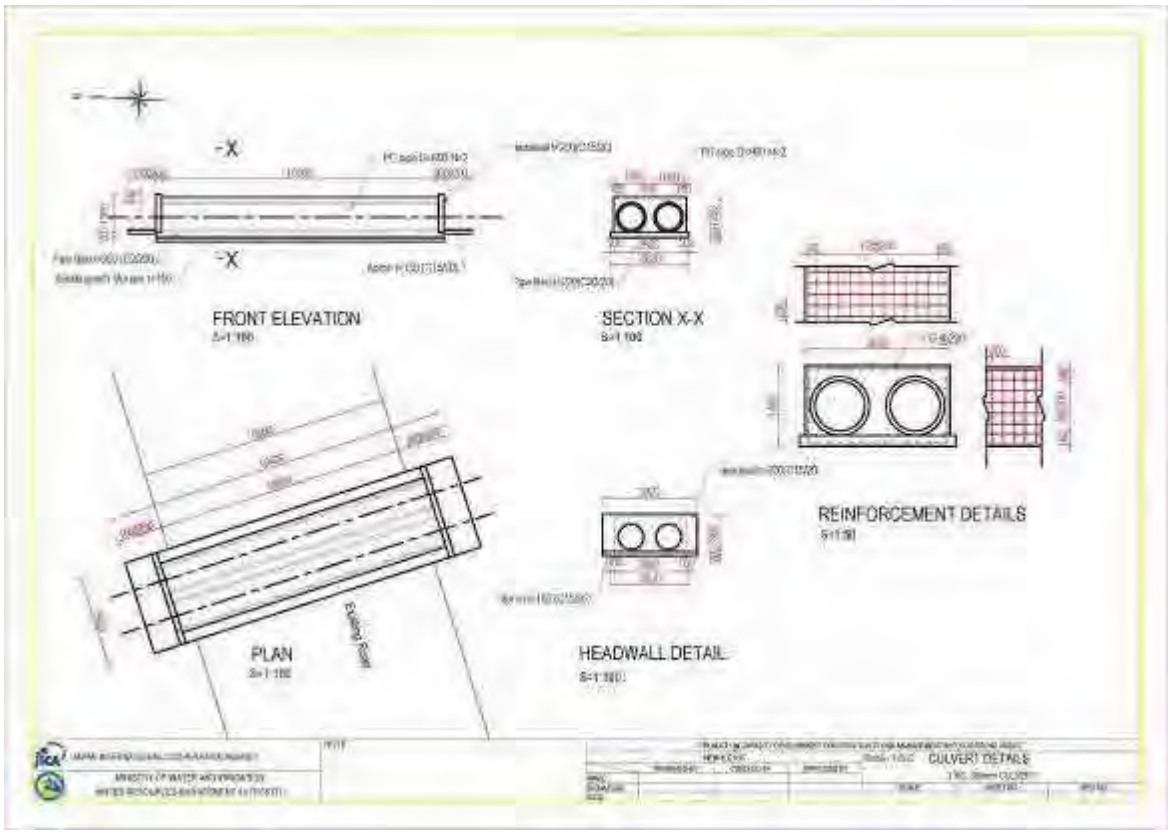


Fig. 6.2-6 Drainage Culvert under Road

Table 6.2-1 Bill of Quantities (Raised Access Road)

Construction Item		Work Item	Description	Unit	Quantity	Unit Rate (Kshs)	Amount (Kshs)
	Raising up access road						
Earthworks							
	1	Common Excavation	h < 1.5 m	Cu.m	105.00	819.00	85,995
	2	Embankment	Sandy material	Cu.m	105.00	850.00	89,250
	3	Well compacted clay core		Cu.m	105.00	143.00	15,015
						Total Amount	190,260

Table 6.2-2 Bill of Quantities (Evacuation Hall)

Construction Item		Work Item	Description	Unit	Quantity	Unit Rate (Kshs)	Amount (Kshs)
	Shelter						
		Earthworks					
	1	Common Excavation A	h < 1.5 m	Cu.m	30.00	819	24,570
	2	Back filling type	Sandy material	Cu.m	14.25	1,250	17,813
	3	Embankment	Sandy material	Cu.m	72.85	850	61,923
	4	Back filling type	Hardcore filling, Rubble stone bed	Cu.m	14.25	1,500	21,375
		Concrete works					
	5	Concrete Class 20/20 (1:2:4)		Cu.m	20.00	16,379	327,580
	6	Concrete Class Q (1:3:6)	Leveling Concrete	Cu.m	1.50	12,500	18,750
	7	Formwork	H < 3.5 m	Sq.m	302.00	733	221,366
	8	Reinforcing bar	Material and Installation	Kg	2,850.00	108	307,800
		Architectural works					
	9	Concrete Blocks	Blocks t= 190/150 mm with re-bar	Sq.m	110.00	2,269	249,590
	10	Plastering	Floor t=30mm	Sq.m	71.25	707	50,374
	11	Plastering	Skirting h=100mm	Sq.m	2.00	725	1,450
	12	Plastering	Interior t=20mm	Sq.m	69.00	421	29,049
	13	Plastering	Keying	Sq.m	15.00	2,400	36,000
	14	Plastering	Wainscot t=30mm h=600 mm	Sq.m	6.30	707	4,454
	15	Plastering	Lintel t=30mm	Sq.m	10.50	775	8,138
	15	Door	Wooden Door	Nos	1.00	2,500	2,500
	16	Window	steel Casement	Nos	6.00	9,500	57,000
	17	Window Glasses	t = 5 mm	Nos	108.00	1,200	129,600
	18	Painting	Oil paint for steel structure	Sq.m	2.60	362	941
		Painting	Oil paint for wooden structure	Sq.m	14.82	322	4,772
	19	Painting	Emulsion paint for interior	Sq.m	69.00	323	22,287
	20	Wooden Structual	Wooden Truss	Cu.m	27.00	25,050	676,350
	21	Roof gutter	Pre-painted sheet 150x100x180	Lin.m	20.00	1,000	20,000
	22	Roofing	Pre-painted corrugated galvanized sheet	Sq.m	168.00	1,950	327,600
	23	Down Spout	PVC pipe	Lin.m	10.00	800	8,000
		Total construction cost					**2,629,281**

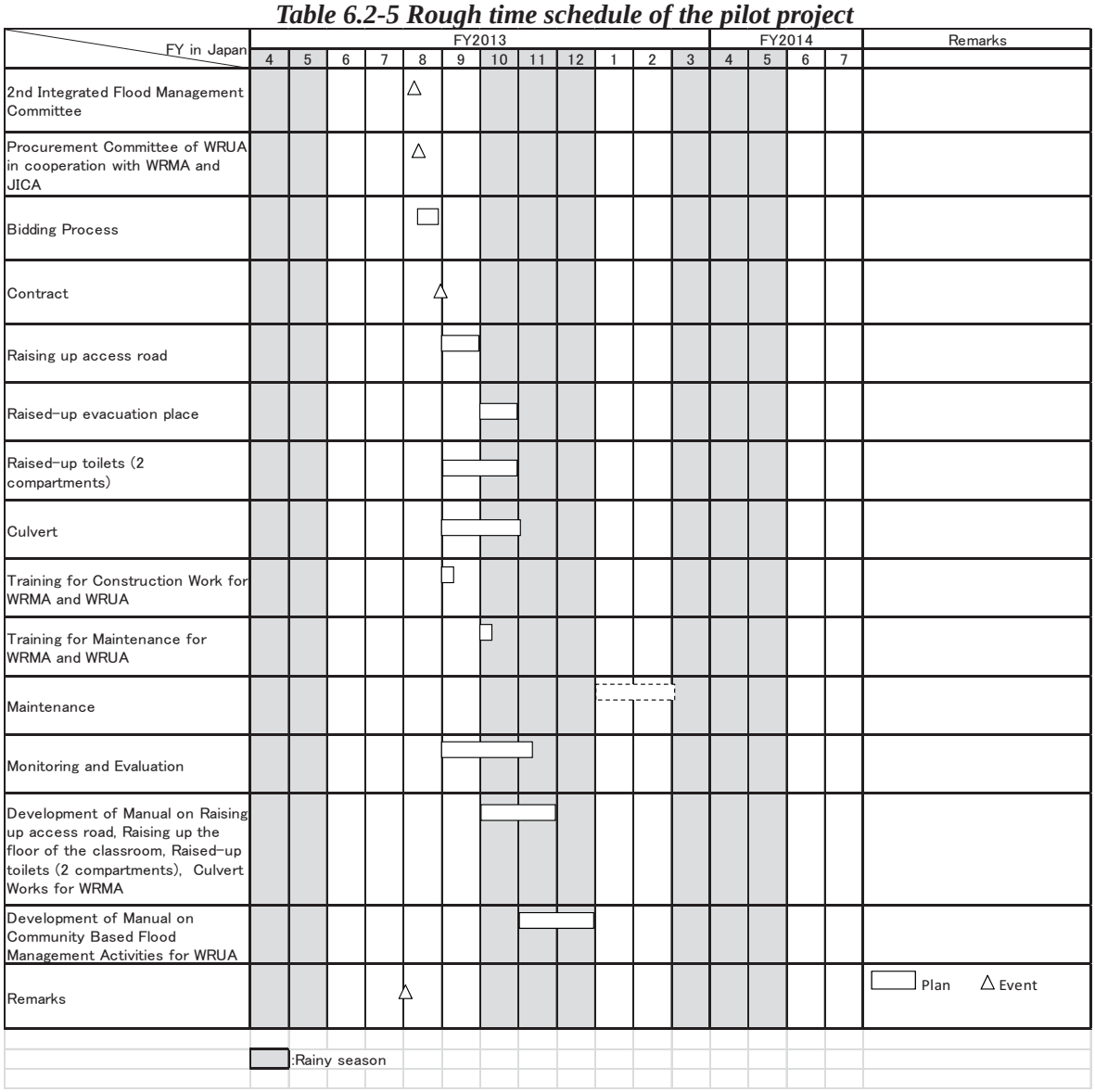
Table 6.2-3 Bill of Quantities (Raised Toilets)

Construction Item	Work Item		Description	Unit	Quantity	Unit Rate (Kshs)	Amount (Kshs)
	Toilets (2 Compatments)						
Earthworks							
	1	Common Excavation	h < 1.5 m	Cu.m	356.00	819.00	291,564
	2	Back filling	Sandy material	Cu.m	305.00	1,250.00	381,250
	3	Embankment	Sandy material	Cu.m	2.00	850.00	1,700
	4	Waste Material	Dumpling and leveling	Cu.m	49.00	950.00	46,550
	5	Back filling	Hardcore filling, Rubble stone bed	Cu.m	5.00	1,500.00	7,500
Concrete works							
	1	Concrete Class 20/20 (1:2:4)		Cu.m	28.00	16,379.00	458,612
	2	Formwork	H < 3.5 m	Sq.m	127.00	733.00	93,091
	3	Reinforcing bar	Material and Installation	Kg	2,420.00	108.00	261,360
Architectural works							
	1	Brick	Bricks t = 150 mm with er-ber	Sq.m	13.00	2,307.00	29,991
	2	Ceramic tiles floor works	(150 x 150 x 6) mm	Sq.m	4.00	66.00	264
	3	Ceramic tiles wall works	(150 x 200 x 6) mm	Sq.m	19.00	84.00	1,596
	4	Plastering	Floor t=30mm	Sq.m	12.00	707.00	8,484
	5	Plastering	Interior t=20mm	Sq.m	2.00	421.00	842
	6	Plastering	Exterior t=25mm	Sq.m	17.00	589.00	10,013
	7	Plastering	Wainscot t=30mm h=1,300	Sq.m	8.00	707.00	5,656
	8	Door	Wooden made	Sq.m	2.00	1,250.00	2,500
	9	Painting	Oil paint for wooden structure	Sq.m	11.00	322.00	3,542
	10	Painting	Oil paint for steel structure	Sq.m	2.00	362.00	724
	11	Painting	Emulsion paint for interior	Sq.m	2.00	323.00	646
	12	Painting	Vinyl Emulsion for Ceiling	Sq.m	10.00	327.00	3,270
	13	Wooden Structual	Wooden Truss	Sq.m	1.00	5,050.00	5,050
	14	Ceiling installation	ceiling board t=10mm	Sq.m	10.00	975.00	9,750
	15	Ceiling installation	connices	Lin.m	8.00	120.00	960
	16	Steel hand rail		Lin.m	3.00	2,500.00	7,500
	17	Roofing	Pre-painted corrugated galvanized sheet	Sq.m	11.00	1,200.00	13,200
	18	Ceiling inspection chamber	600x600	Nos	2.00	1,200.00	2,400
						Total Amount for Toilet (2) works	1,648,015

Table 6.2-4 Bill of Quantities (Drainage Culvert)

Construction Item	Work Item		Description	Unit	Quantity	Unit Rate (Kshs)	Amount (Kshs)
	Culvert						
Earthworks							
	1	Common Excavation	h < 1.5 m	Cu.m	30.00	819.00	24,570
	2	Back filling	Sandy material	Cu.m	12.20	1,250.00	15,250
	3	Waste Material	Dumpling and leveling	Cu.m	17.80	950.00	16,910
	4	Murram	50mm murram	Cu.m	5.00	292.00	1,460
	5	RC pipe culvert	D=900mm, L=1.0m	No	20.00	9,000.00	180,000
						Total Amount	238,190

Table 6.2-5 Rough time schedule of the pilot project



6.3 Respective Roles for the Organizations tasked for Implementing Pilot Projects

Many organizations will be involved in construction of structural measures executed as community flood management activities. WRUA is a main organization and WRMA is work closely with WRUA.

Following guidelines for implementation are extracted from WDC:

- WRUA to propose to WRMA by means of the process of SCMP formation
- WRMA to judge technically suitable countermeasures
- WRMA to advise appropriately to the organizations concerned
- WRUA to implement the project by obtaining the WSTF fund

WRUA is responsible for cooperation, adjustment and co-working with Community Based Organization (CBO), the land owners and community members. WRUA is also required to provide work force or monetary contribution or by any other means.

WRMA-SRO is required to provide WRUA with technical advice and support for WRUA to implement the project.

When WRUA makes contracts with the contractors for the project, WRMA-SRO is responsible for giving instructions to WRUA concerning procurement procedures and contractor's technical supervision and instruction.

The national and regional administration organizations may be involved in WRUA and WRMA works, especially when the construction of infrastructures concerns the lives of the population.

There will be other relevant organizations for the specific work category and project implementation location, such as Ministry of Education, the principal and PTA in case schools are involved in sensitization of and cooperation to the project.

As for the raising work of toilet facilities, cooperation with Ministry of Health is necessary, and cooperation with KeRRA is necessary for provision of culvert constructed on the road.

Such cooperation is to be provided at regional offices of relevant authorities, and at central offices in case such cooperation be not approved by the regional offices.

As for the requirement for assessment of environmental impacts and the procedures therein would be determined based on the project contents and magnitude. As mentioned above, WRMA and WRUA have respective roles and responsibilities under WDC scheme. In the execution of pilot projects of this Project, WRUAs and WRMA were given roles and responsibilities as per WDC guidelines and this provided an occasion for learning by doing for both WRUAs and WRMA.

Following figure 6.3-1 shows ideal role, responsibility and cooperation among the relevant organizations so that WRMA and WRUA can proceed with the project.

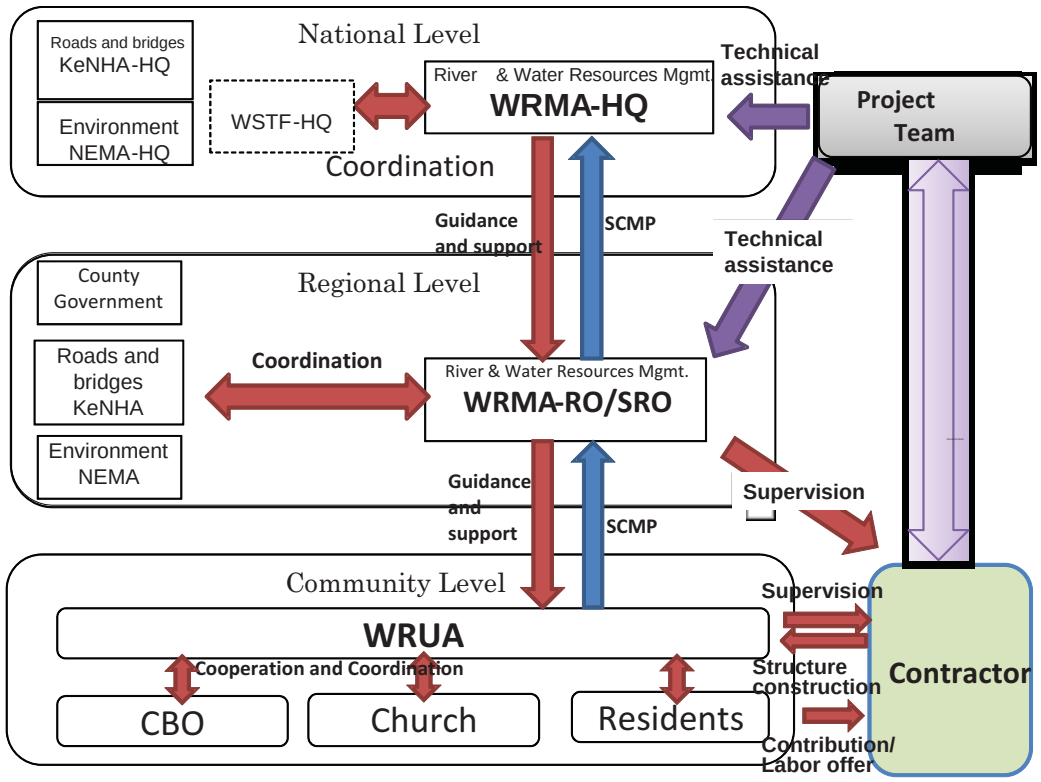
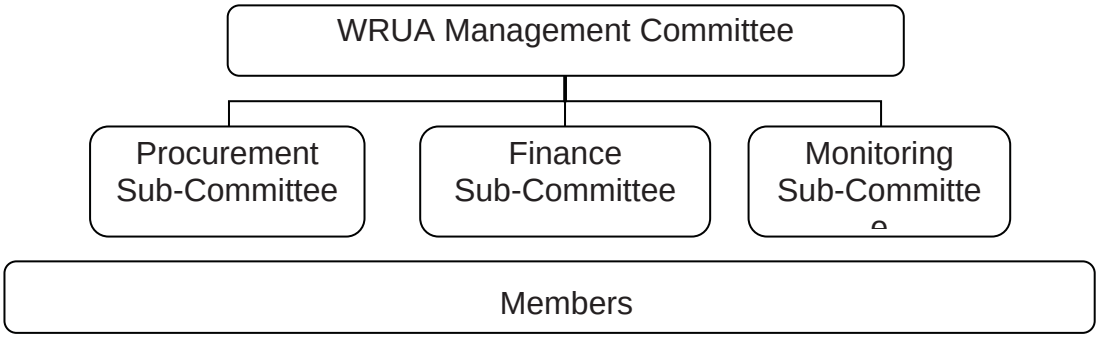


Fig. 6.3-1 Implementation Organization of the Pilot Project

6.3.1 Internal Organization and Role of WRUA according to WDC

WDC specifies to establish management organizations in WRUA such as Management Committee, Procurement Sub-Committee, Finance Sub-Committee and Monitoring Sub-Committee as follows.



Source: Prepared by Project Team based on WDC Toolkit

Fig. 6.3-2 Management Organization of WRUA

Table 6.3-1 Roles of WRUA Management Organization

Committee	Role
Management Committee	Overall management and construction management to superintend the fund usage and resultant efficiency.
Procurement Sub-Committee	Selection of products and services providers with inquiry and receipt of those estimations of products and services. Check and storage of the procured goods.
Finance Sub-Committee	Responsible for all financial process and independent account reporting. Publicize of the fund usage information.
Monitoring Sub-Committee	Monitoring of the fund usage, quality and amount value of the activities and products. Check of product quality and its delivery. Independent monitoring report at the committee and confirmation of the product provided by other sub-committees.

Source: Prepared by Project Team based on WDC Toolkit

6.3.2 Role Allocation of WRUA and WRMA according to WDC

WDC stipulates cooperation during the works including role allocation of WRUA and WRMA on the planning, feasibility study, design, legal approval, procurement, construction and operation. Thus, the pilot projects were implemented by the Project Team and WRMA from planning to execution. WRUA's committees were given similar roles as stipulated in the WDC guidelines concerning projects, and ensuring committees' respective functions.

The Project Team based on WDC guidelines determined the roles of WRMA and WRUA to enhance their understanding, and also provide them with necessary support. Also the Project Team incorporated the findings on the supporting process into the supporting manual for WRMA and activity manual for WRUA.

Table 6.3-2 Allocated Roles of WRUA and WRMA for Implementation of Structure Construction

Work Stage	Work Item	Role of WRUA and WRMA
Legal approval	Land usage, etc.	・WRUA is mainly responsible for negotiation with the land owner. ・WRMA is mainly responsible for negotiation with administration office.
Procurement	Pre-qualification of bidders	・WRMA-SRO to obtain long-list of the suppliers prepared by MWI ・WRMA jointly with WRUA Procurement Committee to examine necessary requirements to prepare pre-qualification document ・Approval of Pre-Qualification Document by WRUA Management Committee
	Bidding	・WRMA-SRO jointly with WRUA Procurement Committee to prepare bid document (specifications, drawings, bill of quantity, etc.) ・WRUA Procurement Committee to notify the pre-qualified bidders to request for bid proposal submission
	Evaluation of bid proposals	・WRUA Procurement Committee to prepare bid opening and evaluation ・WRUA Procurement Committee to open the bid proposals, and evaluate jointly with WRMA-SRO ・WRUA Procurement Committee to prepare the evaluation process and submit for selection of the successful bidder by Management Committee
	Negotiation and contract with successful bidder	・WRUA Procurement Committee to prepare contract document ・WRUA Management Committee to execute the contract
Construction	Supervision	・WRUA Monitoring Committee to supervise the contractor's works
	Inspection	・WRUA Monitoring Committee to inspect the contractor's works to approve them
	Completion Inspection and Payment	・WRUA Finance Committee to execute completion inspection and to pay the contract price
Operation	Operation and Maintenance	・WRUA Monitoring Committee is responsible.

Source: Prepared by Project Team based on WDC Manual

6.4 Project Team's Support to WRUA and WRMA

6.4.1 Current Capacity for Project Implementation of WRMA and WRUA

The Project Team discussed with WRMA about the above-mentioned allocated roles to assess WRUA's capacity for implementing the pilot project. The following issues concerning WRUA's capacity are recognized in terms of WDC's approach through SCMP.

Table 6.4-1 SCMP's Respective Applications for WDC Frame Works

	LOGUMI WRUA	Isiolo WRUA	Lower Lumi WRUA
Current Situation (Not revised for all 3 sites)	Revision issued in May 2012 for 5-year plan, approved by WRMA head quarter	1st edition issued in March 2009 for 3-year plan	1st edition issued in December 2009 for 3-year plan
Description of flooding	Described	Described	Described
Revision	Scheduled in 2017	Having scheduled in 2012	Having scheduled in 2012
	Revision time is specified by SCMP, which is the basis for revision, provided in case the revision time should have passed but under the WRUA's application of WDC fund, the revision by SCMP should not be allowed unless the approval of the application, fund disbursement and all the projects' application process Have been finished.		
WDC level	2nd step	3rd step	2nd step
Application Situation to WDC	1st step : finished Applied on JAN/13/2010 Approved on APR/21/ 2010 Completed on OCT/21/ 2010 2nd step : under Application Applied on JUN/4/2012 Passed examination of WRMA and submitted to WSTF on NOV/6/ 2012	1st step : finished 2nd step : finished 3rd step : Applied (K.S. 4,994,600) for 3 installments of disbursement, and the 1st disbursement finished for forestation at K.S. 771,000.	1st step : finished 2nd step : Applied and under project implementation for dredging of water channel and preservation of the fountain of water supply source
Expected approval of Project under application to WDC	Normally 6 months to 1 year to pass the examination	By NOV/2013 at earliest	Unknown
Inclusion of Flood Protection in the project under WDC application t	Not included	Not included	Included (dredging of water channel)

LOGUMI WRUA and Isiolo WRUA are at the second step (possible to apply WSTF fund of Ksh 2,000,000/-), and Lower Lumi WRUA is at the third step (possible to apply WSTF fund of Ksh 5,000,000/-). Although water channel dredging is under construction for Lower Lumi WRUA, it was revealed that it did not require much of structural designing. Further, it was revealed that there was no WRUA that had experience in contracting procedures.

Therefore, it was anticipated that it would be difficult for WRUA to implement any pilot project on its own by means of the procurement procedures up to the awarding of contract.

In consideration of the said situation, the Project Team discussed with WRMA and judged that WRUA should gain experience on procurement, for which following arrangements were

targeted for implementation:

- Establishment of procurement committee consisting of the members of WRUA, WRMA and the Project Team.
- Execution of procurement of the contractor and other necessary facilities by supporting the Sub-Procurement Committee of WRUA.

Through the above-mentioned arrangements, it aimed at capacity-building of the persons of WRMA and WRUA for procurement of the contractor, construction supervision and inspections among other activities.

Detailed explanations of these activities are shown in Appendix 3-21.

6.4.2 Assistance in Preparation of Bidding Document

The Project Team judged it would be necessary for the Team to prepare the draft bid document for the purpose of above-mentioned works, and present it to the procurement committee.

For preparation by the Project Team, the Project Team examined whether the past bid and contract documents were available, however, it was found that almost all such documents for procurement were at the second step of WDC, and appropriate sample documents were not available. On the other hand, sample contract documents for training service supplied by WSTF were so simple and could not be used for purposes of construction works.

Based on the above mentioned situation, the Project Team therefore used a WRMA's bid documents for construction work and simplified them to be as practicable as possible so that the document could be used by the then inexperienced personnel of WRUA.

The sample bid document of WRMA that was used was the "Procurement of works for the construction of Mombasa sub-region offices block".

WRMA also provided the Project Team with another sample document "Standard Tendering Document, Procurement of Works, Small Works (Public Procurement Oversight Authority)". The "Standard Tendering Document" had been prepared for small scale project, but applicable to the project budget of up to Kenya shillings two hundred million (Kshs. 200,000,000), which was much larger than the pilot project of Kenya shilling five million (Kshs. 5,000,000). The contents of the document were similar to that of WRMA bid document, and therefore, the Project Team started process of simplification of the document based on the WRMA bid document in order to make it applicable to small scale projects.

The description of the bid document including the contents, and how the the contract document is to be prepared by modifying is shown in the table 6.4-2 below.

Table 6.4-2 Contents of Bid Document and Contract Document used by WRMA

	Bidding documents		Contract documents
			Agreement Letter of Acceptance Contractor's Bid
Section I	Instructions to Bidders		General Conditions of Contract
Section II	General Conditions of Contract		Special Conditions of Contract
Section III	Special Conditions of Contract		Specifications and Performance Requirements
Section IV	Bidding Data Sheet, Forms of Bid, Qualification Information, Letter of Acceptance, Agreement		Drawings
Section V	Drawings		Bill of Quantities
Section VI	Bill of Quantities		
Section VII	Specifications and Performance Requirements		

As for the Technical Specifications for the pilot project, the Project Team utilized the contents of the above bid document as well as the similar specifications which the Project Team possesses and also the related items that were used in the Nyando Project.

Further, since the pilot project was not an abstract idea but a practical idea that was going to be implemented in reality and therefore a contract between the Project Team and a local contractor was prepared, the Project Team also confirmed that the bid document met the requirements of contract guidelines of JICA.

6.4.3 Holding of Procurement Committee Meeting

Procurement Committee Meeting was held on September 20, 2013 in Nairobi for the purpose of supporting WRUA Procurement Sub-committee by WRMA and the Project Team for implementing the pilot project.

The agenda for the meeting was as follows:

i) Explanation and mutual understanding of the role of WRUA Procurement Sub-Committee according to WDC guidelines,
ii) Explanation of the project supervisor as to outline of the pilot project, work scope, pre-qualification of bidders, method of notification of the pre-qualified bidders for bid proposal submission, process of the bidding, bid document, etc.,
iii) Discussion about pre-qualification criteria,
iv) Evaluation of pre-qualification documents submitted by the bidders who submitted "Expression of Interest" to the projects.

All the participants agreed above-mentioned matters, of which minutes of meeting is as per Appendix 3-22.

6.4.4 Community Contribution

WDC prescribes that the community that carries out the community activities under the WSTF fund should bear a certain rate of quota of the project cost.

The quota in Isiolo and Lumi regions, designated as Red Alert areas, is 15%.

The WDC requirement was therefore agreed upon to be used for the pilot project so that the

pilot projects would be implemented within the WDC framework project. And the Project Team therefore discussed with WRMA and WRUAs about the contribution requirement.

The Project Team proposed that the community members should supply cobble stones to be used for Gabion (wire mat) for revetment works in Isiolo pilot project, and that the community members should supply and install sandbags for road-raising in a school in Lumi pilot project.

Those proposals were discussed at the meeting with the community members, and they agreed to the proposals. Appendix 3-23 is Memorandum of Understanding (MOU) where the approval of the community members is mentioned.

6.4.5 Execution of Bidding and Contract

The bidding process was held on October 4, 2013 for Isiolo pilot project and on October 31, 2013 for Lumi pilot project and it was attended by respective chairman of WRUA Procurement Sub-Committee, the respective manager of WRMA Sub-Regional Office and the Project Team.

Immediately after the opening of bid proposals, contract negotiations were done and several matters concerning the contract and the works were confirmed.

Contractual processes including signing of the contracts were concluded on November 8, 2013 for Isiolo pilot project and on November 15, 2013 for Lumi pilot project.

6.4.6 Evaluation of Activities by WRMA and WRUA

During the implementation of pilot projects the Project Team review results were as follows:

- ✓ There is no WRUA which has conducted a process of procuring construction works for themselves. Therefore, the capacity of WRUAs, and procurement sub-committees thereof, on carrying out a bidding process is very limited. It was difficult for the WRUA members to contribute in the Procurement Committee meeting held together with WRMA and the Project Team. Therefore, a continued support to WRUAs by WRMA in the procurement process will be needed.

- ✓ Also, it seemed that the contents of the contract document were not all understood by the local contractors. The document had been simplified from WRMA's standard documents, but was still too thick. Further simplification of bidding documents/contract documents will be necessary.

6.5 Implementation of Environmental improvement of evacuation camp in Lumi Sub-catchment

The implementation of Environmental improvement of evacuation camp was carried out in Lumi Sub-catchment and entailed construction of raised evacuation hall, raised toilet, culvert placement to allow flood stream to flow, and access road that makes evacuation place accessible by the public road. This pilot project was implemented at the Eldoro Primary School which is located in the Taveta south as and falls under the jurisdiction area of Lower Lumi WRUA. The contract was made between the Project Team and the Contractor. However, the scheme of WDC manual is to be used in the future, and such construction works is expected to be implemented under the WRUA and therefore the contract would be with the WRUA and the Contractor. It was much assumed that the pilot project was to be implemented with WRUA from the process of the contract and implementation of construction works.

For the access road, the WRUA and community become subjects and implementer with consideration of WDC manual requirement of community contribution. The community members collected and transported soil that was material for construction. The community members constructed the access road by use of the sandbag industrial method.

Details of re-consignment contract as follows.

1) Name of the contract : Construction of Evacuation Facilities in Eldoro Primary School

2) Name of the re-consignment contractor : FRANJI ELECTRICALS & GENERAL SUPPLIES LTD
   - person in charge : Mr. Franji Njihia Chege, Director,
   - address : PO BOX 434 TAVETA KENYA
   - telephone number : 0725-936-355
   - e-mail : chegefranji53@yahoo.com

3) Construction duration period : November 18, 2013 to April 15, 2014
   Though the implementation period was three months when the contract commenced but because of interruption by the flood as results of heavy rainfall that affected even the construction site, that happened twice and by the instruction of Project Manager there was extension for time for completion that was done twice, therefore April 15, 2014 became the end of the implementation period.

4) Amount of contract : KSh 4,970,000.00- (bulk contract)

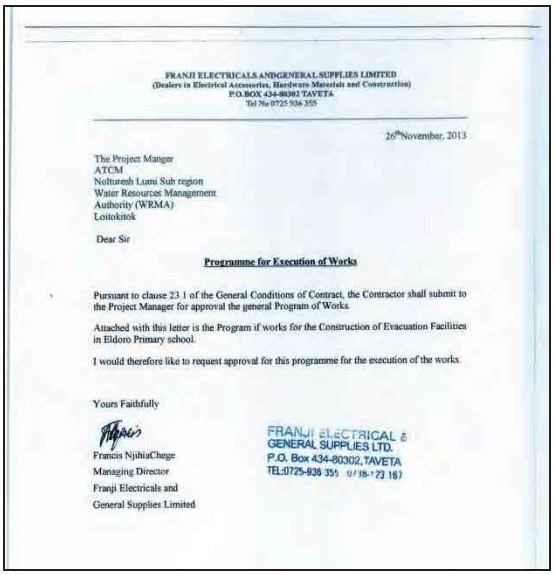
5) General description: raised evacuation place, raised toilet, construction of drainage culvert under road and collection and transportation of sediment for raised road

6.5.1 Implementation and construction management

FMO of WRMA on behalf of SRM of WRMA was the Project Manager and local supervisor of the Project Team assisted WRMA during the implementation of the Project.

In addition, WRUA sub- committee for monitoring also monitored the construction works according to the WDC manual during the implementation period.

Before the commencement of construction works the following work schedules were submitted by the contractor:



FRANJI ELECTRICALS ANDGENERAL SUPPLIES LIMITED
(Dealers in Electrical Accessories, Hardware Materials and Construction)
P.O.BOX 434-80302 TAVETA
Tel No 0725 936 355

26th November, 2013

The Project Manger
ATCM
Nolturesh Lumi Sub region
Water Resources Management
Authority (WRMA)
Loitokitok

Dear Sir

Programme for Execution of Works

Pursuant to clause 23.1 of the General Conditions of Contract, the Contractor shall submit to the Project Manager for approval the general Program of Works.

Attached with this letter is the Program if works for the Construction of Evacuation Facilities in Eldoro Primary school.

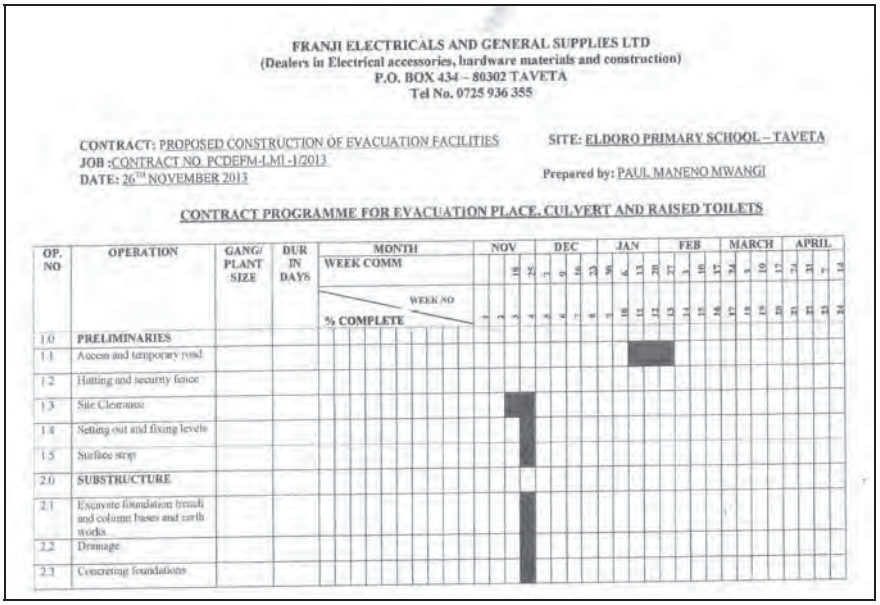
I would therefore like to request approval for this programme for the execution of the works.

Yours Faithfully

Francis NjihiaChege
Managing Director
Franji Electricals and
General Supplies Limited

FRANJI ELECTRICAL &
GENERAL SUPPLIES LTD.
P.O. Box 434-80302, TAVETA
TEL:0725-936 355

Submitted Work Schedule (1)



FRANJI ELECTRICALS AND GENERAL SUPPLIES LTD
(Dealers in Electrical accessories, hardware materials and construction)
P.O. BOX 434 – 80302 TAVETA
Tel No. 0725 936 355

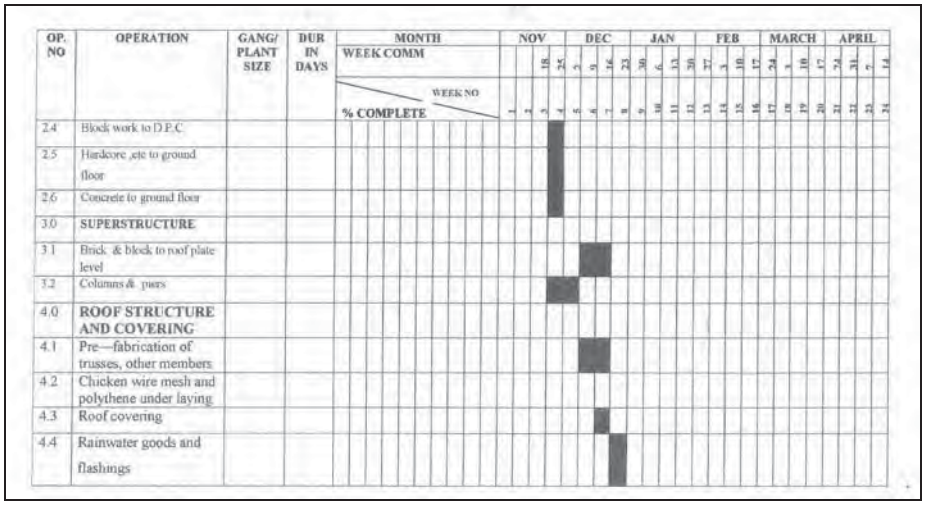
CONTRACT: PROPOSED CONSTRUCTION OF EVACUATION FACILITIES
JOB :CONTRACT NO. PCDEFM-LM1 -1/2013
DATE: 26TH NOVEMBER 2013

SITE: ELDORO PRIMARY SCHOOL – TAVETA
Prepared by: PAUL MANENO MWANGI

CONTRACT PROGRAMME FOR EVACUATION PLACE, CULVERT AND RAISED TOILETS

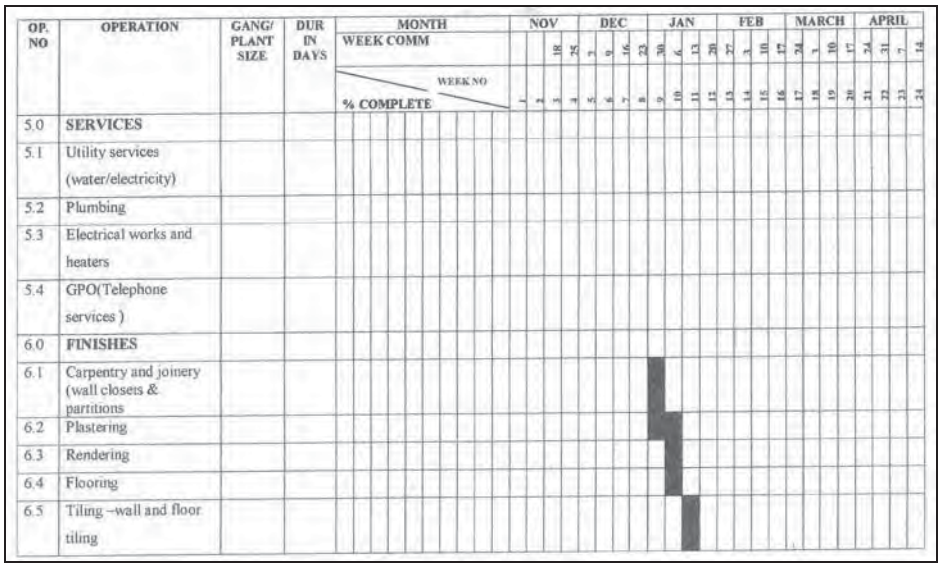
OP. NO	OPERATION	GANG/ PLANT SIZE	DUR IN DAYS	MONTH / WEEK COMM	NOV				DEC				JAN				FEB				MARCH				APRIL			
							18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	3	10	17	24	31	7	14
				% COMPLETE / WEEK NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1.0	**PRELIMINARIES**																											
1.1	Access and temporary road																											
1.2	Hitting and security fence																											
1.3	Site Clearance																											
1.4	Setting out and fixing levels																											
1.5	Surface strip																											
2.0	**SUBSTRUCTURE**																											
2.1	Excavate foundation trench and column bases and earth works																											
2.2	Drainage																											
2.3	Concreting foundations																											

Submitted Work Schedule (2)



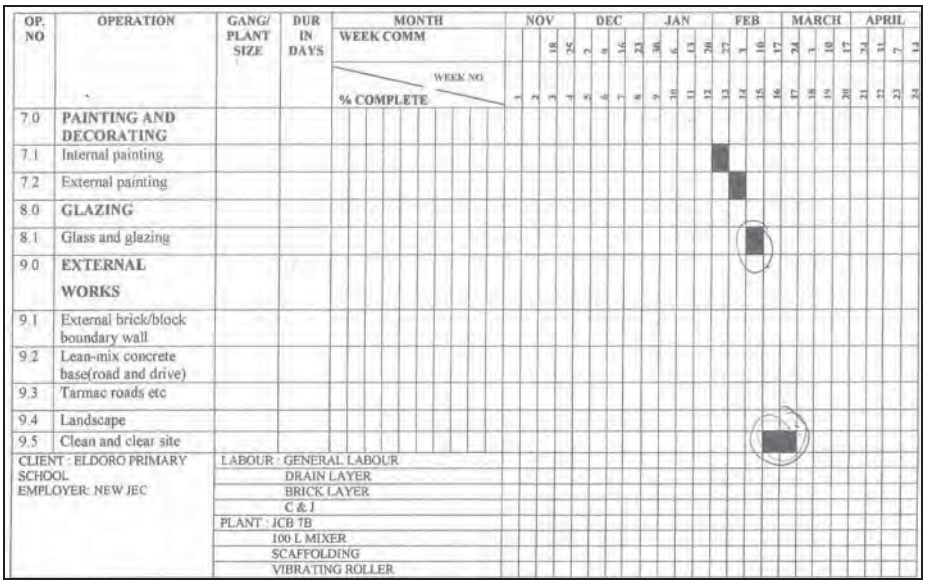
OP. NO	OPERATION	GANG/ PLANT SIZE	DUR IN DAYS	MONTH / WEEK COMM	NOV				DEC				JAN				FEB				MARCH				APRIL			
							18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	3	10	17	24	31	7	14
				% COMPLETE / WEEK NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
2.4	Block work to D.P.C																											
2.5	Hardcore ,ete to ground floor																											
2.6	Concrete to ground floor																											
3.0	**SUPERSTRUCTURE**																											
3.1	Brick & block to roof plate level																											
3.2	Columns & piers																											
4.0	**ROOF STRUCTURE AND COVERING**																											
4.1	Pre—fabrication of trusses, other members																											
4.2	Chicken wire mesh and polythene under laying																											
4.3	Roof covering																											
4.4	Rainwater goods and flashings																											

Submitted Work Schedule (3)



OP. NO	OPERATION	GANG/ PLANT SIZE	DUR IN DAYS	MONTH / WEEK COMM / WEEK NO / % COMPLETE	NOV	DEC	JAN	FEB	MARCH	APRIL
5.0	**SERVICES**									
5.1	Utility services (water/electricity)									
5.2	Plumbing									
5.3	Electrical works and heaters									
5.4	GPO(Telephone services)									
6.0	**FINISHES**									
6.1	Carpentry and joinery (wall closets & partitions									
6.2	Plastering									
6.3	Rendering									
6.4	Flooring									
6.5	Tiling –wall and floor tiling									

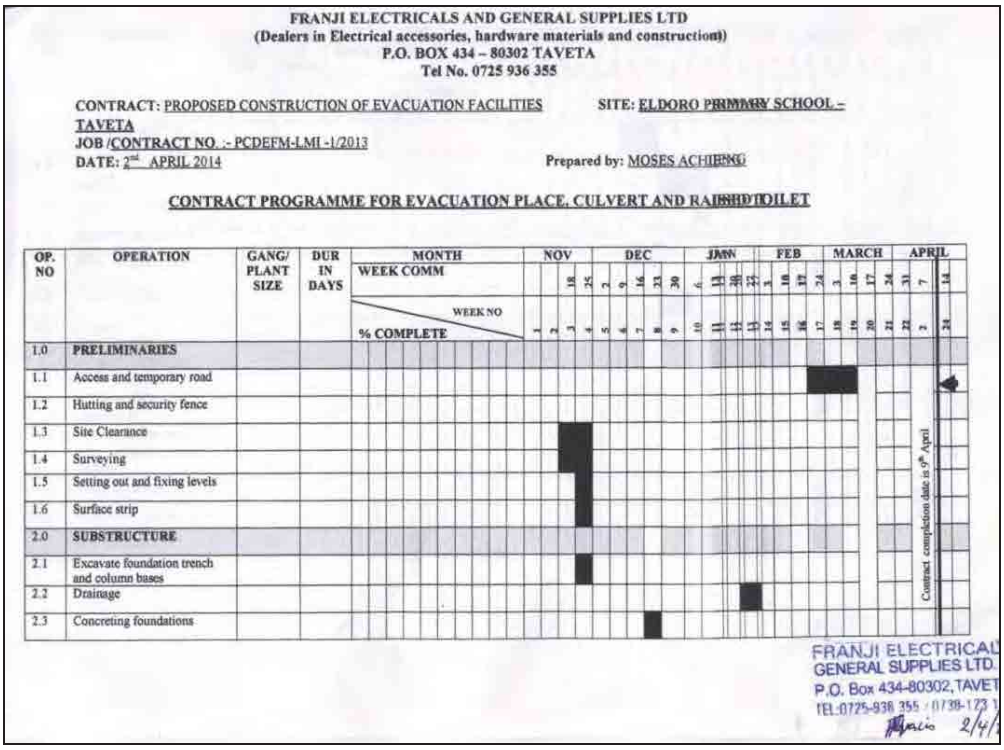
Submitted Work Schedule (4)



OP. NO	OPERATION	GANG/ PLANT SIZE	DUR IN DAYS	MONTH / WEEK COMM / WEEK NO / % COMPLETE	NOV	DEC	JAN	FEB	MARCH	APRIL
7.0	**PAINTING AND DECORATING**									
7.1	Internal painting									
7.2	External painting									
8.0	**GLAZING**									
8.1	Glass and glazing									
9.0	**EXTERNAL WORKS**									
9.1	External brick/block boundary wall									
9.2	Lean-mix concrete base(road and drive)									
9.3	Tarmac roads etc									
9.4	Landscape									
9.5	Clean and clear site									
CLIENT : ELDORO PRIMARY SCHOOL EMPLOYER: NEW JEC		LABOUR : GENERAL LABOUR DRAIN LAYER BRICK LAYER C & I PLANT : JCB 7B 100 L MIXER SCAFFOLDING VIBRATING ROLLER								

Submitted Work Schedule (5)

However, as described above, construction works was twice interrupted because the site was flooded because of the torrential rains, therefore, the term of works was extended for about two months. The contractor therefore submitted the following revised work schedule.



FRANJI ELECTRICALS AND GENERAL SUPPLIES LTD
(Dealers in Electrical accessories, hardware materials and construction)
P.O. BOX 434 – 80302 TAVETA
Tel No. 0725 936 355

CONTRACT: PROPOSED CONSTRUCTION OF EVACUATION FACILITIES SITE: ELDORO PRIMARY SCHOOL – TAVETA
JOB /CONTRACT NO. :- PCDEFM-LMI -1/2013
DATE: 2nd APRIL 2014 Prepared by: MOSES ACHIENG

CONTRACT PROGRAMME FOR EVACUATION PLACE, CULVERT AND RAISED TOILET

OP. NO	OPERATION	GANG/ PLANT SIZE	DUR IN DAYS	MONTH / WEEK COMM / WEEK NO / % COMPLETE
1.0	**PRELIMINARIES**			
1.1	Access and temporary road			
1.2	Hutting and security fence			
1.3	Site Clearance			
1.4	Surveying			
1.5	Setting out and fixing levels			
1.6	Surface strip			
2.0	**SUBSTRUCTURE**			
2.1	Excavate foundation trench and column bases			
2.2	Drainage			
2.3	Concreting foundations			

NOV: 18, 25 — DEC: 2, 9, 16, 23, 30 — JAN: 6, 13, 20, 27 — FEB: 3, 10, 17, 24 — MARCH: 3, 10, 17, 24, 31 — APRIL: 7, 14
WEEK NO: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 2 24

Contract completion date is 9th April

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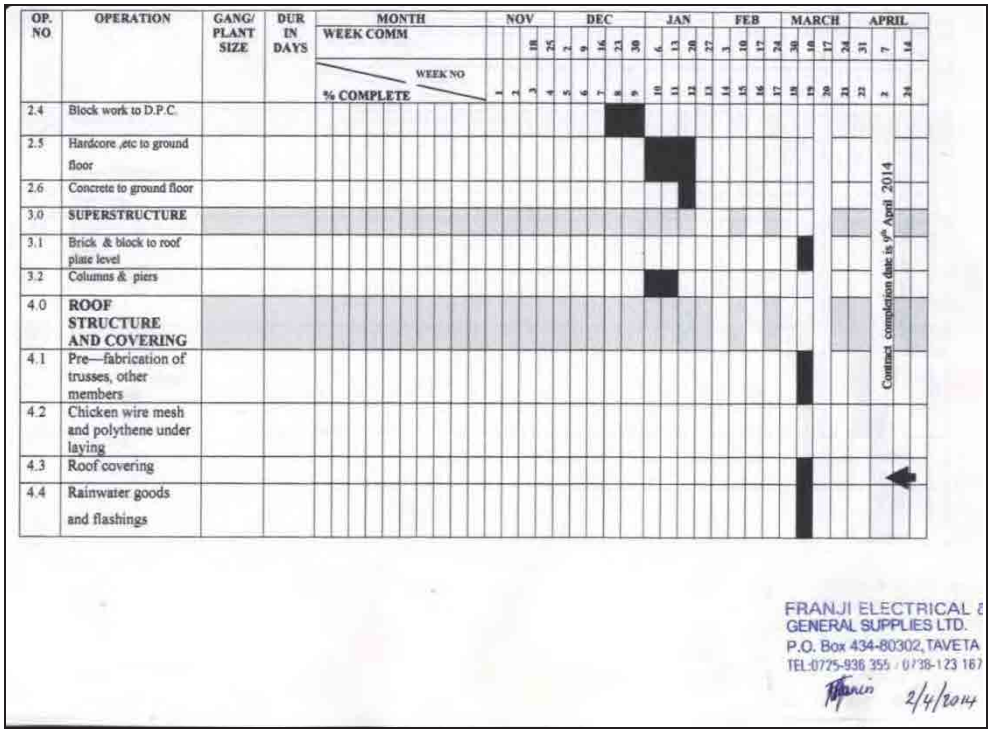
TEL:0725-936 355 / 0738-123
2/4/

Revised Work Schedule (1)



OP. NO	OPERATION	GANG/ PLANT SIZE	DUR IN DAYS	MONTH / WEEK COMM / WEEK NO / % COMPLETE
2.4	Block work to D.P.C.			
2.5	Hardcore ,etc to ground floor			
2.6	Concrete to ground floor			
3.0	**SUPERSTRUCTURE**			
3.1	Brick & block to roof plate level			
3.2	Columns & piers			
4.0	**ROOF STRUCTURE AND COVERING**			
4.1	Pre—fabrication of trusses, other members			
4.2	Chicken wire mesh and polythene under laying			
4.3	Roof covering			
4.4	Rainwater goods and flashings			

NOV: 18, 25 — DEC: 2, 9, 16, 23, 30 — JAN: 6, 13, 20, 27 — FEB: 3, 10, 17, 24 — MARCH: 3, 10, 17, 24, 31 — APRIL: 7, 14
WEEK NO: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 2 24

Contract completion date is 9th April 2014

FRANJI ELECTRICAL &
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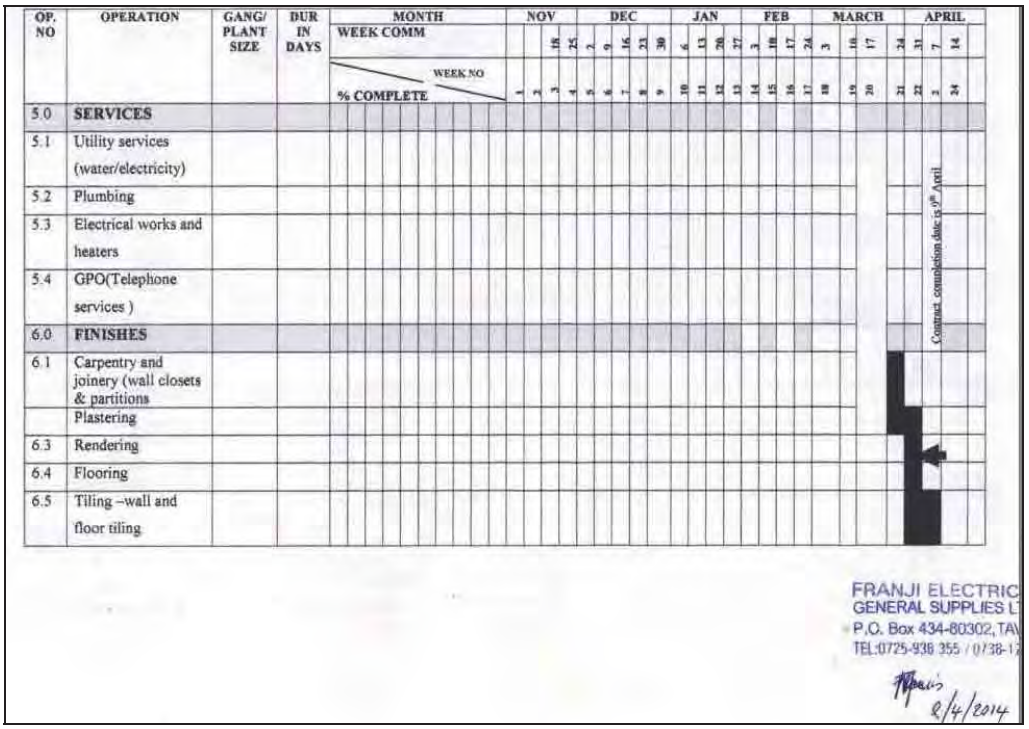
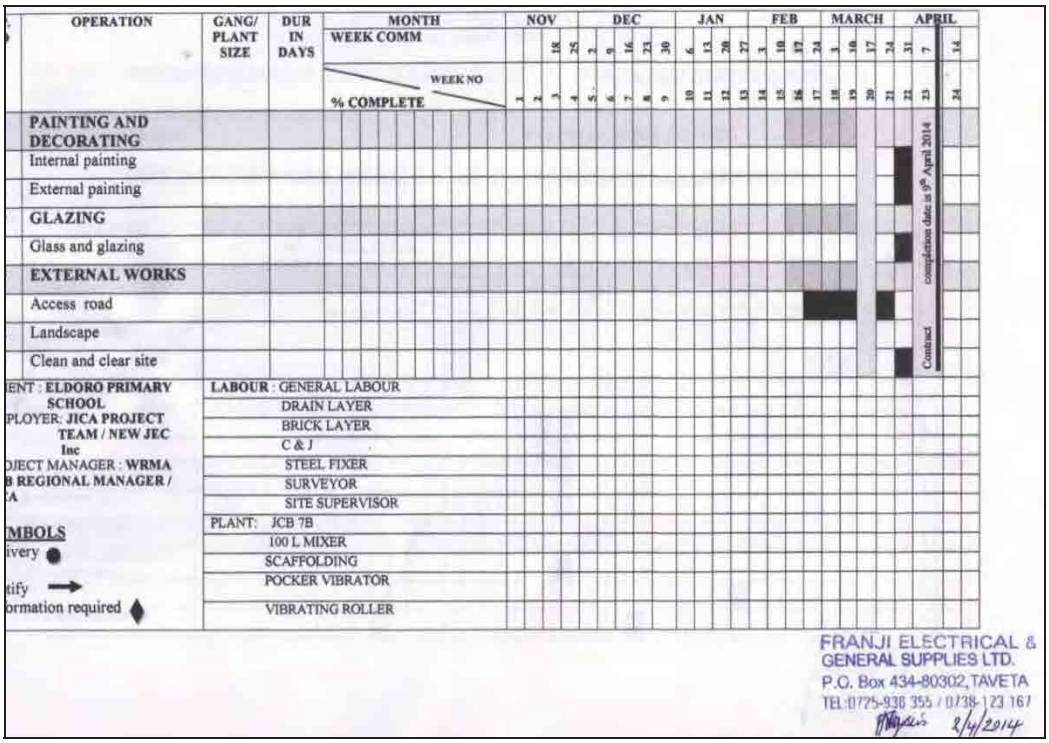
TEL:0725-936 355 / 0738-123 167
2/4/2014

Revised Wrok Schecule (2)



Revised Work Schedule (3)



Revised Work Schedule (4)

(1) Implementation process of entire works

Common processes of entire works are;

1) Clearance of the project site;
2) Survey works
3) Construction management matters including suspension of construction works and extension of works;

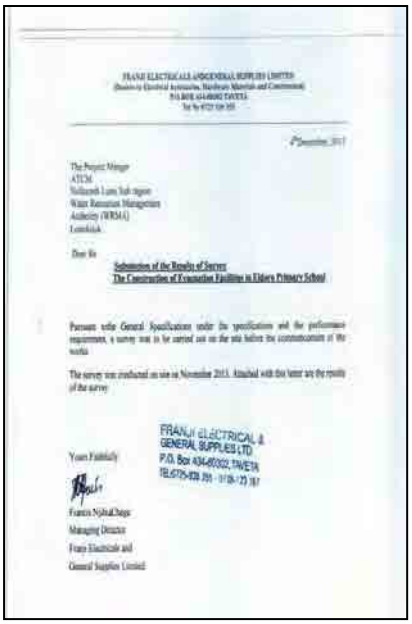
Details of these processes are described as follows.

1) Commencement of construction and clearance of the project site

The contractor commenced construction works on November 21, 2013 after the conclusion of contractual phase. He began his works by clearing the project site. It is highly suspected that there was a cash-flow problem, because the contractor requested the local supervisor before time for advance payment before even commencing the construction works based on the contract that indicated on the 18th.

2) Survey works

Survey was to be carried out on the site on November 30, 2013. Result of the survey was submitted by contractor to be shown on the letter.



FRANJI ELECTRICAL & GENERAL SUPPLIES LTD
P.O. Box 434-60202 TAVETA

Date : 25-11- 2013
Description: Clearance of the project site

Date : 30-11- 2013
Description : Surveying Works

3) 1st Suspension of construction works due to heavy rains and the flooding of the project site

Due to the rainy season, that pondered the area heavily on 9th of December 2013 that rendered the project site water logged and unsuitable for work. Therefore suspension of

construction works was allowed on 23rd of December 2013 until the site conditions improved. The clause below indicates provision for such suspension:

Pursuant to the Condition of the contract, the communication states that the contractor cannot execute the construction works due to heavy rains of the project site. Therefore due to the permission from contractor, it is possible to suspend the construction work temporarily in the judgment of PM.

The followings are Request for Permission for the Suspension of Construction Works from contractor and Permission to Suspend Construction Works from PM.

FRANJI ELECTRICALS AND GENERAL SUPPLIES LIMITED
(Dealers in Electrical Accessories, Hardware Materials and Construction)
P.O.BOX 434-80302 TAVETA
Tel No 0725 936 355

10th December 2013

The Project Manger
ATCM,
Nothuresh Lumi Sub- Region
Water Resources Management Authority (WRMA)
Loitoktok

Dear Sir

Request for Permission for the Suspension of Construction Works
The Construction of Evacuation Facilities in Eldoro Primary School

Pursuant to clause 27.1 of the General Conditions of Contract, the Contractor Shall warns the Project Manager at the likely event that events may interfere with the delay in the execution of works.

Due to the ongoing short rainy season the site conditions ate Eldoro Primary School has deteriorated and it is therefore not possible to continue with the construction works. There was an episode of very heavy rains in Eldoro on 9th of December 2013 rendering the project site water logged and unsuitable for work.

I would therefore like to request for permission to suspend the works until such a time that the site conditions will have improved.

WATER RESOURCES MANAGEMENT AUTHORITY

LOITOKTOK

11th December, 2013

FRANJI ELECTRICALS AND
GENERAL SUPPLIES LIMITED
ROBOX 434 TAVETA

Attn: Managing Director

Dear Sir,

PERMISSION TO SUSPEND CONSTRUCTION WORKS.

This is in reply to your letter dated 10th December 2013 concerning the adverse weather conditions on site in Eldoro Primary School.

Your communication states that you cannot execute the construction works due to unusually heavy rains and the flooding of the project site. Therefore pursuant to the Condition of Contract clause 25.2, I grant the permission for the suspension of the works until the site conditions improve.

Due to this suspension the intended completion date for the construction may be extended in future. However note that no extra payment will be made to the contractor on the account of this extension.

Yours faithfully,

Ronju Musau
ATCM
Nothuresh-Lumi Sub Region.
Water Resources Management
Authority (WRMA)
Loitoktok

Request for Permission for the Suspension of Construction Works by Contractor	Permission to Suspend Construction Works by PM

4) 2nd suspension of construction works due to heavy rains and the flooding of the project site

As a result of very heavy rains on 24th February 2014 that rendered the project site water logged and unsuitable for work, Permission for the Suspension of Construction Works from Contractor was requested on 25th February 2014, PM gave the permission.

FRANJI ELECTRICALS AND GENERAL SUPPLIES LIMITED

27th February, 2014

The Project Manager
ATCM
Water Resources Management Authority (WRMA)

Dear Sir

Request for Permission for the Partial Suspension of Construction Works
The Construction of Evacuation Facilities in Eldoro Primary School

Pursuant to clause 27.1 of the General Conditions of Contract, the Contractor Shall warn the Project Manager at the likely event that may interfere with the delay in the execution of works.

Due to the ongoing short rains the site conditions at Eldoro Primary School has deteriorated and it is therefore not possible to continue with all the construction works. There was an event of very heavy rains in Eldoro, Taveta on 24th of February 2014 rendering the project site flooded for the construction of the culvert, ... and unsuitable for construction works. The culvert works were supposed to commence from 24th February but we have to wait until the site situation improves. Also affected is the site for the toilet construction.

I would therefore like to request for permission to suspend the works until such a time that the site conditions will have improved.

Yours Faithfully

FRANJI ELECTRICAL & GENERAL SUPPLIES LTD.
P.O. Box 434-80302, TAVETA

Managing Director
Franji Electricals and General Supplies Limited

Request for Permission for the Suspension of Works by Contractor

WATER RESOURCES MANAGEMENT AUTHORITY

Fax
Office GSM:
Email: wrmaltk@yahoo.com

Noltuiresh Lumi Sub-Region
P O Box 53 - 00209
LOITOKITOK

26th February, 2014

FRANJI ELECTRICALS AND
GENERAL SUPPLIES LIMITED
P.O.BOX 434 TAVETA

Attn: Managing Director

Dear Sir,

PERMISSION TO SUSPEND CONSTRUCTION WORKS.

This is in reply to your letter dated 24th February 2014 concerning the adverse weather conditions on site in Eldoro Primary School.

Your communication states that you cannot execute the construction works due to unusually heavy rains and the flooding of the project site. Therefore pursuant to the Condition of Contract clause 25.2, I grant the permission for the suspension of the works until the site conditions improve.

Due to this suspension the intended completion date for the construction may be extended in future. However note that no extra payment will be made to you on the account of this extension.

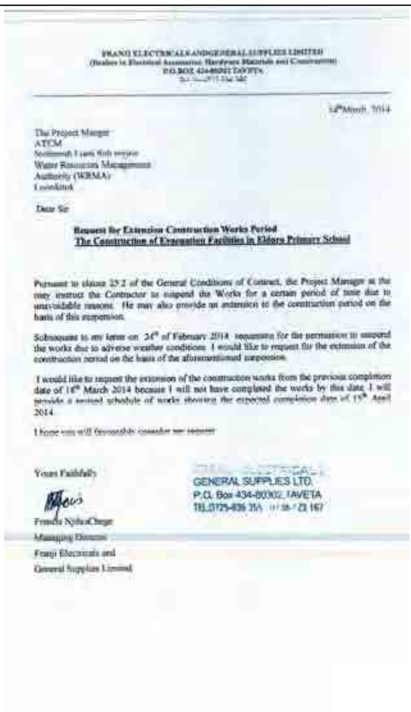
Yours faithfully,

Kimeu Musau,
Assistant Technical
Coordination Manager

Permission to suspend the works by PM

5) Extension of Works

Due to above mentioned twice Suspension of Works the intended completion date for the construction was extended to 15th of April 2014 on the basis of the request from the contractor.



FRANJI ELECTRICALS AND GENERAL SUPPLIES LIMITED

The Project Manager
ATCM
Water Resources Management Authority (WRMA)

Dear Sir

Request for Extension Construction Works Period
The Construction of Evacuation Facilities in Eldoro Primary School

Pursuant to clause 25.2 of the General Conditions of Contract, the Project Manager at the may instruct the Contractor to suspend the Works for a certain period of time due to unavoidable reasons. He may also provide an extension to the construction period on the basis of this suspension.

Subsequent to my letter on 24th of February 2014 requesting for the permission to suspend the works due to adverse weather conditions I would like to request for the extension of the construction period on the basis of the aforementioned suspension.

I would like to request the extension of the construction works from the previous completion date of 18th March 2014 because I will not have completed the works by this date. I will provide a revised schedule of works showing the expected completion date of 15th April 2014.

Yours Faithfully

GENERAL SUPPLIES LTD.
P.O. Box 434-80302, TAVETA

Managing Director
Franji Electricals and General Supplies Limited

Request for Extension Construction Works Period by Contractor

WATER RESOURCES MANAGEMENT AUTHORITY

LOITOKITOK

17th March, 2014

FRANJI ELECTRICALS AND
GENERAL SUPPLIES LIMITED
P.O.BOX 434 TAVETA

Attn: Managing Director

Dear Sir,

EXTENSION OF COMPLETION DATE FOR CONSTRUCTION WORKS

In your letter dated 25th February 2014 you raised issues concerning the adverse weather conditions on site in Eldoro Primary School. Subsequently the construction works on the site were suspended between 24th February and 4th March 2014.

Due to this suspension the intended completion date has to be extended to account for the non-working days. Taking this into account and pursuant to Clause 1.1(o) the intended completion date for the project is extended from 18th March 2014 up to 15th April 2014.

However note that no extra payment will be made to you on the account of this extension.

Yours faithfully,

Kimeu Musau,
Assistant Technical
Coordination Manager

Permission for Extension of Completion date for Construction Works by PM

(2) Evacuation camp

1) Foundation Excavation

Foundation excavation works begun on 2nd of December 2013 by use of manpower.

	
Foundation Excavation Date：6th of December 2013	Suspension of Works due to the flood Date：19th of December 2013

2) Foundation Works

The contractor drained collected water from the excavated places by use of the drainage pump, and once the water was cleared from the foundation. The foundation work therefore continued with the concrete placement and the post was implemented on 4th of December 2013.

Installation of foundation wall begun on 29th of December 2013, and was completed on 7th of January 2014. After that, foundation was backfilled and tamping with Malham and surface was backfilled and tamping with crushed stone.

On the day of 13th of February 2014, foundation was installed with raised Malham, and tamping. Wet masonry method work on the surface of these Malham was implemented. On the day of 21st of February 2014, Wet masonry method in surroundings of the Malham foundation was continuously implemented. On the day of 1st of March 2014, Wet masonry method of the foundation was carried out.

	
Foundation Works Date：2nd of January 2014	Foundation Wet Masonry Method Works Date：1st of March 2014

3) Shed

The reinforced concrete of the beam and the support was assembled to be installed, and was completed on 13th of February 2014.

On the day of 1st of March 2014, brick for the wall was not purchased, and the construction of the wall that was scheduled to be begun on Wednesday did not commence. Roof truss member was delivered and assembly started. Construction of the wall begun on 3rd of March 2014. On the day of 7th of March it was scheduled for the roof truss member to have assembled, and to be lifted.

	
Roof Truss Member Date : 1st of March 2014	Assembled Roof Truss Member Date : 7th of March 2014
	
Construction of the Wall Date : 7th of March 2014	Installation of Window Frame Date : 8th of March 2014
	
Installation of Roof Truss Date : 11th of March 2014	Installation of Roof Top Date : 12th of March 2014

	
Inside of Finishing Works Date：12th of March 2014	Outside of Finishing Works Date：18th of March 2014
	
Finishing Work of Floor Date：28th of March 2014	Installation of Window Frame Date：7th of April 2014
	
Completion of outside Date：7th of April 2014	Completion of Inside Date：7th of April 2014

(3) Raised Toilet

1) Pit

Excavation of toilet pit commenced on the 31st day of December 2014. However, the high ground-water level was a big problem. Excavation was done at the same time the drainage of water by use of the drainage pump was also done.

On the day of 13th of February 2014, construction of pit was done. The reinforcement of concrete was completed, and the first concrete up to the height of 1.2m was placed. And the installation of the second placement was completed. However, there was the problem of seepage of water into the pit. In addition, there was a problem on the wall of

the excavated pit that had collapsed as a result of rain that pondered the area the previous week. And therefore there was work of removal of mud from the pit was in addition to the drainage work. The work place in the bottom of the pit paved with crushed stone and was strengthened.

On the day of 21st February 2014, the contractor made the mould, and divided it into few layers, and thereafter implemented concrete placement. Height stood up to 1.1m by the concrete placement in the fourth layer, and the construction of the pit was completed.

	
Drainage from Toilet Pit Date：3rd of January 2014	Removal of mud in the Pit Date：8th of January 2014
	
Reinforcement concrete of Toilet Pit Date：13th of January 2014	Reinforcement concrete of Toilet Pit Date：22nd of January 2014
	
Form of Toilet Pit Date：3rd of February 2014	Concrete Placement of Toilet Pit Date：13th of January 2014

2) Building

Reinforcement concrete of steps and floor was completed and installed on 28th of February 2014. The construction work of the wall begun on 12th of March 2014 while the construction of the roof was implemented on 12th of March 2014. The door was placed in and finished on 18th of March 2014, and it was completed on 7th of April 2014.

	
Raised Toilet Pit Wall Date：24th of February 2014	Reinforcement of Steps and Floor Slabs Date：28th of February 2014
	
Reinforcement of Floor Slabs Date：28th of February 2014	Concrete placement of Floor Slabs Date：28th of February 2014
	
Curing of Reinforcement of the support and Floor Slabs Date：4th of March 2014	Construction of Toilet Wall Date：7th of March 2014
	
Construction of the Roof Top Date：12th of March 2014	Preparation of Installation of the door Date：18th of March 2014

	
Finishing Works Date：18th of March 2014	Façade of the Toilet Completion Date：7th of April 2014

(4) Culvert

On 2[1st] of February 2014, the contractor bought pipe culvert of 900mm in the diameter from Ministry of Works of Taveta, and it was inspected at the Ministry's garden. And cutting the reinforcement of the culvert and processing of the bend begun. On the day of 28th of February, Permission to excavate the road was carried out from KeRRA to the contractor. Therefore the reinforced base slabs were completed.

Excavation for culvert commenced on 1st of March 2014. Leveling concrete was filled at the bottom on Tuesday after pumping out the underground water. And the concrete work of the bottom slab was completed on 6th of March 2014, and the reinforced slab of the side and the upper part was placed on 7th of March 2014.

There was an accident that occurred when the culvert was under construction and the worker suffered slight injuries this was on 3:30PM, Friday, March 7, 2014. The outline of the accident is as shown in the following table below.

(1) Date（local time）	Around 3:30 PM, Friday, March 7, 2014
(2) Site	Taita Taveta county、Taveta district、ボメニ・division、キモリゴ・location、Eldoro sub location、local road near the Eldoro school（KeRRA）
(3) Content	The concrete pipe was damaged while constructing the culvert installation for the drainage of the road laying underground, the fragment hit to worker's upper part of the instep, and it got a cut.
(4) Toll （ Human damage （ nationality, casualties 、 occupation 、 age 、 detailed information such as injury part etc. is described as much as possible）、physical damage、social impact, etc.）	Name：Mzee James（male, age of 40） Type：cut Overall time：It is necessary to suture the cut, and to inject the tetanus prevention of three days. Treatment was received on that day of the accident, and it left hospital on the same day. The injured person was unskilled worker of temporary employment from the Eldoro Community.
(5) Type and Causal agents（MHLW）	Flying, Falling
(6) Current status （ Included Information of Ongoing and Suspension ）, Progress of emergency response	Ongoing

<Cause>

The accident occurred by the pipe's falling when the plain concrete pipe used as a mould

of the culvert for the road laying underground was rolled, carried, and installed in the channel, knocking against the bottom concrete slab, and thereby cracked. It is a structure to put the reinforced concrete in a surrounding bottom, side, and upper concrete though the pipe is plain, and this design method and the construction technique are general in Kenya. The contractor explained that it happened to be broken the pipe occasionally during the transportation or installation.

<Lesson>

The contractor changed the production site from KeRRA at Taveta away with the host site to the host site for the remainder of the concrete pipe production so that similar accident should not occur during transportation.

<Others>

Prevention : Pay attention to the safety measures again, and fail safe to the workers.

Prompt report : The importance of the report at the accident was reconfirmed in the team, and the correspondence at the time of the black out.

Inspection for Ministry of Works
Date : 21st of February 2014

Reinforced bottom slabs
Date : 21st of February 2014

Excavation
Date : 1st of March 2014

After Drainage
Date : 5th of March 2014

	
Production of the pipe at the site Date : 10th of March 2014	Broken pipe during installation with tumbling into the channel Date : 10th of March 2014
	
Concrete pipe of 3 inches （7cm） in thickness Date : 10th of March 2014	Pipe falls from approximately 60cm in height and damages. Date : 10 th of March 2014

(5) Raised Access Road by Community Contribution

Raised access road as community contribution was constructed by the school community and WRUA members. The contractor collected, carried Malham that became a material soil, and the community offered sand bags and undertook the construction. Involvement in the community and OJT are described later.

The Project Team held a preparatory meeting for commencement of work wherein the community contribution by community members and WRUA members was agreed upon. The community members therefore participated in sand bag training on 24th of February 2014.

The head of the school instructed the pupils to go to the school with their parents for a meeting where the discussions were held also the School Management Committee chairperson attended the meeting held on February 28, 2014. The Parents were divided into four groups based on the village because there are four villages in Eldoro Sub Location. Four days were therefore scheduled to be taken for completion of road construction. Positioning of the site was done on 28th of February 2014.

Road construction with sand bag by WRUA and the school community also begun on March 3, 2014, and completion ceremony was on 14th of March 2014, and the access road was completed.

	
Positioning Date : 28th of February 2014	Preparation for installed sand bags Date : 3rd of March 2014

6.5.2 Involvement and contribution of the community

The Eldoro Primary School in the Kimorigho district of Lower Lumi is the flood prone area that was selected as a place for implementation of the activity. Progress of the activity is shown below:

After the discussion during the second Integrated Flood Management Committee (IFMC), the community sensitization with the active participation of WRUA and community was implemented in the early days of September. The participants' agreement was reached for construction of raised evacuation hall, raised access road, raised toilet, and drainage culvert as part of improving the environment of evacuation place. Mutual agreement of implementation of raised evacuation road construction with sand bag method was reached as community contribution is indispensable to community disaster prevention.

The procurement committee meeting was held in the middle of September, and bid opening was held at the end of October with participation of WRUA member. Sand bag method training was held to be used during the construction of the raised evacuation road in December and mid-January.

It was predetermined that the trained interns were to become leaders in future during road construction and the policy of promoting the evacuation road construction on site was confirmed.

Table 6.5-1 Lumi district: Activities on Construction Works of Evacuation Place at Eldoro Primary School

Date	Activity	Participation
22/02/2013	1st Integrated Flood Control Management Committee	Participation of Lower Lumi WRUA and Upper Lumi WRUA chairperson
16/08/2013	2nd Integrated Flood Control Management	Participation of Lower Lumi WRUA and Upper Lumi WRUA chairperson
04/09/2013	Briefing for Local Residents	➢72 participants（of which, 2 chiefs, 10 school teachers, approximately 20 SMC of primary school, approximately 20 WRUA, approximately 10 WRMA, and 4 KRCS） Implementation of the pilot project of

Date	Activity	Participation
		evacuation place development at Eldoro primary school（ Raised Evacuation Place, Raised access road, Raise Toilet, Drainage culvert ）was agreed by participants. ➢Project Team explained that over 15% Community contribution by provision of local resource such as labor, materials and services was necessary for implementation of the pilot project in WDC and agreed by participants. ➢It was also agreed that evacuation road by Do-nou method was constructed as the community contribution.
02/09/2013	Meeting with TaitaTaveta County Prefectural Governor	➢Cooperation on priority implementation of bank reinforcement works to mitigate the physical flood disaster damage was requested to WRUA and the Project Team by County government.
20/09/2013	Procurement Committee	➢ Procurement committee was held with WRUA subcommittee members through the technical transfer by evaluation of contractors and preparation of short list.
27/09/2013	Meeting between Disaster Prevention Supervisor and Local Residents	➢It was confirmed that local residents could provide bags, put sand procured by contractors to bags and carry sand bags to construction sites. ➢They also made comments that procedures of installation compaction of sand bags and gravel placement were inadequate to execute.
31/10/2013	Bidding Opening Ceremony	➢Chairperson of WRUA sub procurement committee participated in the ceremony. ➢Evaluation of bidding documents was implemented in collaboration with WRMA and PROJECT TEAM.
18/11/2013	Contract Agreement	
21/11/2013	Commissioning of Construction Works	➢Cutting and measurement works was started.
06/12/2013	Meeting between WRUA and Community	➢Community and some WRUA members had jointed the training of Do-nou works which was prepared by NGO (CORE) who promotes Do-nou method at another site. ➢PROJECT TEAM proposed that participants of this training were assigned to the leader and promoted the construction of evacuation road and selected members under approvals by WRUA and local community. ➢Members were composed of 8 persons of 3 WRUA, 3 Community, 1 WRMA-SRO and 1 Disaster Prevention Supervisor.
27/12/2013	Submission of BankGurantee by Contractor for Advance Payment	➢ Bank guarantee for advance payment and correspondent bank information for the cash transfer was submitted. ➢Advance payment was transferred on 14/01/2014.
15-16/01/2014	Training of Do-nou Work	➢ WRUA and Community member joined the training of Do-nou method prepared by CORE at Kiambu located at 15km northern part of Nairobi.

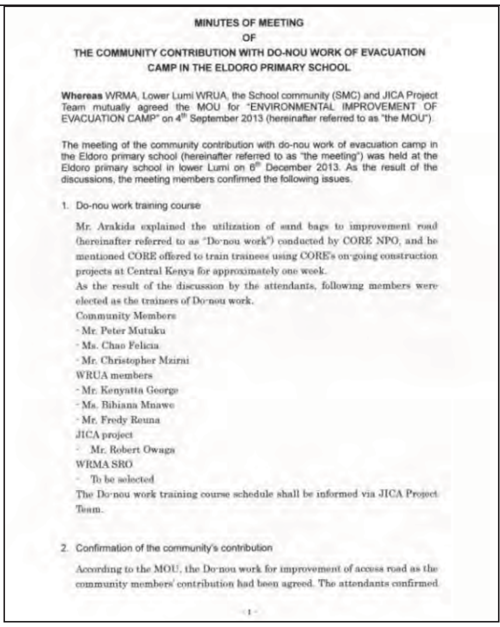
Main activities by the joint WRUA members and Community members are described below:

- Consensus building of the contribution by Community
- Participations in the training of Do-nou method
- Procurement of materials by WRUA
- Monitoring of construction works by WRUA

(1) Consensus building for the contribution by Community

Community sensitization of the residents was held on 04/09/2013 at Eldoro Primary school and in attendance was WRMA, Lower Lumi WRUA, School Community and Project team. Based on the WDC manual, local residents' contribution was over 15% of project budgeted was agreed between Lower Lumi WRUA and Community members. Contribution by local residents was implemented by the provision of labor, materials and services. In addition, procurement of bags and stuffing of sand for the improvement of access road were also regarded as the contribution.

A meeting between WRMA, WRUA and School Management Committee (SMC) was held on 06/12/2013. Project team proposed to WRUA and Community to contribute to the pilot project by procurement of bags and the construction of access road by Do-nou method and explained that they could participate in the training of Do-nou construction method. As a result, they answered that it was possible to implement the proposed number of participants as 6 persons (2 WRUA, 2 Community, 1 WRMA-SRO and 1 disaster prevention supervisor). However they requested to select 3 persons from the WRUA and Community in order consider the gender balance and Project Team accepted their request. Project Team also requested them to implement the construction of evacuation road by Do-nou method under the guidance of the persons who were selected for the training and were to be leaders during road construction, and to arrange approximately 20 members for labours purposes per day for execution of construction works within the construction period. WRUA and Community also agreed to these requests.



MINUTES OF MEETING
OF
THE COMMUNITY CONTRIBUTION WITH DO-NOU WORK OF EVACUATION CAMP IN THE ELDORO PRIMARY SCHOOL

Whereas WRMA, Lower Lumi WRUA, the School community (SMC) and JICA Project Team mutually agreed the MOU for "ENVIRONMENTAL IMPROVEMENT OF EVACUATION CAMP" on 4th September 2013 (hereinafter referred to as "the MOU").

The meeting of the community contribution with do-nou work of evacuation camp in the Eldoro primary school (hereinafter referred to as "the meeting") was held at the Eldoro primary school in lower Lumi on 6th December 2013. As the result of the discussions, the meeting members confirmed the following issues.

1. Do-nou work training course

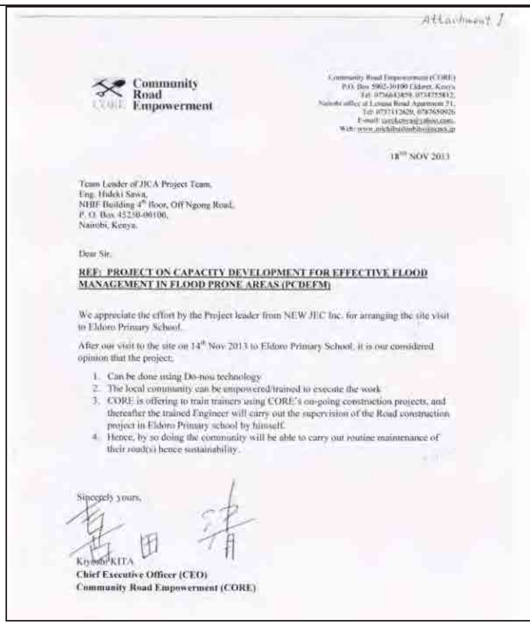
Mr. Arakida explained the utilization of sand bags to improvement road (hereinafter referred to as "Do-nou work") conducted by CORE NPO, and he mentioned CORE offered to train trainees using CORE's on-going construction projects at Central Kenya for approximately one week.
As the result of the discussion by the attendants, following members were elected as the trainers of Do-nou work.
Community Members
- Mr. Peter Mutuku
- Ms. Chao Felicia
- Mr. Christopher Mzirai
WRUA members
- Mr. Kenyatta George
- Ms. Bibiana Mnawe
- Mr. Fredy Reuna
JICA project
- Mr. Robert Owaga
WRMA SRO
- To be selected
The Do-nou work training course schedule shall be informed via JICA Project Team.

2. Confirmation of the community's contribution

According to the MOU, the Do-nou work for improvement of access road as the community members' contribution had been agreed. The attendants confirmed

- 1 -

MOU on participants of the training of Do-nou method



Attachment 1

Community Road Empowerment

18th NOV 2013

Team Leader of JICA Project Team,
Eng. Hideki Sawa,
NHIF Building 4th floor, Off Ngong Road,
P. O. Box 45250-00100,
Nairobi, Kenya.

Dear Sir,

REF: PROJECT ON CAPACITY DEVELOPMENT FOR EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS (PCDEFM)

We appreciate the effort by the Project leader from NEW JEC Inc. for arranging the site visit to Eldoro Primary School.

After our visit to the site on 14th Nov 2013 to Eldoro Primary School, it is our considered opinion that the project:

1. Can be done using Do-nou technology
2. The local community can be empowered/trained to execute the work
3. CORE is offering to train trainers using CORE's on-going construction projects, and thereafter the trained Engineer will carry out the supervision of the Road construction project in Eldoro Primary school by himself.
4. Hence, by so doing the community will be able to carry out routine maintenance of their road(s) hence sustainability.

Sincerely yours,

Kiyoshi KITA
Chief Executive Officer (CEO)
Community Road Empowerment (CORE)

Acceptance letter for training of Do-nou method

(2) Participations in the training of Do-nou method

3 Lower Lumi WRUA member, 3 SMC of Eldoro Primary School members, and 1 WRMA Loitokitok SRO staff joined the training of Do-nou method prepared by NOG (Community Road Empowerment (CORE)) at Kiambu on the schedule of 14-17/01/2014.

1) Schedule

14/01/2014 transfer from Taveta to Nairobi

15/01/2014 transfer from Nairobi to Kiambu, lecture and training
16/01/2014 training
17/01/2014 transfer from Kiambu to Taveta

2) Participants

Organization	Participant
Eldoro Primary School Management Committee	- chairperson（male） - 1 female - 1 male
Lower Lumi WRUA	- secretary（male） - 1 female - 1 male
WRMA Loitokitok SRO	- 1 FMO
JICA Project Team	- Local supervisor

3) Training

Do-nou method was explained in a short briefing, and was demonstrated by CORE member while receiving help of two young persons from the group. After that, there was participation on the road improvement training that the two young group implemented.

The trainee implemented the procedure of the following Do-nou method.

i) Positioning : The crossing type of the road that had to be repaired was positioned. The width of 4m in tamping with sand bag, 1 m clearance in both sides, and the drainage channel besides the clearance was measured by both sides.

ii) Proper size for sand bag : Proper size for sand bag is 450mm×600mm. The advantage is easy to carry with murram in the bag, and easy to do tamping properly.

iii) Bagging : The soil of 20kg is packed into sand bag by measuring with 16L can that was cut and made from 20L can.

iv) Fastening : Tie a string to the sand bag, inside soil is prevented from overflow even if it was tamped. The length of the string has to be 40cm.

v) Arrangement and Tamping : sand bag has to line up systematically for proper tamping , and do tamping, and be covered with soil for preventing from the sunlight. Tamping enough sand bags were endured by 25t axle load. Recommended times of tamping is at least 20 per bag.

vi) Drainage : It is possible to drain safely at appropriate intervals by collecting rain water by the drainage channel being installed on both sides of the road.

4) Labor segmentation

Each group was composed of approximately twenty five (25) people. CORE member recommended that 25 was the best number of people to ensure proper construction. Therefore, the eight (8) participants from the training were divided into three groups.

The 1st group constructed drainage channel on the right, the 2nd group constructed drainage channel on the other side, and the last group put the soil into sand bag.

After these works were completed, sand bag was arranged and tamping was implemented all together. It was therefore possible to construct approximately 30m of the road for one day, i.e. if there are enough material and equipment for the groups. Usually the construction works commenced each day at eight in the morning, takes a short break around noon, and ends at two in the afternoon. It was agreed that the works be done in the morning to avoid working in high temperature because the road construction was very hard work.

Trainee also participated the training at Kamuchege district in flat land similar to Eldoro Primary School on 15th of January 2014. They visited Kathuguu district in slope land on the following day.

5) Cooperation with KeRRA

The trainee learnt the procedure for registering in the county government and KeRRA as an authority tasked with road maintenance.

	
Standard sand bag Date：15th of January 2014	Positioning with string and pin Date：15th of January 2014
	
Arrangement of sand bag by WRUA member Date：15th of January 2014	Tamping（at least 10 times） Date：15th of January 2014

	
Covered with soil Date：15th of January 2014	Tamping of covered soil Date：15th of January 2014

(3) Procurement of equipment by WRUA

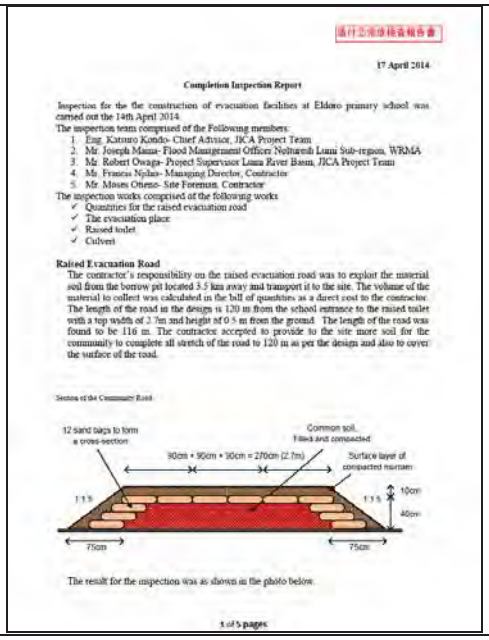
The capital was loaned to WRUA procurement subcommittee by the Project Team, and the necessary required materials for Do-nou method were purchased to experience the procurement of the goods. The capital was remitted from the Project Team on 14th February, 2014, and the purchase of the goods was implemented on 17th February 2014.

6.5.3 Completion inspection report

The completion of the structure was confirmed by three parties i.e. FMO, Project Team, and contractor as a representation of WRMA Loitokitok Rub Regional Office manager of PM, and Completion Inspection Report was made on 14th of April 2014. As a result, Completion Certificate was issued by PM on 17th of April 2014.

The following two points were pointed out in completion inspection report.

1) Exchange of broken window
2) Addition of soil for access road of Community

 17 April 2014 **Completion Inspection Report** Inspection for the the construction of evacuation facilities at Eldoro primary school was carried out the 14th April 2014. The inspection team comprised of the Following members: 1. Eng. Katsuro Kondo- Chief Advisor, JICA Project Team 2. Mr. Joseph Maina- Flood Management Officer Nelturesh Luni Sub-region, WRMA 3. Mr. Robert Owaga- Project Supervisor Luna River Basin, JICA Project Team 4. Ms. Frances Nyhus- Managing Director, Contractor 5. Mr. Moses Otieno- Site Foreman, Contractor The inspection works comprised of the following works ✓ Quantities for the raised evacuation road ✓ The evacuation place ✓ Raised toilet ✓ Culvert **Raited Evacuation Road** The contractor's responsibility on the raised evacuation road was to exploit the material soil from the borrow pit located 3.5 km away and transport it to the site. The volume of the material to collect was calculated in the bill of quantities as a direct cost to the contractor. The length of the road in the design is 120 m from the school entrance to the raised toilet with a top width of 2.7m and height of 0.5 m from the ground. The length of the road was found to be 116 m. The contractor accepted to provide to the site more soil for the community to complete all stretch of the road to 120 m as per the design and also to cover the surface of the road. Section of the Community Road 12 sand bags to form a cross-section Common soil... Filled and compacted 90cm + 90cm + 90cm = 270cm (2.7m) Surface layer of compacted murram 1:1.5 1:1.5 10cm 40cm 75cm 75cm The result for the inspection was as shown in the photo below. 1 of 5 pages	 WATER RESOURCES MANAGEMENT AUTHORITY CONSTRUCTION OF EVACUATION FACILITIES COMPLETION CERTIFICATE This is to state that the proposed works for The Construction of Evacuation Facilities in Eldoro Primary School in Trans Mara District has been constructed in accordance with the conditions contained in the contract PCEM/SM-Luni-1/2013. We certify that the above works were inspected and found to conform to the specifications applicable to the contract documents and are ready for effective operation.
Completion Inspection Report	Completion Certificate

6.5.4 Delivery of facilities and equipment

Facilities for Do-nou method were delivered by JICA to WRMA, and from WRMA to Lower Lumi WRUA at the Pre-completion ceremony on 11th of March 2014.

	
Delivery of facilities and equipment from JICA to WRMA Date: 11th of March 2014	Delivery of facilities and equipment from WRMA to Lower Lumi WRUA Date : 11th of March 2014

Four parties i.e. WRMA, WRUA, School Community, and Project Team concluded MOU of maintenance and ownership of facilities and equipment on 17th of April 2014.

The contents of MOU are as follows.

1. *The property rights of facilities and tools shown in the list of Attachment 1 shall be transferred to Lower Lumi WRUA from WRMA having received the same from JICA Project Team after completion of the construction work;*
2. *The ordinary maintenance of those facilities shall be done by the Eldoro Primary School, School Management Committee (SMC) in cooperation with the Lower Lumi WRUA;*
3. *A steering committee for the coordination of operation of the evacuation camp shall be established by WRMA, Lower Lumi WRUA and the Eldoro Primary School SMC and some other members can be added if necessary;*
4. *The operation rules of the evacuation camp and the evacuation plan shall be formulated by the steering committee through the discussion with relevant organizations such as Kenya Red Cross Society, World Vision and the Government of Taita-Taveta County;*
5. *The actual operation for the evacuation camp during floods shall be done by the Eldoro Primary School SMC in liaison with the Lower Lumi WRUA;*
6. *The income generated from these facilities, if any, shall be managed by the Eldoro Primary School SMC and reported to the Lower Lumi WRUA. The SMC shall in consultation with the Lower Lumi WRUA use the income generated for the operation and maintenance of these facilities;*

Besides, Certificate of Handover included facilities and equipment of both Isiolo and Lower Lumi were exchanged between Project Team and WRMA on 25th of April 2014.

Concerning the structures for maintenance etc., according to the MOU that mentioned above, daily maintenance of the facilities will be done by Eldoro Primary School Management Committee (SMC) with cooperation of Lower Lumi WRUA.

The implementation committee that will arrange the operation of evacuation centres will be established mainly by WRMA, Lower Lumi WRUA and Eldoro Primary School's SMC.

Although the funds or collection of the facility using fee is not decided at the period of July 2014, the member should notice and report to SMC when the member use the facilities.

CERTIFICATE OF HANDOVER

PROJECT TITLE: *PROJECT ON CAPACITY DEVELOPMENT FOR EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS*

This is to certify that facilities and tools in the list below for above-mentioned project have been handed over properly as of 25 April 2014 to Water Resources Management Authority, Republic of Kenya.

List of Facilities and Tools

No.	Name of Item	Unit	Qty	Place	Date of Handover
1	Riverbank protection using gabion mattress along the Eastern Marania River at Matunakita Full Gospel Church	Set	1	Middle Ewaso Ng'iro (north) SRO	25 April 2014
2	Mattock complete with handle	Pcs	5	Ditto	Ditto
3	Shovel complete with handle	Pcs	5	Ditto	Ditto
4	Wheelbarrow	Pcs	5	Ditto	Ditto
5	Masons hammer	Pcs	5	Ditto	Ditto
6	Galvanised binding wire	Roll	2	Ditto	Ditto
7	Pliers	Pcs	5	Ditto	Ditto
8	Gabion Basket	Pcs	5	Ditto	Ditto
9	Raised Access Road at Eldoro Primary School	Set	1	Ndiuresh-Lumi (Lotikaboi) SRO	25 April 2014
10	Raised Evacuation Space at Eldoro Primary School	Set	1	Ditto	Ditto
11	Raised 2 Compartment Toilets at Eldoro Primary School	Set	1	Ditto	Ditto
12	Culvert at Eldoro Primary School	Set	1	Ditto	Ditto
13	Jembe	Pcs	5	Ditto	Ditto
14	Fork Jembe	Pcs	5	Ditto	Ditto

15	Mattock	Pcs	5	Ditto	Ditto
16	Pick Axe	Pcs	5	Ditto	Ditto
17	Spade	Pcs	5	Ditto	Ditto
18	Wheel Barrow	Pcs	5	Ditto	Ditto
19	Wooden Bar	Pcs	2	Ditto	Ditto
20	Claw Hammer	Pcs	3	Ditto	Ditto
21	Sledge Hammer	Pcs	2	Ditto	Ditto
22	Craw Bars	Pcs	2	Ditto	Ditto
23	Panga	Pcs	5	Ditto	Ditto
24	File sharpeners	Pcs	2	Ditto	Ditto
25	Slashers	Pcs	5	Ditto	Ditto
26	Plastic Can(20 Litres)	Pcs	5	Ditto	Ditto
27	Rope (1 Coil)	Coil	2	Ditto	Ditto
28	Nails	Pcs	2	Ditto	Ditto
29	Cotton Rope(1 Coil)	Coil	2	Ditto	Ditto
30	Triangle	Pcs	1	Ditto	Ditto
31	Spirit Level	Pcs	1	Ditto	Ditto
32	Compactor	Pcs	5	Ditto	Ditto

Mr. Hideki Sawa
Team Leader
JICA Project Team

Eng. John P. Oluoch
Chief Executive Officer
WATER RESOURCES
MANAGEMENT AUTHORITY
25 April 2014
Water Resources Management Authority, Republic Of Kenya

Certificate of Handover from Project Team to WRMA

6.5.5 Default Inspection

Date：25th of June 2014
Site：Eldoro Primary School
Participant：WRMA、Lower Lumi WRUA、Eldoro Primary School SMC, Contractor, Project Team

Contents and results：There are no damage and no need to maintenance in the results of the default inspection. WRUA monitoring sub-committee member was also known about default inspection.

Table 6.5-1 Result of Default Inspection

Object	Current status	Necessary maintenance
Evacuation Place	No damage	None
Raised Toilet	No damage	None
Culvert	No damage	None

	
Façade of evacuation place Date：25th of June 2014	Evacuation place for temporary classroom Date：25th of June 2014
	
Outside of raised toilet Date：25th of June 2014	Inside of raised toilet Date：25th of June 2014
	
Culvert Date：25th of June 2014	Sharing of default inspection results participant Date ：25th of June 2014

6.6 Monitoring and evaluation after completion of Environment improvement of evacuation place

6.6.1 Monitoring results of structure

(1) Culvert

After completion, the area has not experienced heavy rains nor is the flood that could lead to the region to be covered with water caused. Though due to the rainy season that usually causes damage to occur with the water flowing into school site. However, there is a testimony received from school that the rain water had not flowed into the school site

because of the culvert that was constructed. The community members residing near the school excavated the new drainage channel that is connected to the culvert and makes it easy for rain water to drain easily. There were no clogging and therefore the necessity for maintenance was yet to be felt.

	
Water flows on the other side channel of school Date : 25th of June 2014	Water flows little on the school side channel Date : 25th of June 2014

(2) Evacuation Hall

Evacuation hall is the place designated for evacuees as rescue centre during floods. The hall is yet to perform its functionality yet because the flood damage due to the flood have not been experienced in the recent rainy season. However, gratitude has been expressed by the school because; the school can use the facility as the temporary classroom during the construction of other classrooms.

(3) Raised Toilet

Raised Toilet has not been demonstrated yet because there have not been any serious flood damage. Normally it is used by the school teachers and the parents.

(4) Raised road

Though raised road does not get flooded but residents near the school relatives have pointed out that it had enhanced accessibility in the school wherein people could move comfortably without muddy road that characterize the area during normal rain, and it will function effectively at present.

Sand bag laid to the slope at both ends is seen in parts, and the part is worn out. The cause for that is that the soil used to cover the slopes is a little, it is necessary therefore to add more soil to cover the slopes and in addition thorough tamping should be done. Therefore in the future this kind of situation should be handled careful. It is worthwhile to note that the raised road was not subject to default inspection because it was constructed by WRUA and manpower from the community and not the contractor.

	
Sand bag in the slope at both ends is cropped out. Date : 25th of June 2014	Delivery of Certificate of Do-nou method Date：25th of June 2014

6.6.2 Consideration of the effect

Water Executive for Taita-Taveta County attended the pre-completion ceremony held on 11th of March 2014 and promised that a similar evacuation camp were going to be expanded to other primary schools in the region in future. Chief Water Officer for Taita Taveta County also participated in the flood management forum that was held in Taveta on 24th to 25th of June 2014 and stated that the will also expand these measures.

The completion certificate was issued from CORE that indicates that they participated in the training for raised road by Do-nou method. There is an effect for receiving such certificate on small–scale road maintenance that is acknowledged by road ministry which now makes it possible for them to participate in road maintenance. The school SMC chairperson's explanation seemed to point out that there was a possibility for them to be asked to expand such activity of raised road to other places in the county by the Taita Taveta County government.

	
Water Executive of Taita-Taveta County Date：11th of March 2014	Chief Water Officer of Taita-Taveta County Date：24th of June 2014

Chapter 7 Pilot Project at the Lower Gucha Migori Sub- Catchment

7.1 Support for establishment of the WRUA Flood Management Sub-Committee

The establishment of the "Management committee" and following three sub-committee under the "Management committee", is regulated to operate the activity of WRUA under the WDC (WRUA Development Cycle) manual.

- Finance sub-committee
- Procurement sub-committee
- Monitoring sub-committee

Under this Project, the Project Team considered that the flood damage in LOGUMI WRUA area was immense, and therefore supported the establishment of Flood Management sub-committee to enhance flood management in the sub-catchment through WRUA.

Flood Management sub-committee therefore endeavors to establish CFMO (Community driven Flood Management Organization) which operates under the LOGUMI WRUA.

CFMO is an organization that is established as CBO (Community Based Organization). CBOs emerge for purposes of solving community problems at community level. Therefore CFMOs aim at solving flood problems at community level through Community-driven Flood Management. All CBOs are registered under social service division of Ministry of Gender, Children & Social service and therefore CFMOs also are registered under this department.

7.2 Support of Establishment of CFMO (Community driven Flood Management Organization under WRUA (Water Resources User Association)

In the "Nyando Project", CFMOs were established at the village level, and CFMOs were synonymous with the organizations of CBO (Community Based Organization) which is not a new phenomenon in Kenya but are established in all parts of the country and aims at improving the various community issues and access various avenue for funding but there no organization that is established specifically for funding CBOs. Therefore in the Nyando the activities of the CBOs were established and the name CBO was changed to CFMOs and therefore CFMOs structure and their activities revolved around Flood Management.

Under this Project CFMOs are established under the WRUA. In this regard of establishing CFMOs under WRUA (WRUAs are able to access WSTF and WRUAs also work closely with WRMA) which operates through the fund of WSTF (Water Service Trust Fund) and other resources and therefore CFMOs are able to access such resources through the WRUA and therefore countermeasures against flooding in the community are easily achievable. CFMOs coverage area is smaller than WRUA and therefore the countermeasures at this level are also smaller than the WRUA and with the supervision of the WRUA CFMOs are able to implement community driven flood management activities.

7.2.1 Background of CFMO Promotion Support

The Project Team organized an Excursion Visit to Nyando herein referred to as "Exchange Visit" in March 2013 wherein the WRUAs in the three pilots' project areas were able to visit

Nyando river basin for purposes of observing the flood management activities undertaken under the Nyando Project and exchange opinions with community members in the Nyando.

LOGUMI WRUA identified the CFMO through the Exchange Visit, and established CFMOs in their sub-catchment on trial basis and all CFMOs were established under WRUA. The activities of CFMO are being operated still now.

CFMO established under WRUA (Water Resources Users Association) and WRUA is a community based organization at grassroots that works closely with WRMA (Water Resources Management Authority) at the sub-catchment level and WRMA is the lead agency in Water Resources Management in Kenya and falls under the Ministry of Environment Water and Natural Resources. The advantages for having established CFMOs under WRUA are as follows:

-WSTF fund can be utilized for the activities.

-Individual and specific flood management can be operated at respective communities governed by WRUA.

LOGUMI WRUA Flood Management Sub-committee has prioritized working with the CFMOs established under LOGUMI WRUA in flood management. CBO certificates are obtained at the social service division of Ministry of Gender, Children & Social Service which has guidelines on applying for establishment and compositions. CFMO therefore based on their activities can solicit for funds from other organization and not only from WSTF through WRUA.

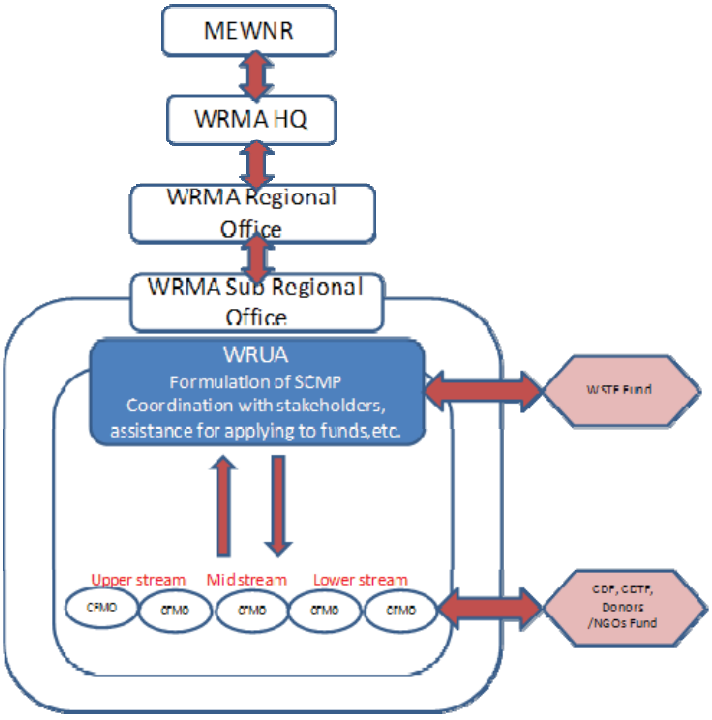


Fig 7.2-1 Classification and Activity System of CFMO under WRUA

In the flood management activities of CFMO, it is noted that the CFMO officials are from the affected area and therefore they are close to the community members that are affected by floods and therefore through the CFMO's activities within the community plays important roles in enhancing the community's resilience against the flooding within their respective community. Some of the CFMOs role include enhancement of rescue operations during flooding, smooth evacuation to reduce damage and flood forecasting and putting up of the necessary community-driven countermeasures. Information sharing on experience and

countermeasure in the past flooding is being promoted in the community as well. Construction of small scale of structure against flooding and refurbishment of the structures damaged by flooding, are also carried out by the community. Specific activities of CFMO are as shown below.

Table 7.2-1 CFMO's Activities

No.	Role	Photo	Remarks
1	Safety ability enhancement		Demonstration of rescue, etc.
2	Refuge training		Enhancement of disaster prevention consciousness
3	Life improvement through skill-acquisition for flood management		Improvement of technique for forecast and countermeasure

4	Knowledge improvement by information share on flooding experience		Improvement of disaster prevention consciousness and effective learning
5	Provision of sign board		Showing inundation depth and evacuation route in the inundated area (under preparation at LOGUMI WRUA now)
6	Maintenance of structure provided for flooding countermeasure		Repair of damaged culvert and gabion

Following advantages and issues have been revealed in the CFMO's activities at LOGUMI WRUA.

Table 7.2-2 Advantageous Activities of CFMO

No.	Advantage	Remarks
1	Likely to be supported to the local community By such developing partner as administrative organization, non-governmental organization and donor	Similar organization to CBO
2	Composed by voluntary and positive members	Having strong mind in local consciousness by nature
3	Having strong consciousness of the activities as the persons concerned	

No.	Advantage	Remarks
4	Possible to become contact between donor and community member	Having dual viewpoint as inhabitant and as developer
5	Likely to mobilize the persons easily due to old acquaintance with community members	
6	Familiar with local topography and geography and having protective mind toward the community members with knowledge of dangerous spots when flooding	
7	Appropriate for communication and information exchange with neighboring villages	Habitual local interchange and similar language

Table 7.2-3 Issue in CFMO

No.	Issue	Remarks
1	Much dependence on the chairman's leadership for operation, thus, likely to be declined in case of chairman's shift	
2	Possibly to become private organization by the persons who established CFMO	Making such warehouse for flood management personal belonging
3	No supervisory organization	Required for high moral and self-purification of the personnel
4	Unrestricted performance due to no definite obligations to WRUA	Limited control of WRUA

As explained above, CFMO have good rapport with the community members and are likely to proceed with positive and detailed performance in consideration of high consciousness and independence of its activities. Whereas, due to its leanness and specific to a particular community there is a possibility that the influential opinion leaders can take up leadership and operate the CFMO as private organization in terms of operational function and authority.

7.2.2 Establishment of CFMO to Other WRUA

Since CFMO area of operation in flood management is smaller community unit than WRUA, it is easy therefore to target priority issue and assign the personal resource for carrying out the accident prevention activities in the community.

From the above viewpoint, the Project Team supported the establishment of CFMO in the Lower Lumi WRUA that aimed at establishing CFMOs in flood prone areas within Lower Lumi WRUA jurisdiction. The processes towards establishment of CFMOs were as follows:

(1) Orientation to Lower Lumi WRUA and School Persons and sharing of Opinions:

The Project Team explained the CFMO structure and circumstances as engaged in LOGUMI WRUA to Lower Lumi WRUA. The advantageous elements and issues of CFMOs were also discussed and opinions were shared on the possibility of establishment CFMO.

(2) Orientation at IFMC (Integrated Flood Management Committee)

The Project Team also explained the guidelines of CFMO, its establishment and operating circumstances as experienced by LOGUMI WRUA and the advantages and disadvantages were also discussed.

There were concerns that were raised specifically on capacity development of the CFMO leaders as per the experiences of the Nyando Project case. In the Nyando the Nyando project team supported the CFMOs in Nyando Project and during the project period the CFMOs were operated efficiently because the Nyando project team were able to advice and instruct the CFMO however, it was noted that after the Nyando project the CFMO quickly declined in efficiency due to shortage of funds. In a particular case where the head teacher that cooperated with Nyando project and CFMO was transferred of the CFMO leadership lack of responsibility that led to poor maintenance of the structures constructed under Nyando project.

It is therefore requisite for CFMO to have leaders that are proactive and efficient and operate under the WRUA that will enable the CFMO to even function whether there is a donor or not to enhance sustainability of the CFMO.

Head Teacher of Eldoro Primary School pointed out that the local educational organization would be involved in the promotion of the vanguard community organization that aims at flood management.

7.2.3 Activities Being Taken for Capacity-Building Necessary for Establishment of CFMO

LOGUMI WRUA has requested for financial support from other donors and county government. As for Nyando River Basin, existing CBO have received funding. Such fund disbursement are often reported in the media example of such media report on funding is shown in the figure 7.2-2 below.


theSTAR

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YOU ARE HERE: HOME » NYANDO CBO'S GET SH267M FOR WETLANDS

Nyando CBO's get Sh267m for wetlands.

The government and the World Bank yesterday disbursed over Sh267 million to 82 community based organisations in Nyando.The grant is meant to strengthen the capacity of the organisations in restoring and improving catchment along Nyando River.

The under-secretary at the Ministry of Environment Alice Kaudia, asked the organisations to take environmental conservation seriously.The projects to be initiated with the funds include wet land management, tree planting, forestry, and fish farming.

Other lake shore districts that will benefit from such grants are Homa bay, Bondo, Nyatike, Rachuonyo and Rarieda.

Source: http//www.the-star.co.ke/news/article-113706/nyando-cbos-get-sh267m-wetlamds

Fig 7.2-2 News of Fund Disbursement of Nyando CBO

It is herein noted therefore that there is a possibility to realize the establishment of CFMO and its operation in Lower Lumi WRUA as is the case in LOGUMI WRUA. It is imperative to note also that the fund for road construction using sand bags in Lower Lumi from the Taita Taveta county government can easily be realized and engage the CFMO in preparation of the financial proposal towards that activity.

As mentioned hereinabove, CFMO can be established through making an application to Social Service Division of Ministry of Gender, Children & Social Service and thereafter obtain certification as CBO and thereafter establish its own bank account.

Lower Lumi WRUA through close working relationship with LOGUMI WRUA therefore intends to implement the establishment of the CFMO within its sub-catchment. Membership composition of CFMO will be of about 30 persons that will put in consideration of gender, age, professionals and advisor comprising of administrative organization in the sub-county level.

7.3 Assistance for construction of raised toilet from World vision fund

After heavy floods in Lower Gucha Migori sub-catchment in 2013, there were plans to construct toilets in four primary schools in flood prone areas, by World Vision. From the Exchange Visit Lower Gucha Migori (LOGUMI) WRUA had a glimpse of raised building for facilities in flood prone areas as was implemented in the Nyando. Therefore based on their observation of the Nyando Project LOGUMI WRUA influenced change of the design of the toilets from the normal flat and not raised toilet to the raised above flood depth design kind of toilet. This is one good example of studying from other areas cases that lead to attitude change and not just listening to rumours. The Project Team considers this is as a well-represented case of the Nyando project being replicated in other areas.

Fig 7.3-1 Raised Toilet constructed with assistance from World Vision (Lower Gucha Migori WRUA)

7.4 Assistance for guarantee of activity budget in Lower Gucha Migori sub-catchment

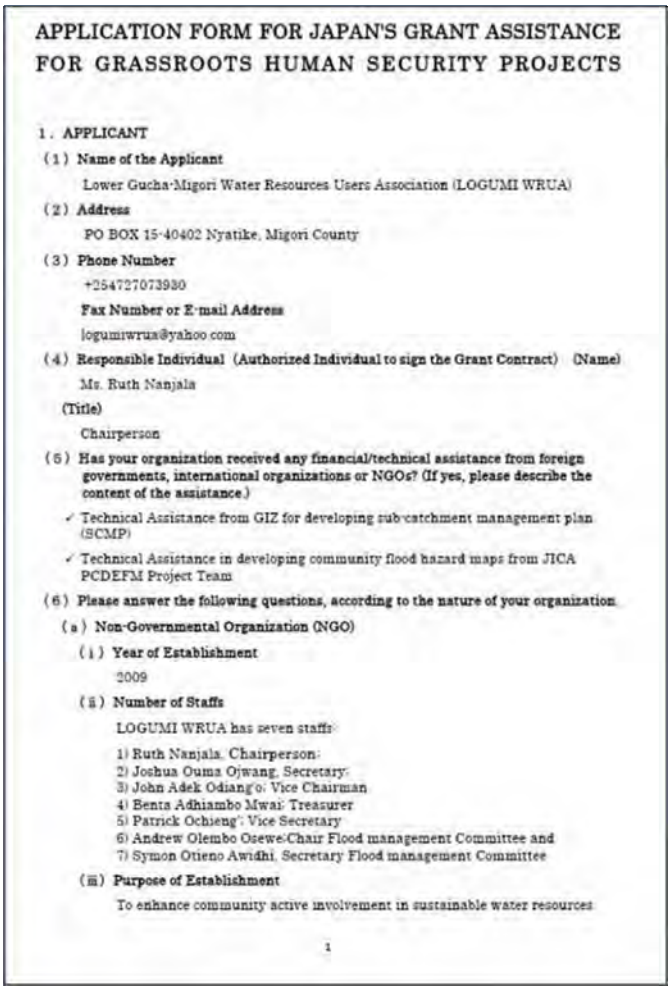
LOGUMI WRUA is considering schools as one of the evacuation centres , and is exploring the preparation for functional capacity. In this matter, the project team promoted to obtain the grant aid for grass-roots groups provided by Japan government besides to WSTF funds for applying to flood measures by including the flood matters into SCMP.

First of all, the project team supervised WRUA to obtain the memorandum for offering, and then explained the contents and application condition etc. to the secretary of WRUA. Then application procedure is ongoing by exchanging and correcting the draft application documents each other. Application contents are consisting of raising the foundation of evacuation centres based on the modified design of Nyando sub-catchment case in order to be suitable to the Lower Gucha Migori sub-catchment situation.

On the other hand, the construction method for raising foundation of toilet applied in Nyando that was introduced by the activity of this project was proposed from Lower Gucha Migori

WRUA, currently that was already completed.

For the activity for acquisition of budget, relevant information or lessons learnt shall be shared as common scheme. Through the scheme like this, other WRUA will be able to obtain the budgets, and it expected the expansion to other many areas.



APPLICATION FORM FOR JAPAN'S GRANT ASSISTANCE
FOR GRASSROOTS HUMAN SECURITY PROJECTS

1. APPLICANT

(1) Name of the Applicant

Lower Gucha-Migori Water Resources Users Association (LOGUMI WRUA)

(2) Address

PO BOX 15-40402 Nyatike, Migori County

(3) Phone Number

+254727073930

Fax Number or E-mail Address

logumiwrua@yahoo.com

(4) Responsible Individual (Authorized Individual to sign the Grant Contract) (Name)

Ms. Ruth Nanjala

(Title)

Chairperson

(5) Has your organization received any financial/technical assistance from foreign governments, international organizations or NGOs? (If yes, please describe the content of the assistance.)

✓ Technical Assistance from GIZ for developing sub-catchment management plan (SCMP)

✓ Technical Assistance in developing community flood hazard maps from JICA PCDEFM Project Team

(6) Please answer the following questions, according to the nature of your organization.

(a) Non-Governmental Organization (NGO)

(i) Year of Establishment

2009

(ii) Number of Staffs

LOGUMI WRUA has seven staffs:

1) Ruth Nanjala, Chairperson;
2) Joshua Ouma Ojwang, Secretary;
3) John Adek Odiang'o; Vice Chairman
4) Benta Adhiambo Mwai; Treasurer
5) Patrick Ochieng'; Vice Secretary
6) Andrew Olembo Osewe-Chair Flood management Committee and
7) Symon Otieno Awidhi, Secretary Flood management Committee

(iii) Purpose of Establishment

To enhance community active involvement in sustainable water resources

1

Fig. 7.4-1 The application form submitted to Japan embassy from LOGUMI WRUA

7.5 Implementation support of community disaster prevention activity

7.5.1 Excursion visit to Nyando and Exchange visit to LOGUMI SC

Nyando river basin site visit and Lower Gucha Migori sub-catchment visit by each WRUA members from Isiolo, Lower Lumi and Lower Gucha Migori (LOGUMI) were emphatically implemented. Other participants to the above mentioned visits were JICA Project Team, WRMA HQ, RO and SRO (from all the three pilot areas) and GIZ. The table 7.4-1 below shows the date and schedules for the visits.

Detailed explanations of these activities are shown in Appendix 3-24.

- Nyando district on-site visit：Sun. Mar. 24, 2013～Tue. Mar. 26
- Lower Gucha Migori WRUA visit：Wed. Mar. 27, 2013～Fri. Mar. 29

Table 7.5-1 Visitation, Mutual visit schedule, and visitation target, etc.

Place	Activity	Time	
		Arrival (Start)	Departure (End)
24/03/ 2013 Sunday			
Kisumu	WRUAs to move from their places to Kisumu by a chartered car(mini bus) Stay in **Kisumu**	8:00(Lumi and Isiolo) 14:00(LOGUMI)	17:00
25/03/ 2013 Monday			
WRMA SRO Kisumu	Orientation meeting at WRMA SRO	09:30	10:00
Mowlem village	Meet with Rae Primary School management observe the borehole and evacuation centre	10:45	12:05
Rae Village	Observe the small culverts constructed in Rae village	12:15	12:30
Kamuga Village	Meet with Kamuga CFMO and school teachers and observe lesson on flood education programme and observe structures in the schools	12:45	14:05
Ahero	Lunch	14:35	16:00
Kokwaro village	Observe raised road and evacuation centre at Kokwaro constructed under the master plan (30 min)	16:45	17:55
Vunduba Hotel	Dinner	19:45	21:15
Vunduba Hall	Projection of Evacuation Drill Video for participants to observe	21:25	22:15
26/03/ 2013 Tuesday			
Kamagaga village	Observe the evacuation centre, flood hazard map signboard, small directional signboard and footbridge	10:30	11:45
Achuodho village	Presentation and discussion in the evacuation centre	12:30	14:30
Ahero	Lunch	15:00	16:00
On road traveling to Lower Gucha Migori 3 hours drive Participants except LOGUMI WRUA to stay in **Kisii**		16:30	19:00
27/03/ 2013 Wednesday			
LOGUMI WRUA Office at Wath Onger	Explanation of community based flood observation and early warning system by LOGUMI WRUA	11:00	12:00
ditto	Explanation of community based flood hazard mapping by Mr. Joshua, Secretary of LOGUMI WRUA and Mr. Boit, WRMA LVS RO	12:00	13:00
Kabuto and Nyora village	Observation of flood affected areas	13:15	15:45
LOGUMI WRUA Office at Wathonger	Lunch	16:00	17:00
	Move to Kisii	16:00	18:00
	Stay in Kisii		
28/03/ 2013 Thursday			
Gucha Migori River at Wathonger	Explanation of flood water discharge observation by using ADCP and demonstration of flood water discharge observation by using ADCP by WRMA LVS RO	09:45	11:15
LOGUMI WRUA Office at Wathonger	Explanation and discussion on ADCP by Eng. Thooko	11:20	11:50
LOGUMI WRUA Office at Wathonger	Plenary discussion on the Nyando and LOGUMI Visit (good practices) moderated by Prof. Onyando	11:50	12:50
LOGUMI WRUA Office at Wathonger	Lunch	13:00	14:00
Move to Kisii		15:30	17:00
Stay in Kisii			
29/03/ 2013 Friday			
On road traveling from Kisii to Nairobi		07:30	14:00
On road traveling from Kisii to Taveta		07:30	18:00
On road traveling from Kisii to Isiolo		07:30	18:00

7.5.2 Activities during Excursion visit to Nyando and LOGUMI SC

1. Major findings in Nyando River Basin

i. The Nyando River Basin is heavily affected by floods that adversely affect the community that live within the basin. The Nyando Project on flood management has led to reduced human suffering and casualty during floods as a result of both structural and non-structural measures that have been undertaken in the basin;

ii. The education programme on Flood Management is still being undertaken in some of the school where the Nyando Project was undertaken that has led to high level of sensitization on flood management among pupils in school;

iii. The raised toilets, evacuations centre and borehole plays an important role in the area because they enable communities to access these structures in spite of the floods in the area. There are community members who have raised the foundations of their toilets in their homes as modeled by toilets constructed in the Nyando Project;

iv. Community members through the CFMOs are operating and maintaining the various structures constructed within the Nyando basin;

v. The CFMO members in most areas still have dependence mentality and this is due to their reluctance in joining WRUAs that will enable the CFMOs to access funds through the WRUA to implement the various CAPs items that they developed. The CFMOs still depend on the external help rather than reach out and release the enormous potential that is within the basin including joining the WRUA; and

vi. There are gaps that need to be abridged between WRUA and CFMOs. WRMA is yet to make a follow up in strengthening the communities under the Nyando Project and this can be attributed to the Nyando Project Implementation strategy wherein the Project entry point was CFMO rather than WRUAs wherein WRMA is able to interact with directly. One of the way forward as per the discussion was to eliminated the gaps, whereby WRMA-LVSC Kisumu Sub-regional Office indicated that they will make a follow up, harmonize the activities of the CFMOs and the WRUAs and ensure that the CFMOs join the respective WRUA and work together as a team.

2. Lower Gucha Migori Sub-catchment

i. The LOGUMI WRUA are actively involved in flood management in the sub-catchment and they have established a flood management committee that is charged with flood management within the WRUA;

ii. The LOGUMI WRUA have a well established communication channels within the various committees within the LOGUMI WRUA that enables them to effectively develop various tools for example the early warning hydrograph; and

iii. The LOGUMI WRUA members are sensitized on the issue of flood management and this has led for the WRUA to develop three flood hazard maps within the sub-catchment;

7.5.3 Summary of the Excursion visit to Nyando and LOGUMI SC

Meetings were held and discussion points were flood management programme in school, flood management activities by the CFMO and interaction between WRUAs in Nyando and CFMOs among other salient issues that were discussed. Participants during the discussions included school community, resident of the area and CFMO members. It was noted that despite the Nyando Project the floods still occurred in the Nyando.

Flood countermeasures constructed under the Nyando Project were visited such as evacuation centers, raised borehole, culvert and raised road. The participants also witnessed flood

education program concerning flood in schools, Flood Hazard map sign board, and evacuation drill videos among other activities.

During the site visit to LOGUMI sub-catchment, flood damaged sites were visited and the participants received explanation on flood observation in community, improvement of early-warning system, making hazard map and observation method of high flows during flood using ADCP.

Chapter 8 Supporting Community based flood early warning system

In this chapter, implemented activities defined in PDM are explained as following:

2-6) WG assists the implementation of community based disaster prevention activities based on flood management plan
2-7) WG monitor and evaluate the community based disaster prevention activities
2-9) WG establish the activity manual and collection of examples and lessons learnt

The Project Team implemented the workshop for assembling and installation of rain gauges and water level gauges as an introduction approach of simplified FEWS - Flood Early Warning System – by community. And then, the project team installed the gauges in 3 river basins with community cooperation.

Before the end of this Project, the Project Team held the forum which focused on the FEWS as main theme. In the forum, the explanations of the approach concerning FEWS from each WRUA and the future plan for FEWS expansion nationwide were done. And also, discussion on these topics was done.

The Project Team made the instruction manuals for manufacturing, installation, maintenance and warning operation, and then distributed the manuals to relevant members when the forum was held.

8.1 Implementation of workshop for manufacturing simplified rain gauges and water level gauges

The workshop for manufacturing workshop was held at KeWI - Kenya Water Institute and it was a course for two days from 16th Oct. to 17th, 2013. The implementation program is shown in the table8.1-1.

On manufacturing, this Project invited the members from Isiolo WRUA, Lower Lumi WRUA, Lower Gucha Migori WRUA and each WRMA SRM from the pilot project area. The JICA short-term expert led the implementation of the actual manufacturing in the course of material procurement to electronic assembling and the trainee traced the manufacturing works.

And also, in order to be able to manufacture and maintain the gauging equipment continuously by the participants of the workshop, the Project Team distributed the instruction manuals for manufacturing, maintenance and operation for observation, and formulated an efficient structure of implementation.

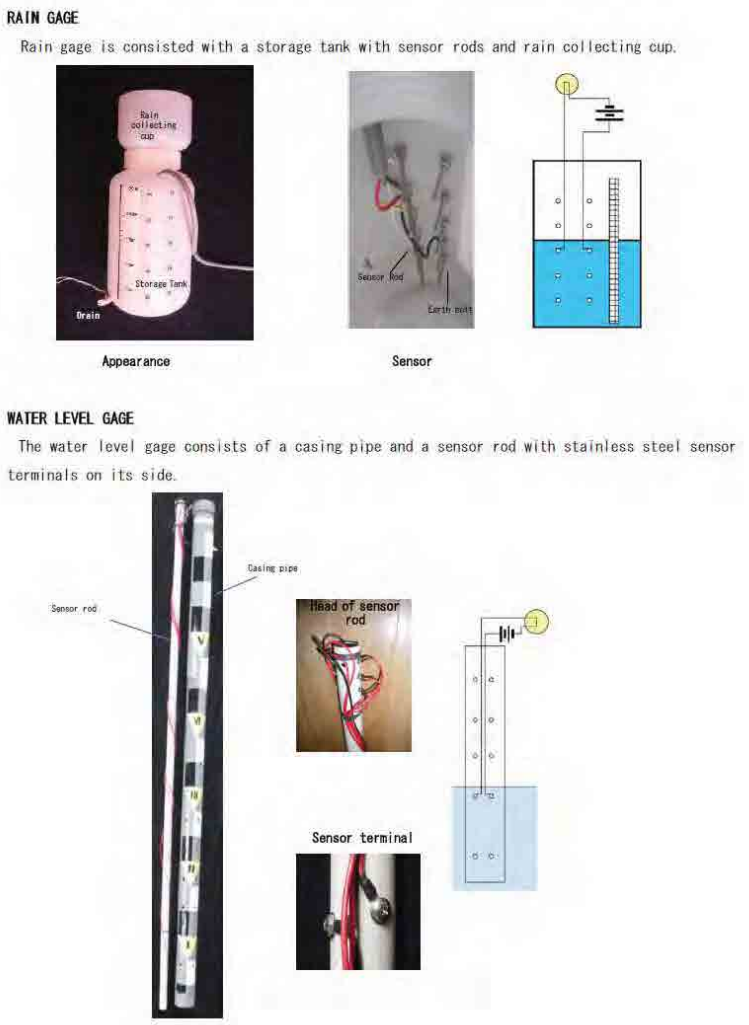
Table 8.1-1 The program on FEWS manufacturing work shop

WRMA Training 1st Stage						Workshop and Installation of Community-Based Flood Early Warning (CBFEW)	
Day	Time (hr)	Theme	Session	Lecturer	Venue	Theme	Lecturer
16/Oct (Wed) *)	1.0	2.Rainfall and Flood Observation/ 4.Community-based Flood Hazard Mapping	2-1) Rainfall observation	Eng. Sawa	KeWI	Workshop on manufacture of CBFEW	Mr. Omachi <Mr. Ooi to arrive at Nairobi >
	1.0		2-2) Discharge observation	Eng. Sawa	KeWI		
	1.0		4-1) Capacity of transmitting and communication skills	Mr. Clement	KeWI		
	1.0		4-3) Public awareness raising on floods	Mr. Clement	KeWI		
	1.0		4-4) Roles of effective communication channels between government and community in mitigating a flood risk	Mr. Clement	KeWI		
17/Oct (Thu) *)	1.0	5.Flood Early Warning (introduction)	5-1) Flood Early Warning System (FEWS)	PROJECT TEAM member	KeWI	Workshop on manufacture of CBFEW	Mr. Omachi
	1.0		5-2) Introduction to Integrated Flood Analysis System (IFAS) and Global Flood Alert System (GFAS)	Eng. Kimanga/ Eng. Mwangi	KeWI		
	2.0		5-3) Community-based Flood Early Warning	Mr. Ooi	KeWI		
	2.0	8. Flood Disaster Evacuation Programme	8-1) Evacuation planning	Mr. Ooi	KeWI		

Source: An extract from 1st stage WRMA training course program

Photo 8.1-1 FEWS manufacturing workshop

The explanation figures for simplified rain gauges and water level gauges are shown below.



Source: Simple Water level/Rainfall Monitoring & Warning System
Water-level/Rainfall Gage for Community Early Warning INSTRUCTION MANUAL

Fig. 8.1-1 The explanation figures for simplified rain gauges and water level gauges

8.2 Introduction of Community Based FEWS and the operation results

As a result of the workshop for simplified rain gauges and water level gauges, determination of exact point of installation and actual installation was done in Isiolo river basin and Lumi river basin under the instruction by short term expert.

In Gucha Migori river basin, determination of exact point for installation and actual installation was done under the leadership of WRMA staff and WRUA members who attended the workshop.

The chairman of WRUA manage each observation materials, and then the employee or cleaning staffs of the school that has the FEWS facilities such as simplified rain gauges or water level gauges will observe by voluntary base.

Against the case of machine troubles, it will be ideal that the observers who confirmed troubles on the FEWS systems will inform the situation to WRUA and WRMA SRO. But currently, that structure is not established as a certain system in the present period.

This situation is reported on "CBFEWS" forum that will be mentioned later as a principle problem.

The installation outline and operation result of FEWS by using simplified rain gauges and water level gauges is shown below.

8.2.1 Isiolo river basin

In Isiolo river basin, site survey for determine the installation points of simplified rain gauges and water level gauges was done. For determination of installation points, some candidate points were suggested by WRUA or KRCS members living in relevant local areas, and then short term expert decide the installation points by doing the technical evaluation. According to the results of survey and evaluation, installation will be done in all candidate points.

Furthermore, one rain gauge had been previously installed at Nkando Primary School in February 2013, through this project, a simplified water level gauge was installed in 1 point, and simplified rain gauges are installed in 4 points in this river basin. The outline and location map are shown below.

Table 8.2-1 The outline of installation for simplified rain gauges and water level gauges in Isiolo river basin

Installed Item	Installation point	Situation
Water level gauge1	At Acacia River lodge (Isiolo WRUA Chairman's house) Altittude 1,474m	Installed (Feb. 2014)
Rain gauge1	Ntirimiti Secondary school（Altitude 2,516m）	Installed (Oct. 2013)
Rain gauge 2	Kibirichia Sub district hospital (Altitude 2,313m）	Installed (Oct. 2013)
Rain gauge 3	Juja Hill Academy（Altitude 2,020m）	Installed (Feb. 2014)
Rain gauge 4	Nkando primary school （ Altitude 1,538 m)	Installed (Feb. 2013

As the following figures show, the installation points are located in middle to upper stream of Isiolo river. And then, the target for flood early warning is the community of Isiolo town.

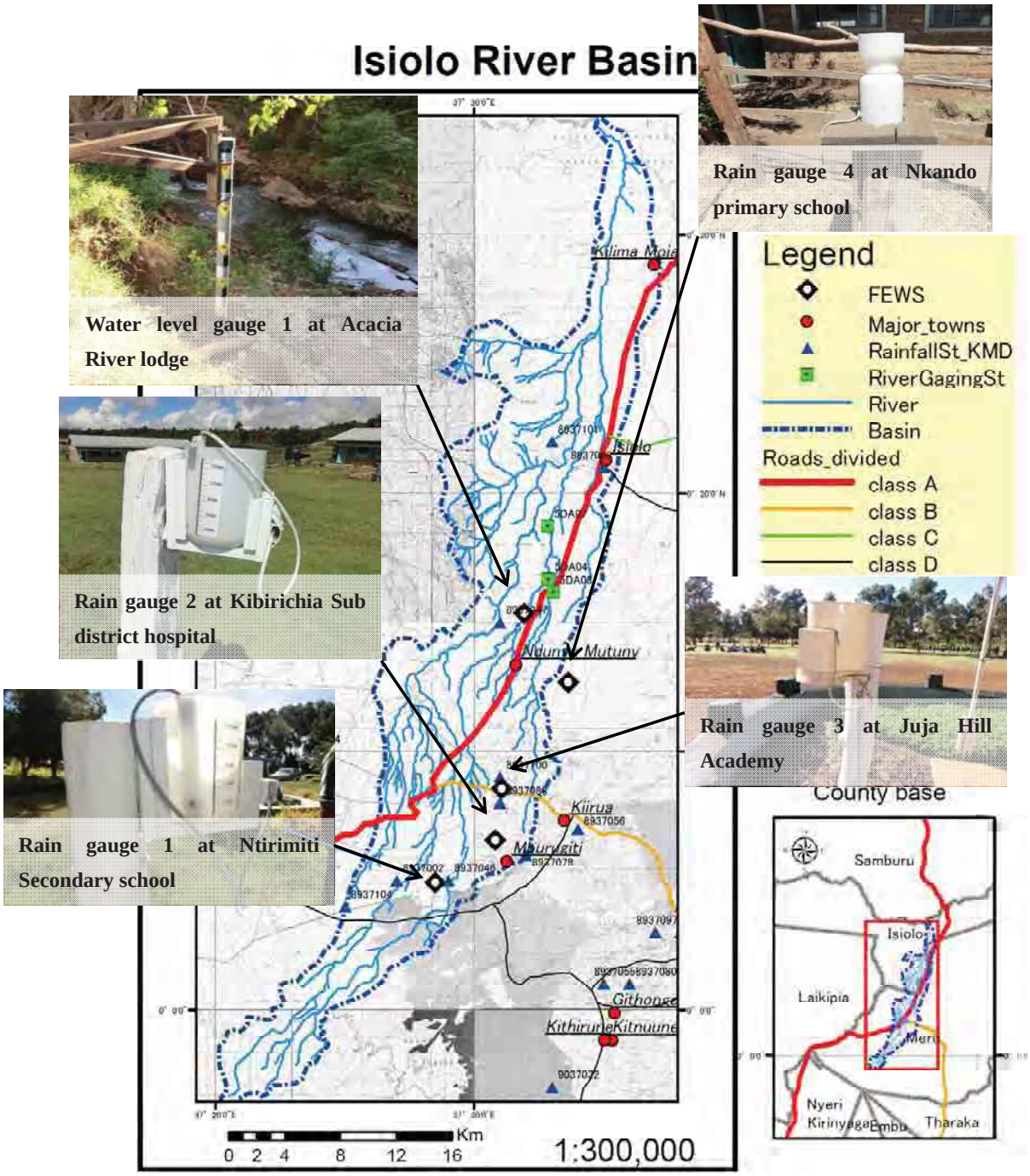


Fig. 8.2-1 Location map of simplified rain gauges and a water level gauge in Isiolo river basin

The flood warning structure in this river basin is shown below. The observer will inform to WRUA representative, WRMA-SRO, KRCS and local radio station. After that, each organization distributes the flood warning.

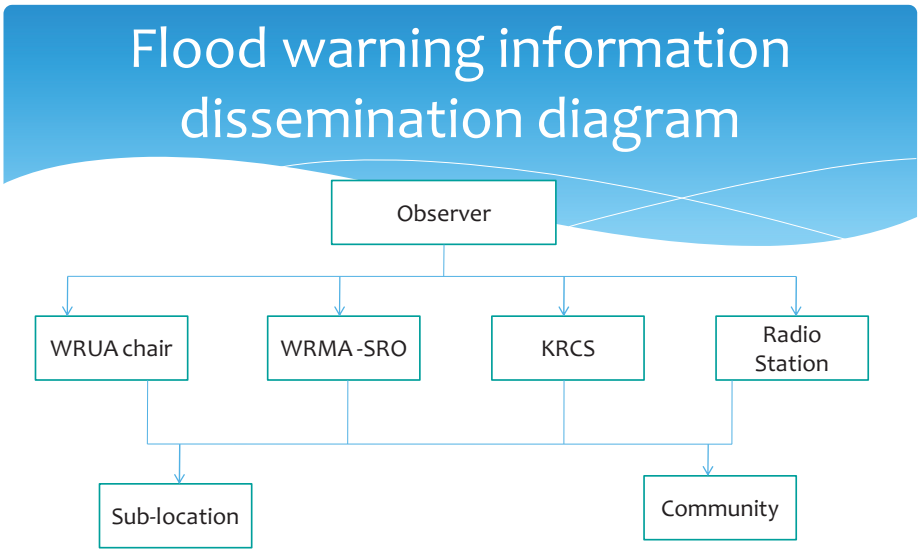


Fig. 8.2-2 FEWS information distribution structure in Isiolo river basin

A sensitized community and effective communication on early warnings system can avert flood crisis. In the evening of 29th March 2014 FMO in WRMA Isiolo SRO received information of heavy rain in the upstream and moved swiftly to alert downstream and walkers along Isiolo market road. They complied with appreciation to avoid damage or loss of property.

8.2.2 Lumi river basin

In Lumi river basin, the installation points were determined by evaluation of short term expert from the technical point of view.

Finally, based on this result, two rain gauges and one water level gauge were installed through this Project. The outline and location map of installation are shown below.

Table 8.2-2 The outline of installation for simplified rain gauges and water level gauge

Installed Item	Installation point	Situation
Water level gauge1	At 3 J15 WRMA RGS station Darajani, Taveta (Altitude 752.6 M)	Installed (Aug, 2013)
Rain gauge1	Rekeke Village, Volunteer's Homestead (Altitude 743.7 m)	Installed (Aug, 2013)
Rain gauge 2	Challa at homestead of Upper Lumi WRUA Chairman (Altitude 887.3m)	Installed (Aug, 2013)

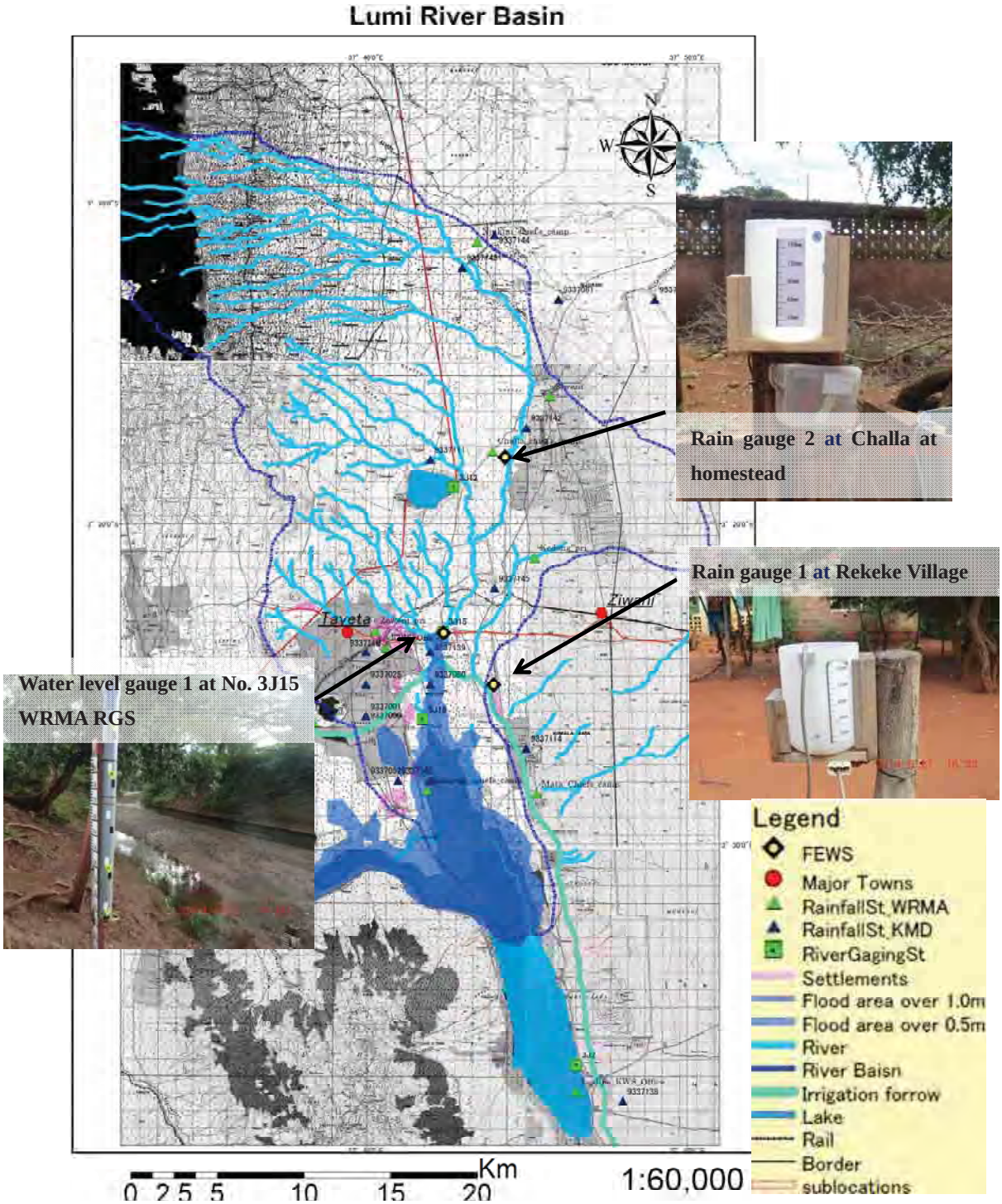


Fig. 8.2-3 Location map of simplified rain gauges and a water level gauge in Lumi river basin

As described in the above map, a simplified rainfall gauge is installed in the point near Lake Chala an area that belongs under jurisdiction of Upper Lumi sub-catchment. The other is installed at a point in Rekeke that belongs to Lower Lumi sub-catchment in each. A simplified water level gauge was installed at the same point where existing water level gauging station that is operated by WRMA.

The flood warning structure in this river basin is shown below. The observer will inform to

WRUA representative, WRMA, WRUA and Area Chief. After that, each organization issues the flood warning.

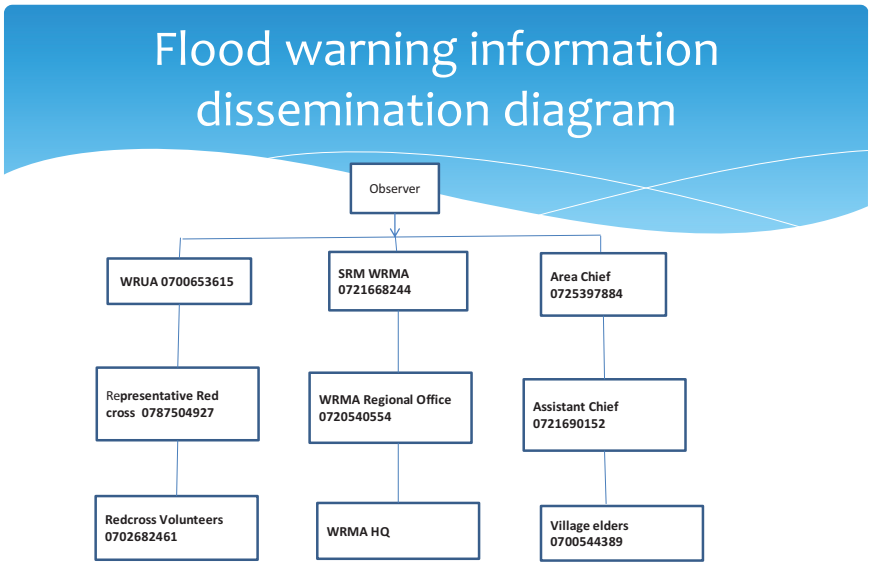


Fig. 8.2-4 FEWS information distribution structure in Lumi river basin

Actual operation results i.e. from Aug. 2013 to Jun. 2014, wherein seven (7) warnings were issued. And the flood damages occurred in Kimorigo and Eldoro on 8th, Dec., 2013.

Sample of Record of Rainfall and flood alert by observer

No.	Date (DD/MM/YYYY)	Observation time (HH:MM)	Rainfall (mm)	Reaction	Flood occurrence and situation
1	08/11/2013	19:42	30	Warning and communication through the network	
2		21:37	60	Warning and communication through the network	
3	09/11/2013	07:16	60	Warning and communication through the network	
4	02/12/2013	07:00	30	Warning and communication through the network	
5	07/12/2013	22:52	30	Warning and communication through the network	
6		23:50	60	Warning and communication through the network	
7	08/12/2013	00:36	90	Warning and communication through the network	Flooding and damage in downstream areas like Kimorigo and Eldoro

Fig. 8.2-5 The rain gauge observation and warning record in the Lumi river basin

8.2.3 Gucha Migori river basin

In Gucha Migori river basin, at the first, in downstream area, a simplified water level gauge was installed at Wath Onger at the same place where there is existing water level gauging station that belongs to WRMA. However, WRUA members and WRMA officers understood that it was late to start evacuation activities after getting information of water level rising at

Wath Onger station. Therefore, they decided to install rain gauges in the upstream.

Three (3) simplified rain gauges were installed in each upstream point with corroboration of two WRUAs -Middle Gucha WRUA、Upper Magor WRUA and school community (Iterio Girls High School). The effectiveness of the CBFEWS will be realized because there will be possibility to receive flood warning in advance compared to the previous case of just observation of water level gauge in downstream.

Thereafter, a simplified rain gauge was installed near Ongoche river.

Table 8.2-3 The outline of installation for simplified rain gauges and water level gauge in Gucha Migori river basin

Installed Item	Installation point	Longitude	Latitude	Altitude(m)	Situation
Water level gauge 1	Wath Onger in Nyatike Sub-County	34 12.6/'0"E	0 57/'0"S	1145.1	Installed (Dec 2013)
Rain gauge 1	Kiang'ong'i Secondary School in Gucha Sub-country	34 47.6/'0"E	0 46.4/'0"S	1891.6	Installed (May 2014)
Rain gauge 2	Emuria Dikiri Secondary School in Transmara Sub-county	35 6.08/'0"E	1 1.02/'0"S	1886.4	Installed (May 2014)
Rain gauge 3	Near Ongoche river, Kanga Onditi Primary School, Nyatike Sub-county	34 14.5/'0"E	1 4.19/'0"S	1302.4	Installed (June 2014)
Rain gauge 4	Iterio Girls Secondary, in Kerina Sub-county	34 43/'0"E	0 40.7/'0"S	1653.6	Installed (July 2014)

Photo 8.2-1 Installation of a rain gauge in Emuria Dikiri High School (Left side)
Installation of a rain gauge in St. Pancras Kiong'ongi High School(Right side)

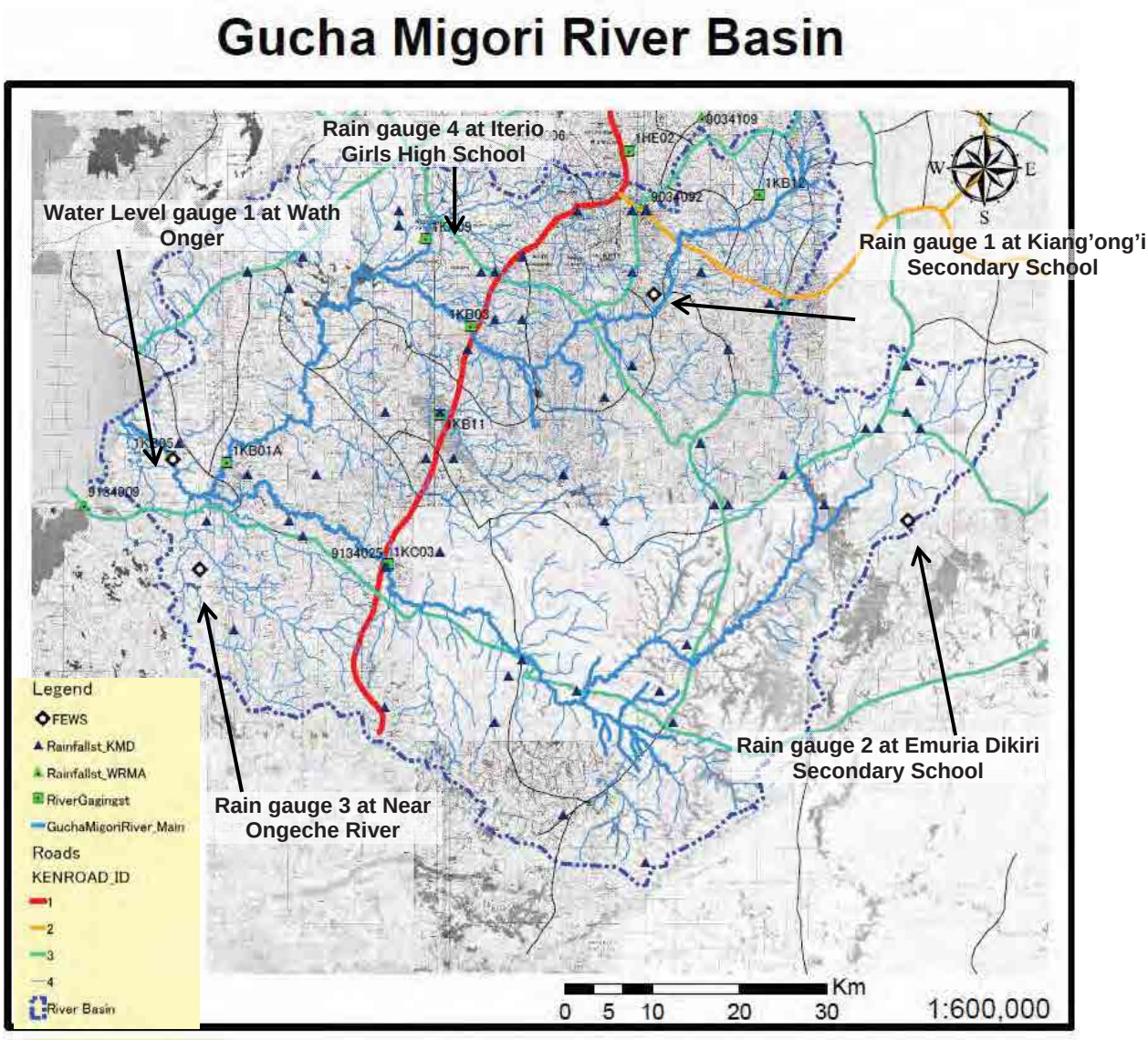


Fig. 8.2-6 The location map of simplified rain gauges and a water level gauge in Gucha Migori river basin

The contact system structure of the FEWS in Gucha Migori river basin is shown below. The each observer at upstream will inform the situation to LOGUMI WRUA at downstream in corroboration with WRMA.

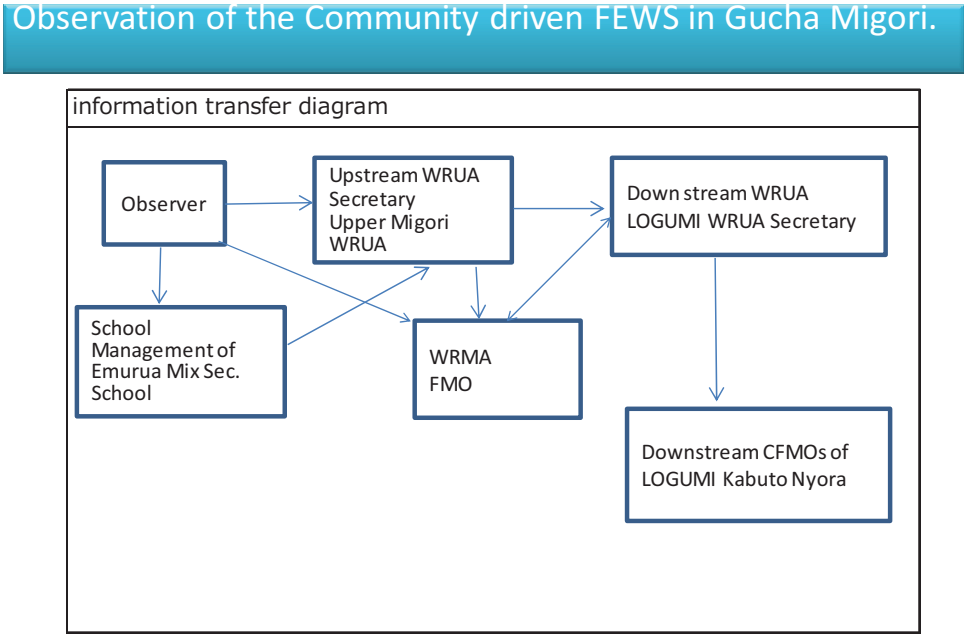


Fig. 8.2-7 The contact system structure of FEWS in Gucha Migori river basin

The problem of obtaining the actual time that the floods should occur in the downstream after the rain in the upstream was pointed out during the forum in Taveta.

The current situation, is that the prediction for the lead time of flood occurrence is yet to be established because this river basin is vast and there is lack of capacity on hydrological analysis. Therefore, that in the near future it will be important to understand the lead time from the onset of rain in the upstream and flood occurrence in the downstream.

8.3 Preparation on FEWS instruction manual

FEWS instruction manual was prepared by long-term expert, and consists of 3 parts as follows: 1) manufacturing, 2) installation & maintenance and 3) warning operation.

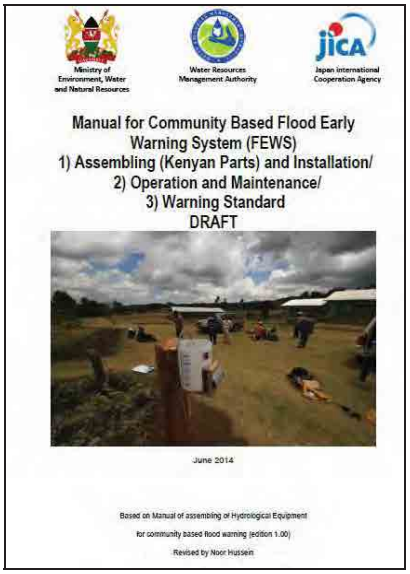


Fig. 8.3-1 Cover page of FEWS instruction manual

8.4 Holding community flood early warning system forum

The Project Team held the forum that main theme was FEWS on 24th to 25th, 2014 to summarize the activities of FEWS distribution. The reports of FEWS approach from WRUAs belong to each river basin and presentation and opinion exchange and site visiting were implemented.

The participants included WRMA staffs, WRUA members, member of Ministry of Interior and representative of County Governments. Total number of participants was approximately seventy (70). Main participant from each organization are shown below.

- WRMA : CEO, FMU members in Head Quarter, ATCM belong to 6 Regional

Offices(in charge of flood), Sub Regional Managers and Flood Management Officers belong to each pilot area, Flood Management Officers belong to 12 Sub-Regional Offices as nationwide target for flood management.

- WRUA : 3 WRUAs belong to pilot sub-catchments.
- Other organizations: Deputy Director of Disaster prevention ministry of interior
- County government : Representative from Taita Taveta county and Meru county
- Japan side : Members from JICA Kenya office, JICA project team

The item related to FEWS within the contents that were presented and discussed in the forum sessions are shown below. And also the minutes of FEWS forum etc. are shown in appendix 3-25.

(1) Opening address by WRMA CEO

- The flood management become now to a part of water resource management. And also the Integrated Flood Management is included to "WRMA strategic plan -2012-2017-". The concept of flood management is completely included to CMS.

- The new constitution define that a part of water resource management will be done by counties, but WRMA would like to do it by corroborating with counties.

(2) Opening address by representative of Taita Taveta County Government

The county government will implement the flood measures in this area with WRUA.

(3) Opening address by JICA long term expert

Counties will be important stakeholders in water resource management. WRMA is expected that can support the counties technically.

(4) Opinion exchange

The following opinions were discussed.

Organization	Opinions
Ministry of Interior	Kenyan people should change their attitude towards early warning information.
Isiolo WRUA	The improvement of communication system is necessary.
ATCM (FM) in WRMA HQ	WRMA should be an organization that can operate the "Technical Standard". Concerning the communication structure, establishment of the flood management committee and its use will be one of solution.
LOGUMI WRUA	It might be effective method such as horn or whistle for warning. If there is a long distance between the observation point and flooding area, it will be a problem. In such case, it will be effective that establishment of "CFMO" and information from "CFMO".
LOGUMI WRUA	The problem is that there is no standard arrangement structure in Community Based FEWS.
WRMA DTCM (FM)	In flood prone area should have the knowledge centre and operation centre. Library is also necessary.
Ministry of Interior	The policy of school curriculum should be considered including the view point of only flood but also disaster prevention. That will be a role of WRMA.
JICA Chief Advisor	There are 3 proposals. First is a use of flags. Second is an establishment of award program from WRMA in order to keep the motivation of gauging observers. Third is a promotion of manufacturers in FEWS activities.

(5) Site visiting the installation point of rain gauges

Installation of a conventional rain gauge near this Community Based FEWS will be better to enhance data comparison. Also it was noted that when it rains at night, warning would be disseminate. This therefore demands for a better idea.

(6) Future activities of WRUA

Eager and animated discussion, proposals were done by participants concerning the communication structures of FEWS.

	
Opening address by WRMA CEO	Opening address by representative of Taita Taveta county
	
Opening address by representative of Meru county	Presentation of FEWS by Lower Gucha Migori WRUA
	
Hand over the best observer prize from JICA long term expert	Site visiting the point of water level gauge for FEWS

Group photo of forum participants

8.5 Recommendation for nationwide expansion of FEWS

In FEWS forum mentioned above, WRMA FMU member presented the recommendation and draft plan for FEWS expansion nationwide for appropriate operation in the 3 river basin. The outline of presentation is shown below.

<Lessons learnt and recommendation for observers>

- The problem is how we can operate FEWS
- Gratitude and prize from residents live in downstream area will be effective to keep the observer's motivation.
- Training for observers is necessary.

<Lessons learnt and recommendation for WRUA>

- The main actor of FEWS is WRUA. WRUA that has flood prone areas should organize the "Flood Management Sub-Committee"
- Continuous information exchange by WRUA that has the experience of introduction or operation through the cooperation between up and down stream is necessary.
- Estimation of flood flow amount by using the hydrograph done by LOGUMI WRUA and revision of hydrograph will be necessary.

<Lessons learnt and recommendation for WRMA>

- Appropriate revision of the FEWS manual
- Additional assistance in manufacturing simplified rain gauges and water level gauges, and provision of materials
- Technical assistance for WRUA and observers
- Development of maintenance system for gauging devices

- Holding the award handover ceremony for excellent observers and WRUA
- Collection of observation data and careful investigation

<The draft plan of nationwide expansion of FEWS>

・In order to expand the community based FEWS introduced in this project to whole nation, WRMA selected 2 river basins from each of all 6 catchment areas, and totally 12 river basins will be completely covered within 3 years. Selected 12 river basins are shown below.

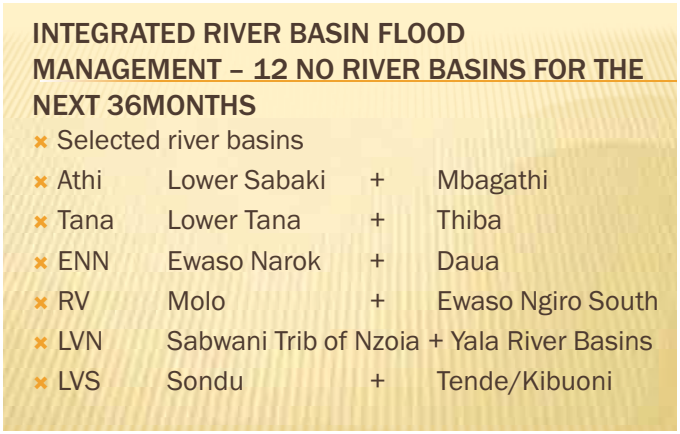


Fig. 8.5-1 The candidate river basins for nationwide installation of FEWS

Chapter 9 Community's Capacity Development on Flood Management

9.1 Survey of Community's Capacity Development on Flood Management

In the course of baseline survey, the Project Team provided the relevant communities in the river basins of the sub-catchment areas of pilot projects with questionnaires for purposes of understanding the level of knowledge of the flood control management and implementation progress of the pilot projects, as Pre-project Questionnaire.

Similar questionnaires were again administered in April and May 2014 under this Project just before its completion and herein the questionnaires are referred to as Post-project Questionnaire. The Project Team thereafter compared the Pre-project Questionnaire and the Post-project Questionnaire and evaluated the capacity of community members based on the two questionnaires.

The Table 9.1-1 shows the summary of questionnaire results though it is important to note that there was a significant difference in the number of sample and also the topographical distribution of the sample for the two questionnaires.

Table 9.1-1 Summary of Questionnaire Results on the Capacity Transition for Flood Control Management

River basin			Lumi		Isiolo		Migori	
Pre/Post			Pre	Post	Pre	Post	Pre	Post
Object person for survey	Number		386	31	161	37	180	114
	Gender	Male	179 (46%)	22 (67%)	82 (51%)	19 (51%)	90 (50/%)	55 (48%)
		Female	205 (53%)	11 (33%)	78 (48%)	18 (49%)	88 (49%)	58 (51%)

Since the Post-project Questionnaire just targeted the community members who participated in the events related to the pilot projects and the responses were received from those community members living within the three pilot projects sites.

Thus, the sampling results in the Pre-project Questionnaire were based on the responses of the community members that indicated that they lived within the pilot projects sites in effort to harmonize the two questionnaire results.

9.1.1 ISIOLO Sub-Catchment

(1) Interviewees of the Questionnaire

Sample for analysis was obtained from the community members living mainly in midstream and downstream areas of Isiolo river as Bula Pesa, Kiwanjani, Isiolo City, Mwangaza, etc. where heavy flood damages often occurrs.

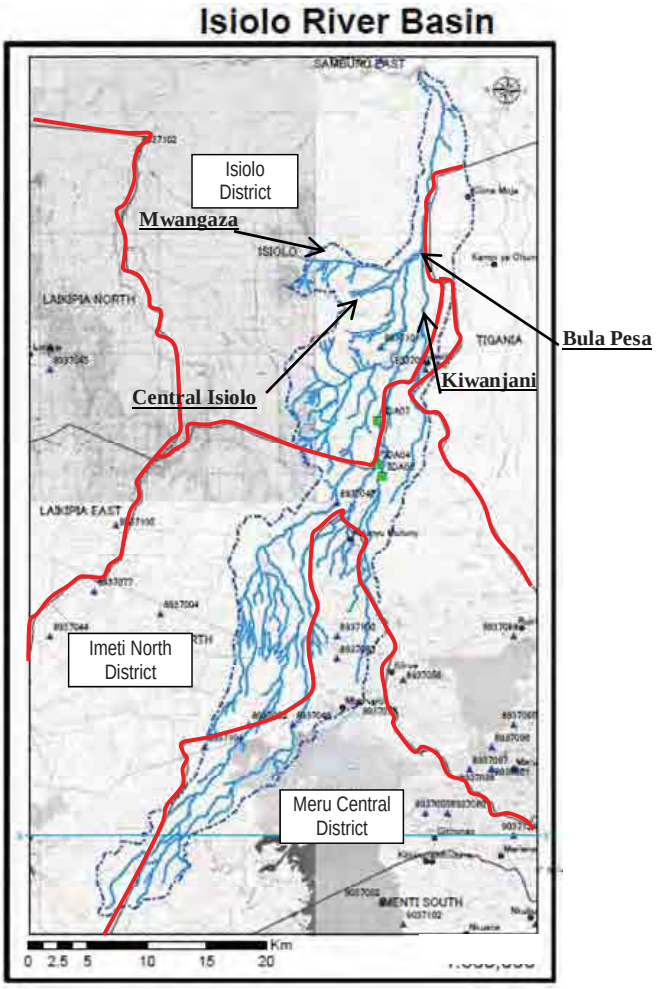


Fig 9.1-1 Inundation Area in the Isiolo River Basin

Number of the sampling for comparison was 82 in the Pre-project Questionnaire and 37 in the Post-project Questionnaire.

Although the sampling number difference was vast, the composition of age and gender were almost the same as shown in the table below.

Table 9.1-2 Sampling Compared in the Isiolo Catchment

River basin			Isiolo	
Sub-Catchment			Isiolo Sub-Catchment	
Pre/Post			Pre	Post
Interviewees for survey	Number		82	37
	Gender	Male	38(46%)	19(51%)
		Female	44(54%)	18(49%)
	Age	Oldest	68	73
		Youngest	16	22
		Average	38	40

(2) FEWS (Flood Early Warning System)

As for the provision of FEWS, 42% in the Pre-project Questionnaire and 78% in the Post-Questionnaire are the acknowledgement transition as shown below.

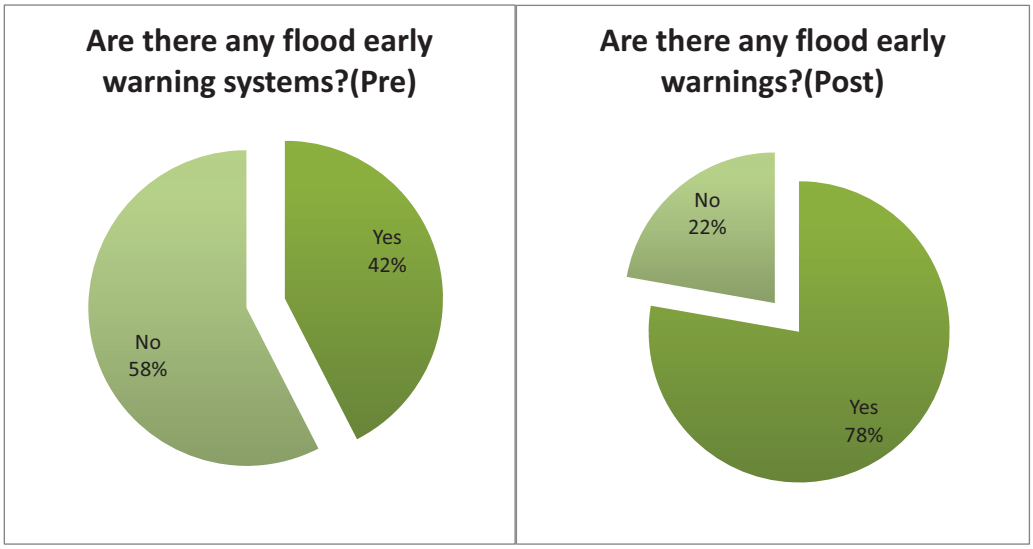


Fig 9.1-2 Acknowledgement Transition of FEWS in the Community

The increased result can be derived from the provision of FEWS implemented under this Project.

(3) Flood Protection Plan in the Community

As for the provision of flood protection plan, no significant improvement is identified from Pre-project Questionnaire to Post-project Questionnaire as shown below.

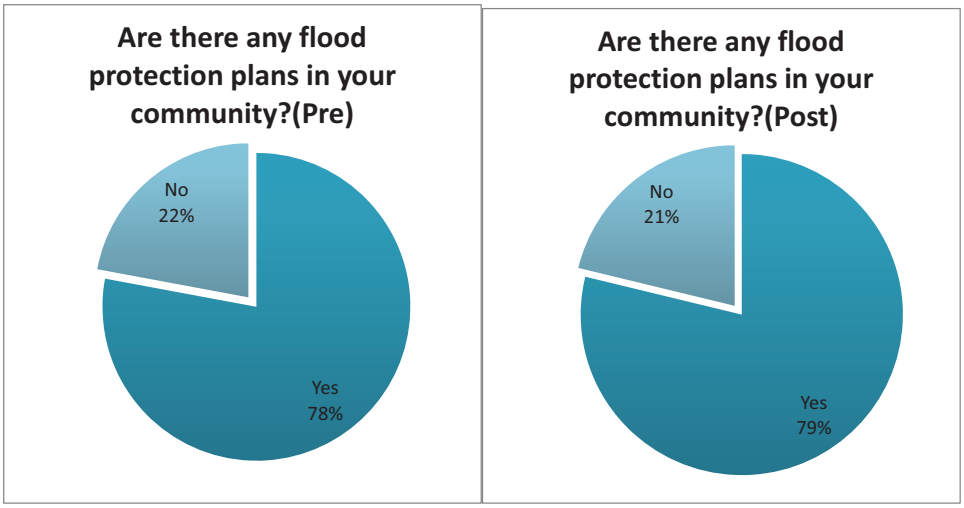


Fig 9.1-3 Provision of Flood Protection Plan in the Community

On the other hand, necessity of evacuation facilities was increasingly answered to the questionnaire on specific implementation and plan for flood protection as shown below.

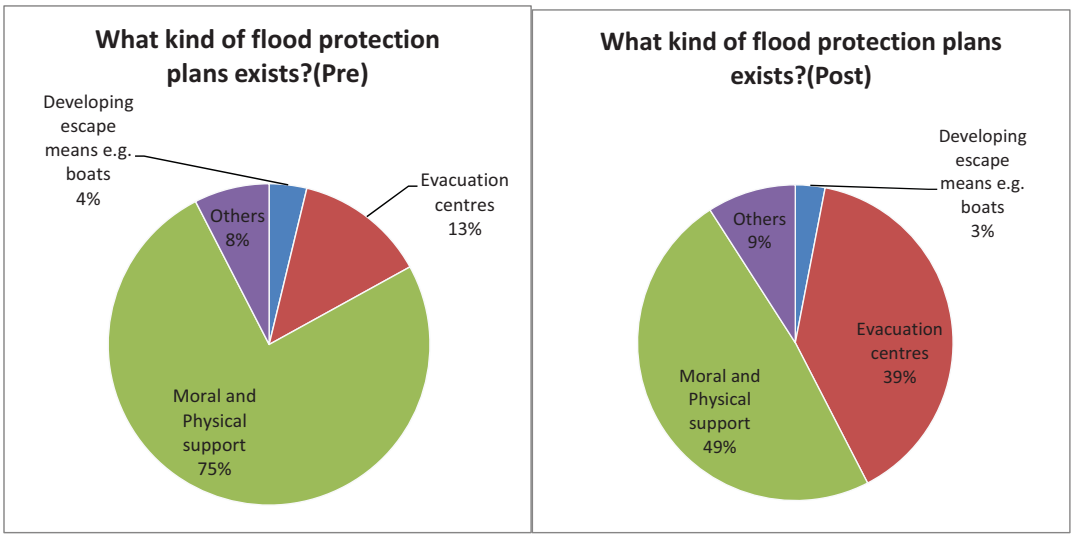


Fig 9.1-4 Flood Protection Plan Required for the Community

(4) Initial Action when Flooding

In reply to the questionnaire on how was the initial action taken by an individual when the flood occurred, the answers were almost the same in Pre-project Questionnaire and Post-project Questionnaire as shown below.

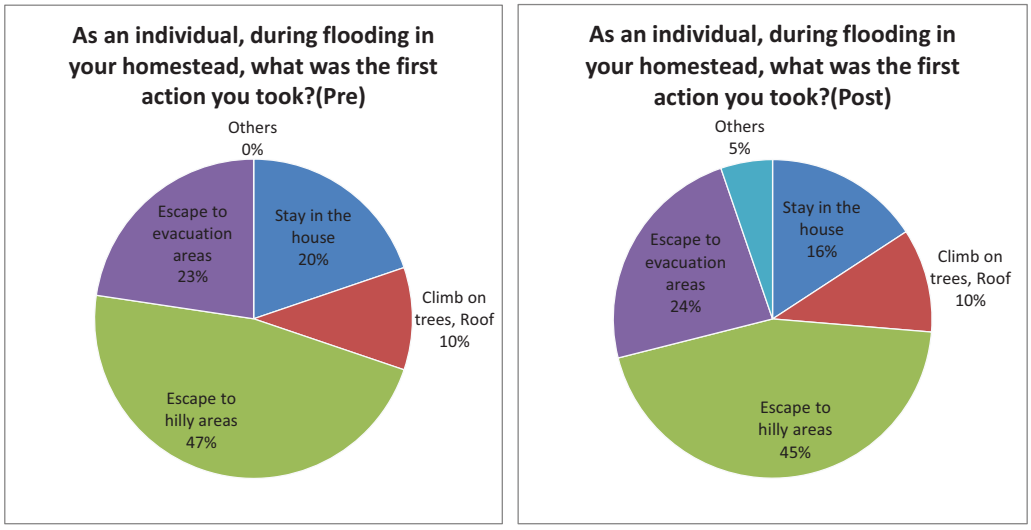


Fig 9.1-5 Personal Initial Action taken when Flooding

(5) Flood Protection Plan for House

In reply to the questionnaire on the measures taken when construction of the house, affirmative answer was 70% in the Pre-project Questionnaire and 54% in the Post-project Questionnaire as shown below.

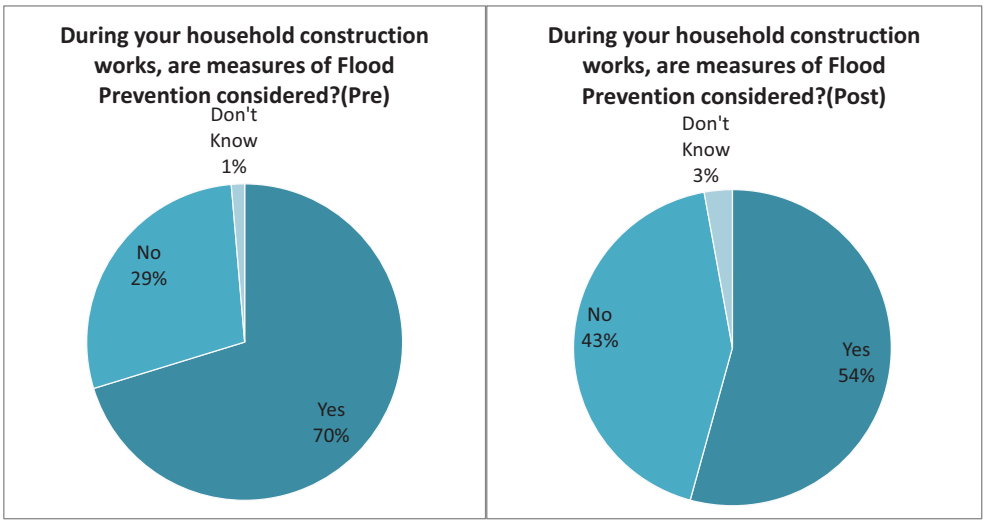


Fig 9.1-6 Measures for Flood Control when Constructing House

(6) Capacity Development for Flood Control Management

In reply to the questionnaire on participation in capacity development and training, affirmative answer was 4% in the Pre-project Questionnaire but increased to 69% in the Post-project Questionnaire as shown below.

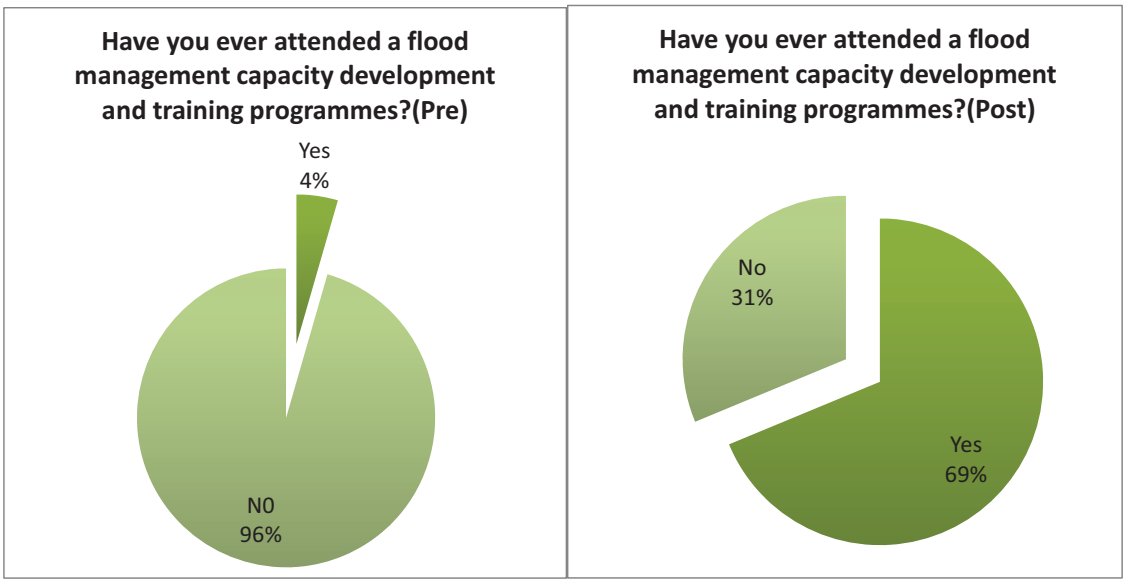


Fig 9.1-7 Participation in Capacity Development and Training for Flood Management

The increased ratio can be considered as the results of joint implementations by the Project Team and WRMA of the capacity development and training programs toward the WRUA and the communities for preparation of flood hazardous map on community basis, workshop on analysis of flood damage, pilot project implementation and so on.

In reply to the questionnaire "Have you found those lessons relevant to your handling of floods?", following answers were obtained in each Questionnaire stage.

<Replies to Pre-Questionnaire>
-Method of flood control management
-Mitigation Measures of damages caused by flood disaster

<Replies to Post-project Questionnaire >
-Excavation of drain canal and riverbed
-Knowledge about flood control management
-Timely evacuation
-Evacuation plan
-Recognition of evacuation way
-Educational movement
-Flood control management, Damage-Mitigation measures
-Early warning system, early counteractions
-Community activities

(7) Evaluation of Questionnaire Results

Significant improvements from Pre-project Questionnaire to Post-project Questionnaire, are "Recognition of FEWS" and "Participation in Capacity Development Program and Training", which can be evaluated as community-improvement in terms of its capacity development for flood control management acknowledge.

In reply to the lessons learnt from the capacity development program and training, much more answers were obtained in the Post-project Questionnaire than those in Pre-project Questionnaire in terms of both hard and soft answers, which can be evaluated as an improvement of knowledge on the community's flood management.

Whereas, no significantly improved transition was resulted as to the influence by the pilot project implemented in the sub-basin. The pilot project implemented was revetment at the banks erosion area which would cause traffic problem on the major national roads.

Once the disaster would occur to suspend traffic, huge flood damages should be expected including economic damage. When those damages could be prevented by this pilot project, indirect beneficiaries would be remarkably expected.

However, since the direct beneficiary to be bestowed by the pilot project was limited to the Church located nearby the site and Landlord of the farm, etc., effectiveness of the pilot project to the whole community was hard to be expected. Therefore, definite favorable influences by the pilot project were not appeared in the questionnaire result.

9.1.2 LOWER LUMI Sub-Catchment

(1) Objective Persons for Questionnaire

Sample for analysis was obtained from the community members living in the Lumi river basin and in the Lower Lumi sub-catchment's area of Kimorigo, Kitobo, Jipe Location, etc. at the downstream of the Lumi River where the flooding frequently occurs and experience flood damages.

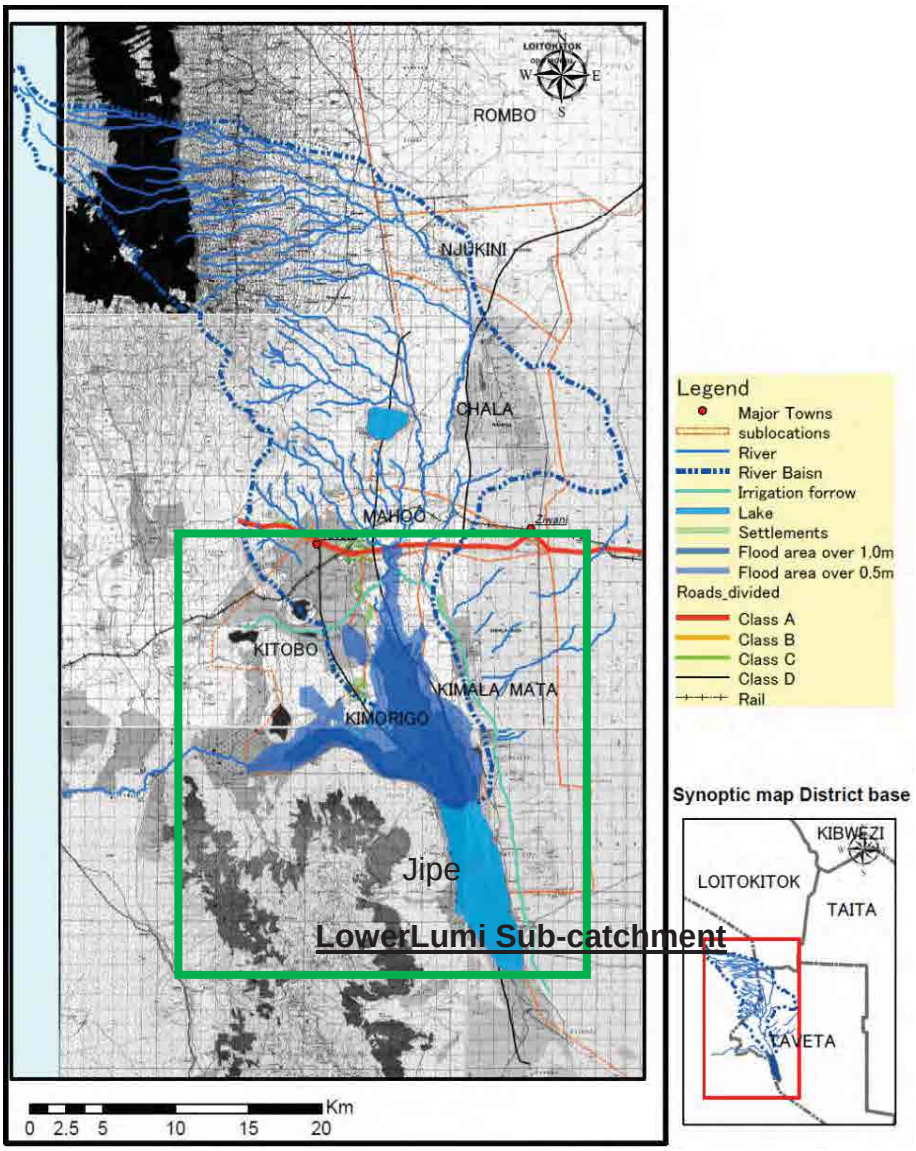


Fig 9.1-8 Inundation Area of the Lumi River

(Area surrounded by green color line shows Lower Lumi Sub-Basin.)

Number of samplings for comparison was 95 in the Pre-project Questionnaire and 31 in the Post-project Questionnaire.

Although there is a big difference in the number of interviewees, the composition of age and gender is almost the same in both questionnaires.

Table 9.1-3 Comparison of Sampling in Lower Lumi Sub-Basin

River basin			Lumi	
Sub-Catchment			Lower Lumi Sub-Catchment	
Pre/Post			Pre	Post
Object person for survey	Number		95	31
	Gender	Male	50 (53%)	22 (67%)
		Female	45 (47%)	11 (33%)
	Age	Oldest	73	70
		Youngest	18	26
		Average	42	43

(2) FEWS (Flood Early Warning System)

As for the provision of FEWS, there is no significant transition from Pre-project Questionnaire to Post- Questionnaire as shown below.

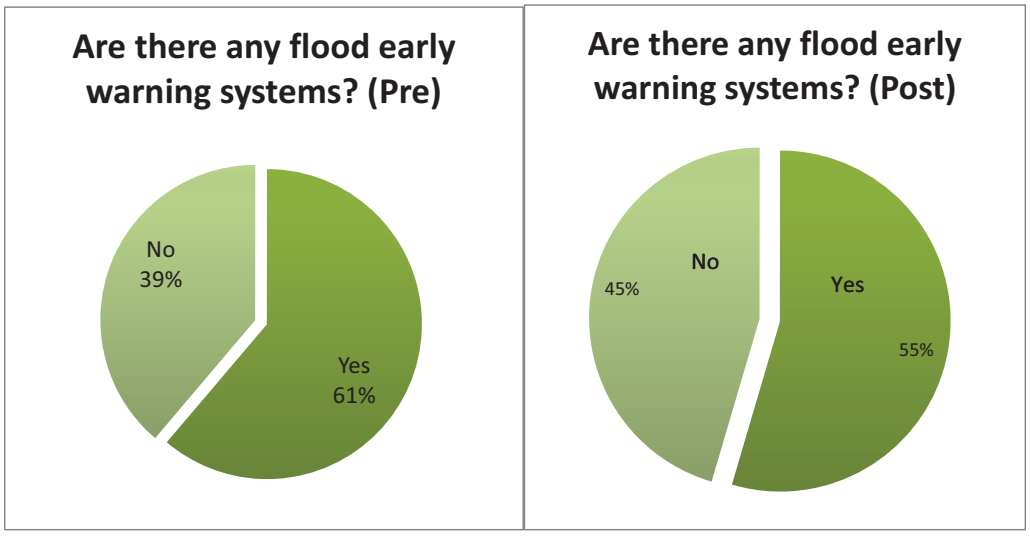


Fig 9.1-9 Acknowledgement Transition of FEWS in the Community

The reason of no significant transition can be considered because there was insufficient time for the community members to respond to the question due to short period interval since the introduction of FEWS.

Recognition and knowledge sharing by the community members on the FEWS must be enhanced by means of community sensitization and training in order to enhance effectiveness of the FEWS.

(3) Flood Protection Plan in the Community

As for the provision of the flood protection plan, affirmative answer was increased from 76% in the Pre-project Questionnaire to 94% in the Post-project Questionnaire.

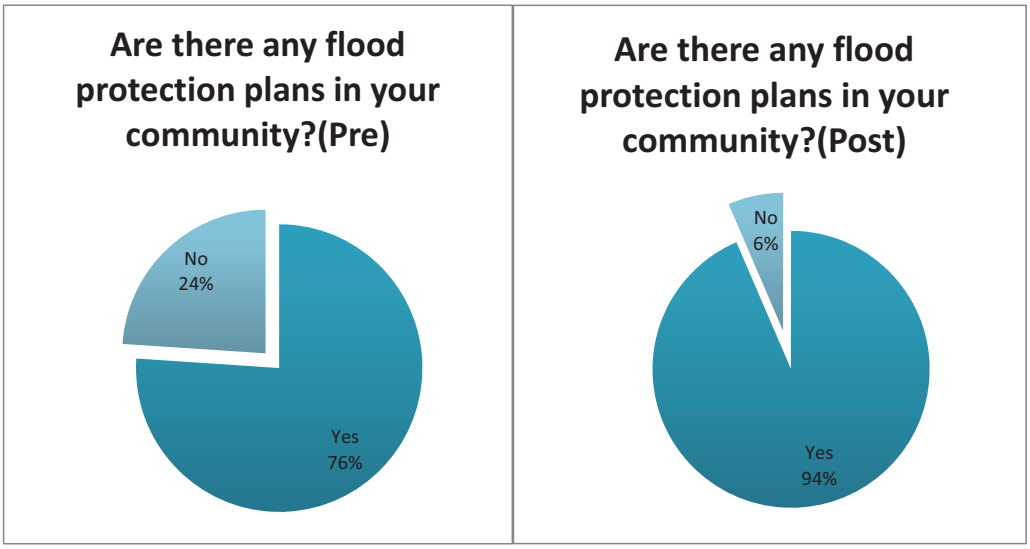


Fig 9.1-10 Provision of Flood Protection Plan in the Community

The reason of increase affirmative response can be considered to be so due to the activities for the assembly of IFMC (Integrated Flood Management Committee) and preparation of IFMP (Integrated Flood Management Plan) in the basin concerned as well as community's participation in the workshop on cause analysis of damage by flooding.

This can be duly evaluated as the first improved step for the community to develop its capacity for the concept comprehension of flood management plan.

In reply to the questionnaire on flood protection plans in the community, the answer of "evacuation facilities" increased remarkably from Pre-project Questionnaire to Post-project Questionnaire.

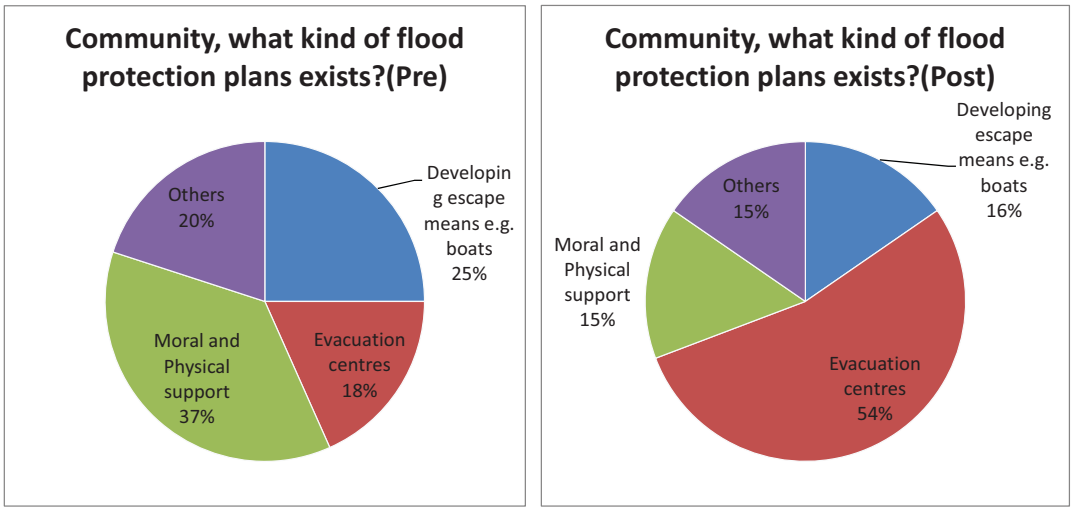


Fig 9.1-11 Kind of Flood Protection Plan within the Community

The reason of increased answer of "evacuation facilities" can be considered as the resultant activities of evacuation facilities arrangement such as construction of evacuation place, raising of toilet elevation and arrangement of raised road elevation.

(4) Initial Action when Flooding

In reply to the questionnaire on how was the initial action taken by an individual when the flood occurred while he/she was at home, answers given in the Pre-project Questionnaire and Post- questionnaire cannot be evaluated as significantly improved.

Proportions of the answers in both questionnaires are almost similar and in the rate order of "stay in the house", "escape to hilly area" and "escape to evacuation area".

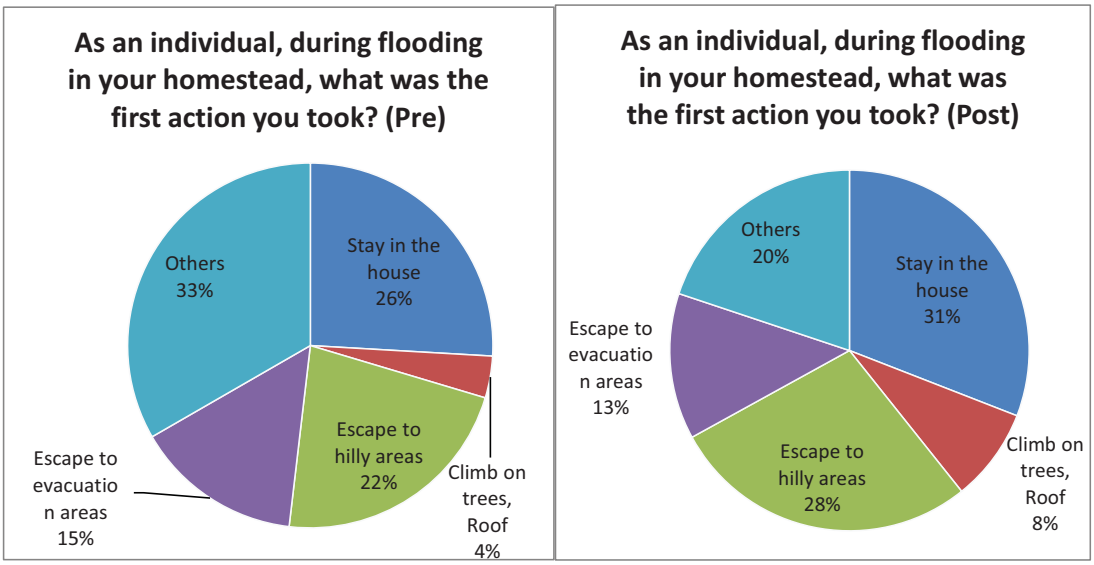


Fig 9.1-12 Personal Initial Action taken when Flooding

(5) Flood Protection Plan for House

In reply to the questionnaire on the measures taken when constructing the house, affirmative answer of 64% in the Pre-project Questionnaire increased to 87% in the Post-project Questionnaire.

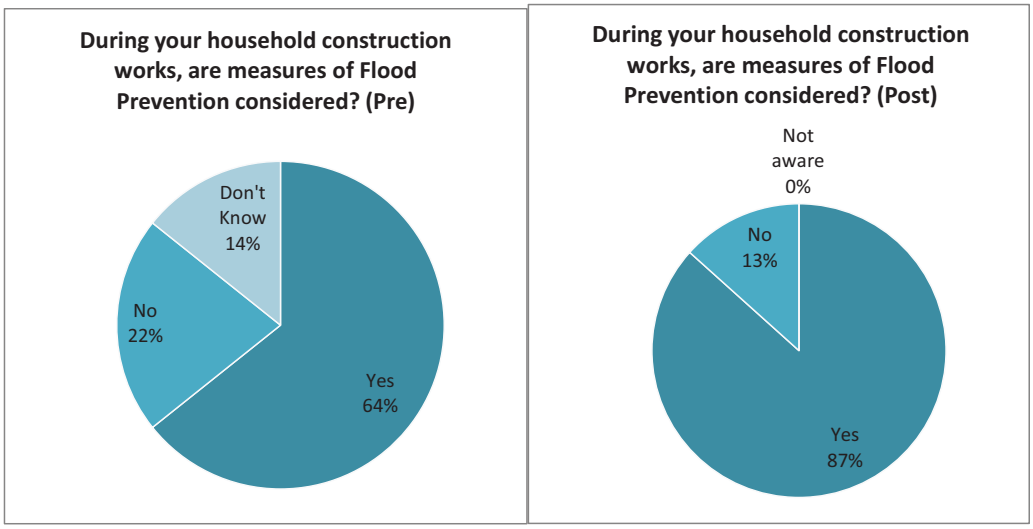


Fig 9.1-13 Measures for Flood Control when Constructing House

64% of affirmative answer in the Pre-project Questionnaire shows the community members' higher recognition of flood risk since inundation lasted for two months and caused huge damages in the flooding of rainy season in the downstream area of the Lumi river, provided that their knowledge about the mitigation measures against flood damage was insufficient.

The reason of affirmative answer increased in the Post-project Questionnaire can be considered as their acquisition of "knowledge" in addition to their risk-recognition cultivated through capacity development support and disaster prevention education implemented in this Project.

(6) Capacity Development for Flood Control Management

In reply to the questionnaire on participation in the capacity development and training programs, affirmative answer of 25% in the Pre-project Questionnaire increased to 54% in the Post-project Questionnaire.

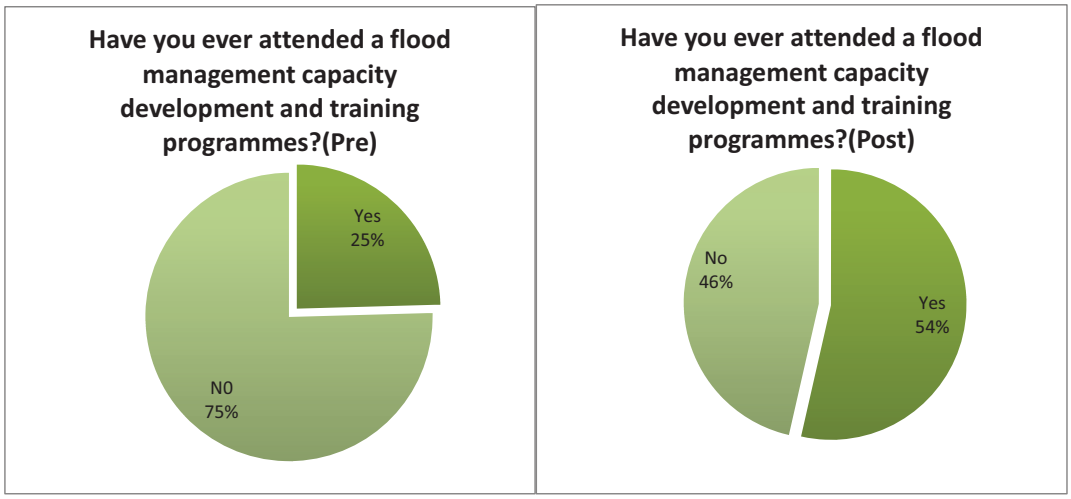


Fig 9.1-14 Participation in Capacity Development and Training Programs for Flood Control Management

The reason of increased affirmative answer can be considered as the resultant effects of the activities by the Project Team and WRMA personnel to the community consisting of mainly WRUA members aiming at improving capacity for flood control management.

On the other aspect, more than 40% of non-attendance to the flood management capacity development and training programs showed even in the Post-project Questionnaire.

It is indispensable for WRMA to have further positive opportunities toward WRUA and the community after completion of this Project, too.

In reply to the questionnaire "Have you found those lessons relevant to your handling of floods?",

The following answers were obtained in respective questionnaire stages.

<Replies to Pre-Questionnaire>
-How to prepare the Proposal
-Mitigation Measures against damage caused by flood disaster

<Replies to Post-project Questionnaire >
-Disaster Prevention Education
-Evacuation Measures
-Flood control management, Damage-Mitigation measures
-Occurrence of flood damage and its causes
-FEWS and Evacuation

Comparing those replies in respective questionnaire, such key words as "disaster prevention education", "evacuation measures", FEW and evacuation measure in cooperative and self ways" increasingly appeared in the Post-project Questionnaire.

It is judged as well that arrangement of evacuation facilities, provision of FEWS and holding

of workshops for flooding characteristics analysis of the area concerned in connection with the preparation of IFMP (Integrated Flood Management Plan) have effectively encouraged such improvements through the Project implementation.

(7) Evaluation of Questionnaire Results

Such additional questionnaires as "whether or not the flooding measures in the community are provided", "whether or not the measures for flooding when constructing house are provided", "whether or not the community members have participated in capacity development program for flood control management", etc. were made in the questionnaires.

Affirmative answers to those questionnaires increased in the Post-project Questionnaire, which can be evaluated as improvements in terms of community's flood management capacity.

Further, such replies as "evacuation facilities" and "provision of FEWS" are made, which are reflections of the activities of this Project. This means those activities are duly recognized in some communities.

On the other hand, there are some replies which do not reflect those activities to the queries related to the inhabitant's recognition of the flood risks.

Those replies can be evaluated that the Pilot Project has affected the recognition of the community members there partially but in limited aspects in the Lumi river basin.

It is requisite that the relationship of WRMA and WRUA shall be continued and activities for flood management inclusive of the community members shall be implemented even after this Project is completed.

9.1.3 LOWER GUCHA MIGORI Sub-Catchment

(1) Objective Persons for Questionnaire

Sampling for analysis was obtained from the community members living in Aneko, Central Kadem, Karapol, Amoyo Central, etc. located at the river-mouth of downstream of Gucha Migori River where flooding has frequently occurred.

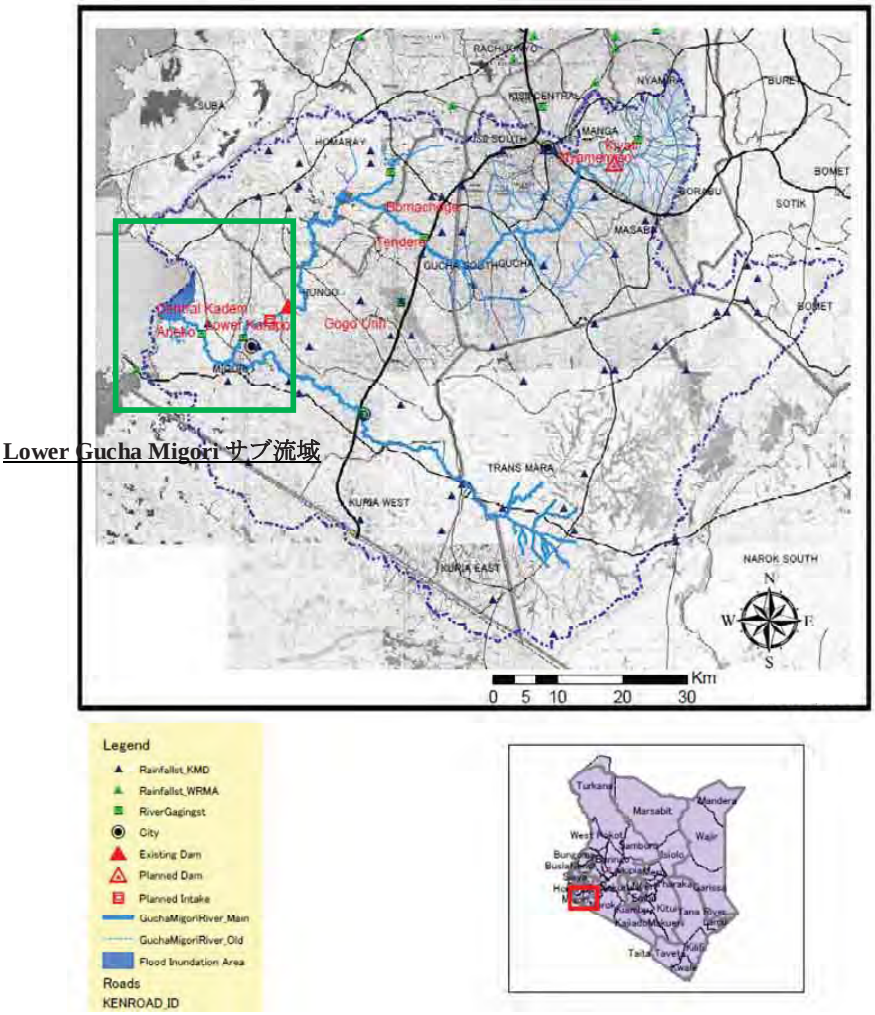


Fig 9.1-15 Gucha Migori River Basin

(Area surrounded by green color shows Lower Gucha Migori Sub-Basin.)

Number of samplings for comparison was 56 in the Pre-project Questionnaire and 114 in the Post- Questionnaire.

Although the number of interviewees is remarkably different, composition of age and gender is almost the same in both questionnaires.

Table 9.1.4 Comparison of Sampling in Lower Gucha Migori Sub-Basin

River basin			Gucha Migori	
Sub-Catchment			Lower Gucha Migori Sub-Catchment	
Pre/Post			Pre	Post
Object person for survey	Number		56	114
	Gender	Male	31 (55%)	55 (48%)
		Female	25 (45%)	58 (51%)
	Age	Oldest	90	74
		Youngest	25	18
		Average	48	39

(2) FEWS (Flood Early Warning System)

As for the provision of FEWS, affirmative answer of 48% in the Pre-project Questionnaire increased to 83% in the Post-project Questionnaire.

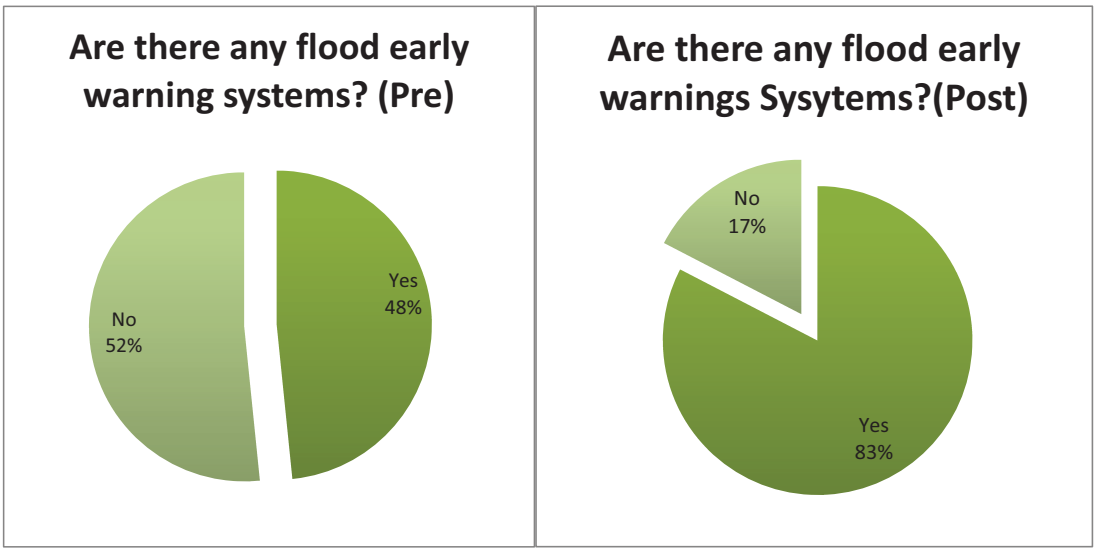


Fig 9.1-16 Acknowledge Transition of FEWS in the Community

The reason of increased affirmative response in the Post-project Questionnaire can be deduced to as resultant of enlightenment of the community members by LOGUMI WRUA in charge of the Lower Gucha Migori Sub-Basin.

LOGUMI WRUA in cooperation with several WRUAs in the upstream area of Gucha Migori River proceeded with installation and operation of FEWS before the completion of this Project in such a positive manner which included surrendering the FEWS equipment and tools to the WRUA in the upstream areas, this kind of venture led to more enlightening of the communities' leading to more community members to understand the concept of FEWS.

(3) Flood Protection Plan in the Community

As for the provision of the flood protection plan, almost the same replies were disclosed in both questionnaires.

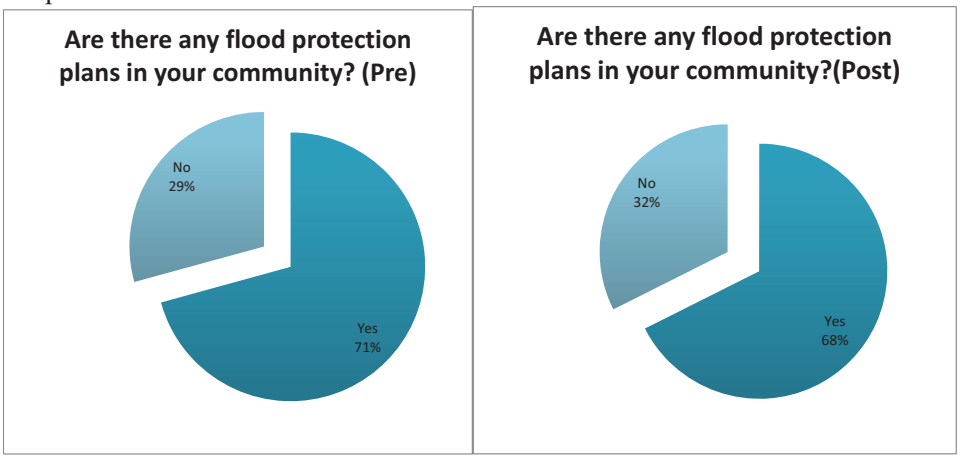


Fig 9.1-17 Provision of Flood Protection Plan in the Community

Whereas, replies to the query of the kind of flood protection plans show remarkable change between Pre-project Questionnaire and Post-project Questionnaire.

More than 70% of the replies in the Pre-project Questionnaire showed abstract ones as "moral and physical support", specific replies in the Post-project Questionnaire showed more than 70% such as "developing escape means of boats, etc." and "evacuation centers".

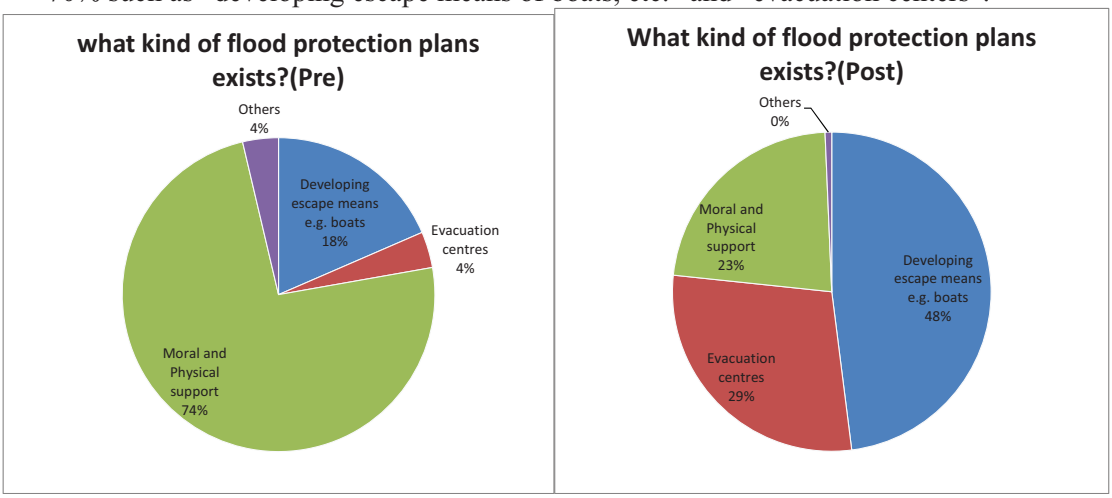


Fig 9.1-18 Kinds of Flood Protection Plan in the Community

(4) Initial Action when Flooding

In reply to the query on how was the initial action taken by an individual when the flood occurred while he/she was at home, remarkable changes of the answer between the Pre-project Questionnaire and the Post-project Questionnaire are the following 2 points, i.e., increased answer of "escape to evacuation areas" in the Post-project Questionnaire and the answer rate of "escape to hilly areas" decreased from 50% to 30%.

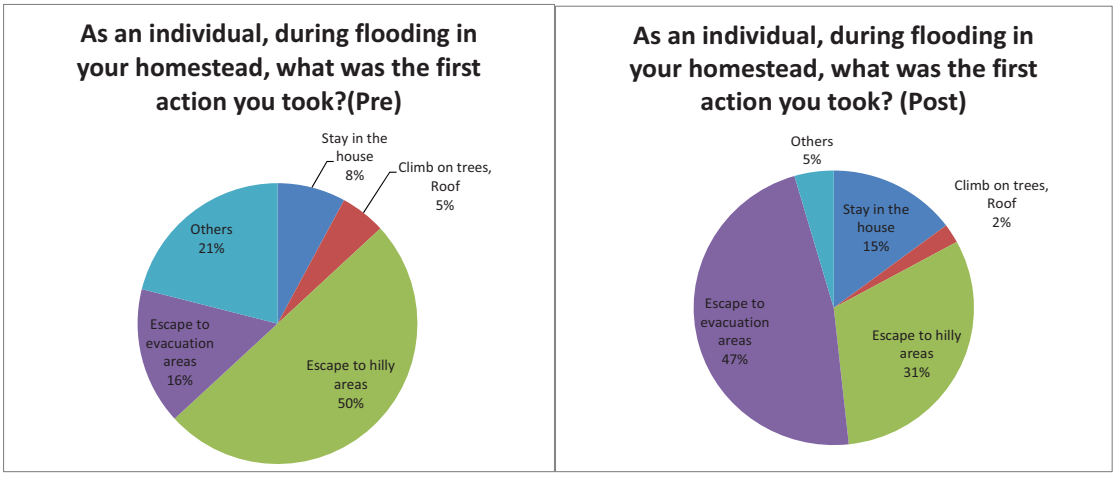


Fig 9.1-19 Personal Initial Action taken when Flooding

(5) Flood Protection Plan for House

Replies to the questionnaire on the measures taken when constructing the house, showed different affirmative answer rate as below, however, it is unknown whether the change of the rate is significant or not.

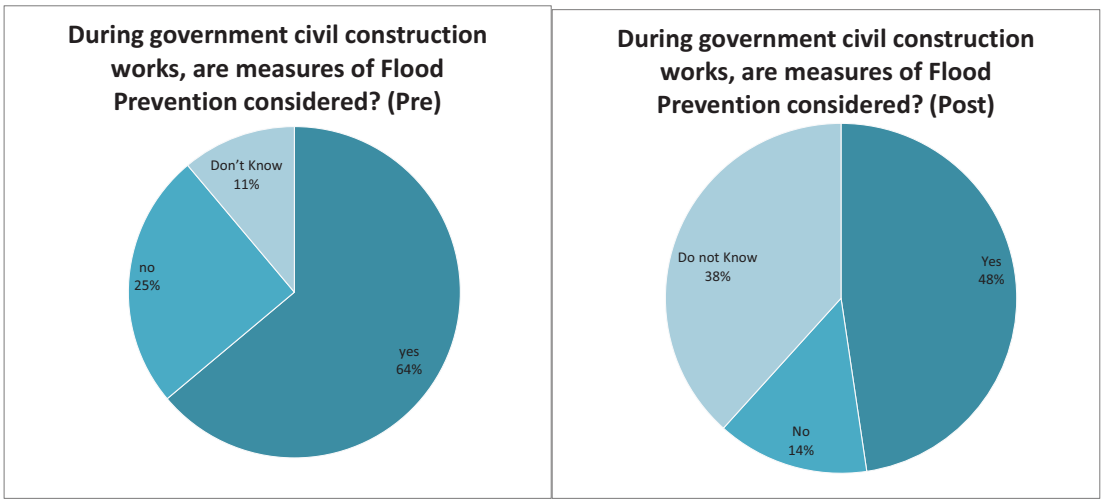


Fig 9.1-20 Measures for Flood Control when Constructing House

(6) Capacity Development for Flood Control Management

Affirmative answer of 38% in the Pre-project Questionnaire increased to 56% in the Post-Questionnaire to the questionnaire on participation in the capacity development and training programs.

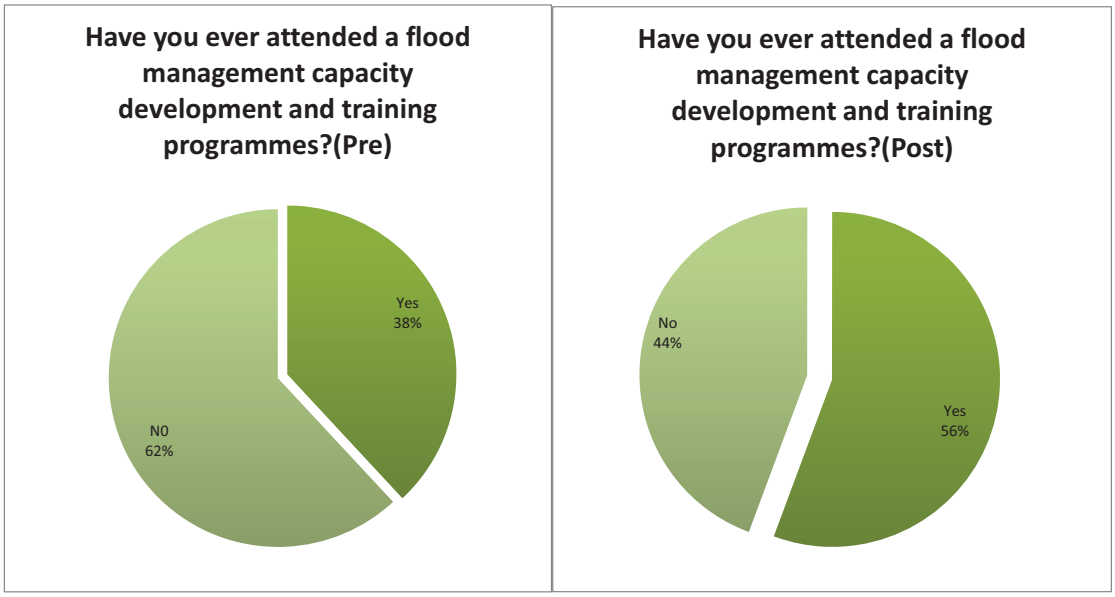


Fig 9.1-21 Participation in Capacity Development and Training Programs for Flood Control Management

In reply to the questionnaire "Have you found those lessons relevant to your handling of floods?", following answers were obtained in respective questionnaire stages.

<Replies to Pre-Questionnaire>
-How to prepare Proposal
-Mitigation Measures against damages caused by flood disaster
-Plantation
-Flood management

<Replies to Post-project Questionnaire >
-Disaster Prevention Education
-Evacuation Measures
-Flood control Management, Damage-Mitigation measures
-Evacuation ways and areas on the hazardous map
-Substance of "Flood is manageable."
-Substance of "Flood is natural phenomenon and difficult to cease."
-Attention call of flooding
-Early warning sign and possible countermeasures of flooding
-Occurrence of flood damage and its causes
-FEWS

Answering rate was 20% to the Pre-Questionnaire, but over 50% to the Post-project Questionnaire.

Answers in the latter questionnaire showed more specific like "Flood itself is a natural phenomenon and impossible to cease, but, the damages by it can be prevented and mitigated by adopted positive usage of hazardous map and warning system, which revealed improvement of the flood control capacity of the community concerned.

(7) Evaluation of Questionnaire Results

Remarkably identified transitions from the Pre-project Questionnaire to the Post-project Questionnaire , are "Recognition of FEWS" and "Participation in the Capacity Development Program", both of them showed drastic increase in the latter questionnaire, which can be evaluated as improved results in terms of capacity development.

As for the query of any acquaintance of lessons learnt from the capacity development and training programs, more answers including specific utilization of software were shown in the Post-project Questionnaire, which can be evaluated that communities' knowledge was improved.

9.2 Summary of Community's Capacity Development on Flood Management

In the three project target Sub Catchments, it seemed that capacity on "Recognition of FEWS" and "Participation in the Capacity Development Program" was improved from the pre-project survey to the post-project survey. In this sense, community's capacity on flood management seems to be developed.

Therefore, although there are some challenges to be solved, the system to enhance the capacity on flood management at the community level through WRMA and WRUA is indicated to be effective.

Chapter 10 Establishment of Manual for Community Based Activities and the case and lessons and the cases and the lessons based on the community based activities

In this section, explains activities in relation with following defined inputs of PDM.

2-8) WG prepares materials describing the cases and the lessons based on the community based activities.

2-9) WG contributes the cases and the lessons of the community based activities to the knowledge management mechanism.

Project Team identified the relationship between action framework of WRMA/WRUA and manual in case of the structural measures on community based disaster management activity. Then Project Team developed the supporting manual of general procurement including consensus, contract, and monitoring, and action manuals of construction works, maintenance, and disaster management activities (non-construction). Also Project Team developed Lessons Learnt from experiences in this project for future reference.

Furthermore, Project Team made recommendation of expected framework of active community participation style flood management according to the recent stream of decentralized society and experiences in this Project.

10.1 Background

WRMA developed WDC manual for capacity development of WRUA, and each WRUA is thereafter expected to formulate SCMP by utilization of WDC manual, and then undertake water resource management including flood management. This Project therefore assisted WRMA in the revision of WDC manual to incorporate flood management.
The procurement of goods and services by WRUA is necessary for water resource management activities including flood management. However it is captured in a very small volumes in the WDC Manual Vol 2: Appendix H. The guidelines therefore are not sufficient for WRUA members, also for WRMA staffs. In one of the discussion with WRMA it was identified as one of barrier that hinders WRUA activity. WDC Framework Contract states as follows:

(Selected from WDC Manual Vol 2: Appendix H. WDC Framework Contract)

4.2 Procurement of Goods and Services

Procurement Committee

4.2.1 The WRUA will establish a Procurement Sub-Committee consisting of at least 3 persons. The members of the Procurement Sub-Committee may not be also members of the Monitoring or Finance Sub-Committees.

4.2.2 The selection process of the members of the Procurement Sub-Committee is to be stated in the WRUA Constitution or shall be decided by the General Assembly.

4.2.3 The names of the Procurement sub-Committee members are to be stated in the Project Request for Funds.

Procurement of Goods

4.2.4 In regard to items to be procured at any one time for which the total amount to be procured does not exceed Ksh 10,000 procurement can be made through direct purchase on the checking of prices, however written quotations will not be required.

4.2.5 For all procurement of goods and/or services (including contractors) for the project, between a total of Ksh 10,000 to a total of Ksh 100,000 a minimum of three written competitive offers will be required. The determination of the supplier is made by the procurement sub-committee. The quotations and evaluation should be documented and available for review/audit.

4.2.6 The selection of the supplier will be made by the Procurement Sub-Committee based on the quotations, taking into account price, quality, availability and timeliness of delivery.

Soliciting bids – requesting quotation

4.2.7 In regard to items to be procured at any one time for which the total amount to be procured exceeds an estimated Ksh 100,000, the Procurement Sub-Committee will:
- Prepare the list of items to be procured.
- Determine the closing date for the submission of quotations
- Determine the list of suppliers to be invited to quote. The list shall be approved by the Management Committee prior to requesting quotations and shall be displayed on the WRUA notice board
- Send out the requests for quotations ensuring a reasonable period of time for suppliers to prepare their quotations
- Arrange for the opening and evaluation of quotations
- Evaluate and determine the preferred supplier
- Document the evaluation process and forward for adoption by the Management Committee.
- Prepare as necessary the contract for the procurement of items.
- Procurement of Services

4.2.8 The procurement of services will follow the same procedures as for the procurement of goods.

4.2.9 The supply contracts for the provision of skilled and unskilled labour shall follow the procedures as indicated above.

4.2.10 Payments to any contractor for the civil works within the scope of the project should be based on the agreed and signed contract with the contractor.

4.2.11 The contract with the contractor will be prepared and signed by the Chairman, Secretary and Treasurer.

4.2.12 All part payments will be based on staged payments reflected in the work plan, schedule and budget in the contract.

Actually, WRUA sub-committees under this Project were ignorant of these guidelines due to fewer references. It is considered that if further flood countermeasures would be conducted by WRUA through the utilization of WDC manual, this kind of scenario should be considered. Therefore, this Project focused to develop supporting manual of WRUA activities to cover the procurement part of the WDC manual.

10.2 The relationship between action framework of WRMA/WRUA and manual in case of structural measures on community based disaster management activity

The diagram that shows the relationship between actions framework of WRMA/WRUA and manual in case of structural measures on community based disaster management activity is as captured in the fig. 10.2-1.

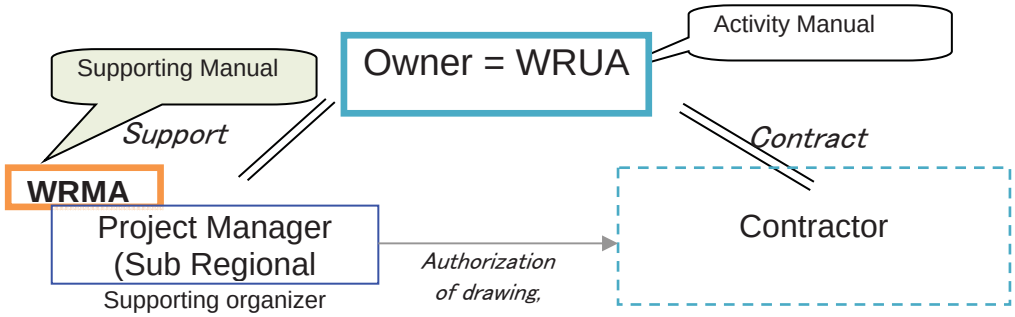


Fig. 10.2-1 Correlation chart of stakeholders in structural measure

WRUA, as owner of the structural measure makes the contract with contractor, and WRUA keeps the original. WRMA Sub Regional Manager (SRM), as the Project Manager, is in charge of advising WRUA. With the WRMA's support, WRUA implements community based disaster management activity by facilitating the activity and ensuring the contribution of local residents such as gathering boulders and do-nou works. Therefore, supporting manual is aimed at WRMA supporting WRUA.

10.3 Supporting Manual of CBDM activities (Structural measures)

10.3.1 Contract

In WDC process, WRMA in collaboration with WRUA should conduct processes of formulation, feasibility study, planning, legal authorization, procurement, construction, and operation. In this Project, WRMA and WRUA's part are indicated at each steps for easy understanding. During this Project the Project Team provided necessary support. Finally Project Team concluded by recommending the functions of WRMA and WRUA.

Tab 10.3-1 is a sample of supporting manual, and table10.3-2 is the example of the part of "Expression of Interest (EOI)".

Table 10.3-1 Image of supporting manual

Title of execution - Necessary step for execution - Concerning points	WRMA's part - Leading points - Outer resources, Good practices, Lessons Learnt
	WRUA's part - Preparation points - Action points

Table 10.3-2 Example of "Expression of Interest (EOI)" in supporting manual

Expression of Interest (EOI) - To send a request letter of Expression of Interest (EOI) to the long listed contractors.	WRMA's part - To show a sample of EOI - To keep records of delivery of EoI letters
- The minimum requirements for submissions included; status and class of company, information of financial status, experience of similar works in the last three years and the personnel capacity complete with CVs.	WRUA's part - Procurement Sub-committee to understand the content of EoI such issues such as the minimum requirement, deadline of submission should be clear.

Necessary documents in each steps are attached in supporting manual as examples from past activities, they will be useful for future supporting of new activities.

Also, failures and lessons are shown in each steps of supporting manual and this will be useful for future activities.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P.O BOX 330
ISIOLO
CELL: 0721921186

Fig. 10.3-1 Example of necessary document in supporting manual

Table 10.3-3 Example of lessons learnt in supporting manual

(Case in Isiolo) 11no. contractors out of eligible 24no. submitted their EoI letter for River bank constructions works in Eastern Marania Isiolo Pilot Project Site.
Eleven (11)contractors were evaluated for prequalification based on the contents of the instruction from the EoI letter. Five (5) Contractors qualified for the next stage of bidding.
It should be considered to hold an explanatory meeting to long listed contractors to get attention to the contract.
Other than having explanatory meeting there should be public announcement methods like putting notice on information boards of public buildings.
(Case in Lumi) The pre-qualification for the contractors was carried out and only 5 contractors selected for the next tendering stage. No communication was provided for the contractors not selected. The unsuccessful

Project Team initially considered to utilize documents that had been used by WRUA for making bidding and contract documents. However most of the WRUAs are only in the second level of WDC funding, and also there were no full-fledged works and no appropriate documents. The contract documents of the training course were provided by WSTF and were too simple for construction work contracts. Therefore Project Team decided to modify the documents that WRMA had used for construction works contract and customized these documents to fit the WRUA's contract level.

Actual WRMA's documents for reference are taken from following project. "Procurement of works for the Construction of Mombasa sub-region offices block

Also WRMA provided following other documents of construction works in Kenya." And "Standard Tendering Document, Procurement of Works, Small Works (Public Procurement Oversight Authority)"

This works were small scale works of under KShs.200 million, but this sum is much higher than the pilot project size of KShs. 5million. But the contents are similar as above mentioned WRMA's documents, so Project Team modified based on this WRMA's document but in consideration that the amount was to be of smaller scale works.

The framework of referenced bidding documents are as shown at table 10.3-4. And the documents of contract are made by reconfiguration as follows:

Table 10.3-4 Framework of bidding documents and contract documents for construction in WRMA

	Bidding documents		Contract documents
			Agreement Letter of Acceptance Contractor's Bid
Section I	Instructions to Bidders		General Conditions of Contract
Section II	General Conditions of Contract		Special Conditions of Contract
Section III	Special Conditions of Contract		Specifications and Performance Requirements
Section IV	Bidding Data Sheet, Forms of Bid, Qualification Information, Letter of Acceptance, Agreement		Drawings
Section V	Drawings		Bill of Quantities
Section VI	Bill of Quantities		
Section VII	Specifications and Performance Requirements		

This framework was used for bidding documents and contract documents for the pilot projects. Those documents are attached to the manual as reference material.

10.3.2 Consensus building

It is considered generally that consensus building for water resource management including flood management in Kenya is needed based on the following stages:

- Stage of selecting project menu and place
- Stage of decision-making of residents contribution at construction and operation/maintenance phases.

Usually, decision makings for project planning and selection are conducted as per the SCMP formulation meeting with WRUA management committee and sub-committee or representatives of block at the project study process of WDC as follows.

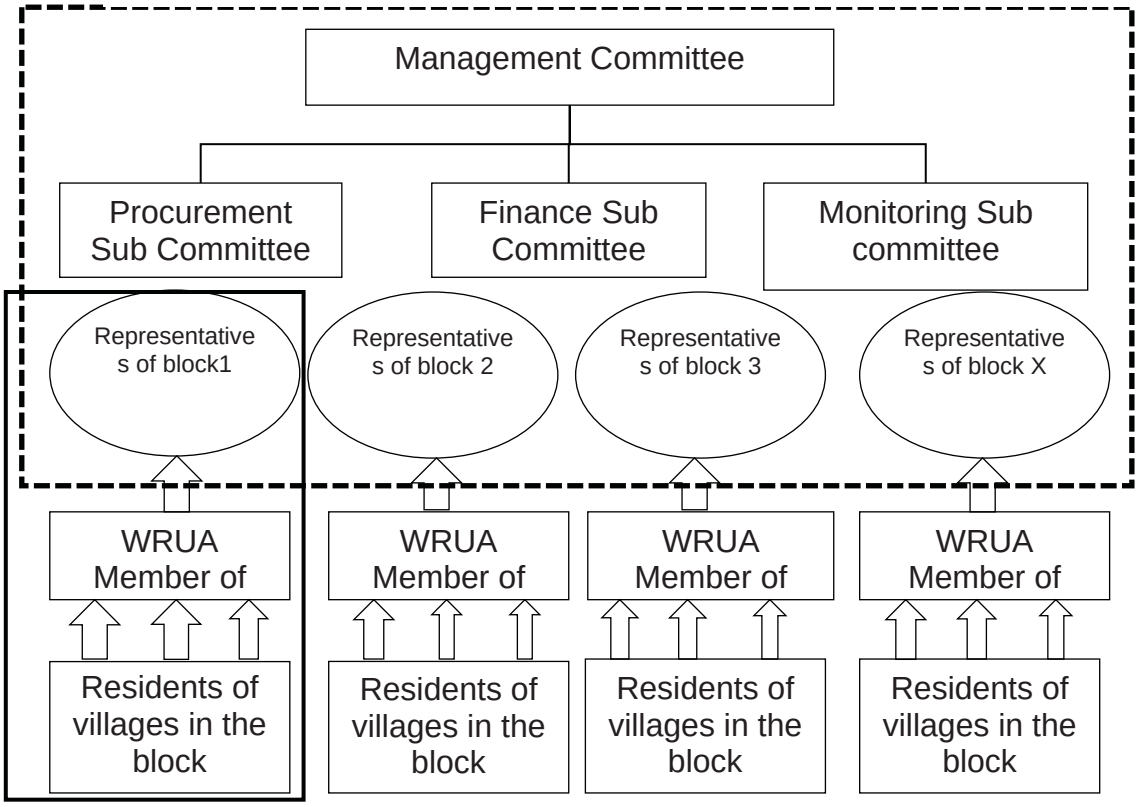


Fig. 10.3-2 Consensus building through SCMP formulation meeting

In this Project, decision making was conducted as per the following steps:

1) Field survey including hearing by PROJECT TEAM
2) Meeting with WRUA for measurement
3) Meeting with WRMA-HQs
4) Stakeholders meeting or IFMC meeting
5) Decision making of measurement by stakeholders at IFMC meeting
6) Decision making of measurement and residential contribution at meeting to explain to local residents

It should be noted that the decision making step in this project is different from the usual normal case, but the WRUA Committee members and representatives of block decided during an IFMC meeting.

(1) Decision making in Nyando project

Provincial Administration (PA) system was used for decision-making in the Nyando project because WRUA concept had not been internalized in the basin. PA system is the local governance structure system by Commissioner and Chief/Assistant Chief.

Decision-making and governance in the village or low-end level ,is conducted by Elder elected by local residents. Thus JICA study team surveyed candidate villages for the project based on flood disaster history, then location chief contacted villages for decision-making with local residents.

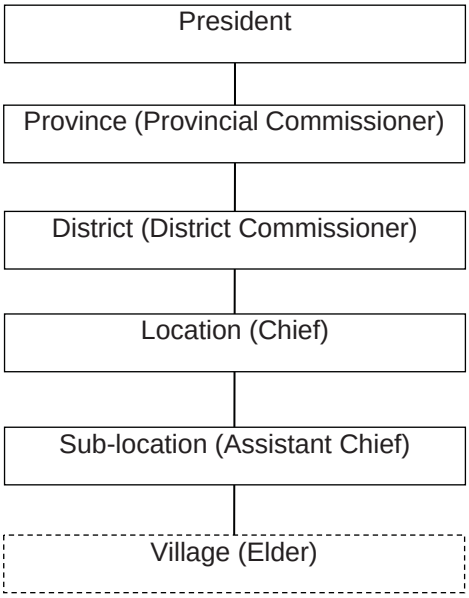


Fig. 10.3-3 Provincial Administration System

(2) Community Contribution

In the case of Isiolo, gathering boulders was agreed upon as community's contribution, and eventually the community members did not make this contribution. But instead the WRUA chairman provided his own boulders.

Following are the causes for problem encountered on community contribution:

1) The agreed period for community contribution was during the dry, off-agricultural season. However the actual construction started during the rainy, busy farming season and most of the WRUA and community member are farmer, therefore they did not have time to gather boulders as their contribution because of their engagement in their daily livelihood activity of agriculture.
2) The contractor wanted to finish his work earlier than scheduled time on the contract and therefore he could not wait coming for the dry season.
3) There was also less incentive for WRUA and community member to gather boulder. WRUA proposed to pay transportation fee and provide lunch, but Project Team disagreed with this idea because this activity was considered as community contribution.
4) The bank erosion was recognized as the problem of Isiolo river basin, but the pilot project place was not in the residential area of the affected place, but rather near the church land.
5) There are many projects on flood/drought that are conducted in Isiolo area by foreign donors, therefore community members' assumption was that when they work for the projects they earn for example some trade-off such as "Food for Work", and "Money for Work".
6) The church community where the pilot project area was located had no experience in dealing with external donor and it was their first experience to work with foreign donor.

It is imperative to note that though community members did not participate in the gathering of

boulders, they participated in the Operation and Maintenance (O&M) training of gabion and they promised future maintenance of gabion wall.

The case was different in Lower Lumi. School Management Committee (SMC) of Eldoro Primary School had experience with donors in project implementation such as WFP, they actively participated in the planning meeting. Also many people participated in that meeting wherein explanation to local residents was done and they agreed on their contribution and which they implemented during actual pilot project implementation.

The reason for the difference between success in Lower Lumi and difficulty in Isiolo, are as follows:

1) Gathering of the boulders, was the first step of the construction, and was what was targeted as the community contribution in Isiolo. But the raised evacuation road, was the final step of the construction and was the community contribution in Lower Lumi. In this regard therefore community members in Isiolo could not fathom the direct benefit of the construction, while the community members in Lower Lumi saw the necessity of the raised evacuation road by themselves after observing the construction of the evacuation hall and raised toilet.
2) In Isiolo contractor needed boulders to commence construction, and therefore he could not wait for community contribution. But contractor in Lower Lumi did not have to wait for community contribution, and all he needed was to bring murram (soil) for raised evacuation road.
3) Do-nou technology conducted at Lower Lumi is popular as the method to improve agricultural feeder roads in Kenya. It is imperative to note that if a person has the certificate of Do-nou technology, he can register as contractor of small scale road maintenance. Also the governor of Taita-County studied his primary education at Eldoro Primary School, and he has since promised SMC of Eldoro Primary School to make them an offer for road maintenance if SMC could show him the certificate of Do-nou technology. This means that the community members in Lumi had a specific incentive for raising the road.
4) The ground condition in Eldoro Primary School is not good during the wet season and therefore the parents were able to understand the advantages of the raised road in the school implied better road condition for their children.

10.3.3 Technical support

The technical supporting manuals to making/maintaining gabion for protection river bank against erosion, and do-nou work for raised evacuation road are developed in this Project.

The followings are the framework of supporting manual:

(1) Framework of supporting activity manual

Table 10.3-1 Image of supporting manual

<table>
<tr><td rowspan="2">Title of execution
- Necessary step for execution
- Concerning points
- Chart, photo, figure, etc.</td><td>WRMA’s part
- Leading points
- Outer resources, Good practices, Lessons Learnt</td></tr>
<tr><td>WRUA’s part
- Preparation points
- Action points</td></tr>
</table>

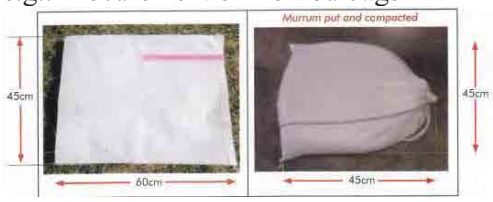
(2) Overall

Table 10.3-2 Overall image of supporting manual

<table>
<tr>
<td rowspan="2">e.g.: Project flowchart
Project outline
↓
Community meeting
↓
Detailed design
↓
Estimation of the amount of Do-nou bags and murrams
↓
Procurement of Do-nou bags
↓
Procurement of tools
↓
Schedule and assignment
↓
Making container
↓
Preparation the place
↓
Filling Do-nou
↓
Lay-down and compaction
↓
Apply murram
↓
Compaction
↓
Check caber and desing, and modification</td>
<td>WRMA’s part
・Advice
- To make advice of adequacy of the project
- To participate community meeting
- To check the detailed plan
- To support getting tools
・Outside resources
- CORE
- To introduce Do-nou technology method training
・Case study, good practice
- To introduce past examples</td>
</tr>
<tr>
<td>WRUA’s part
- To conduct each step of action
- To call on community
- To research advanced project/ good practice</td>
</tr>
</table>

(3) Individual action

Table 10.3-3 Individual action image of supporting manual

<table>
<tr>
<td rowspan="2">To explain detail action, with tables, photo, image figure, etc.
e.g.: Procurement of Do-nou bags
 

- Use 45cm x 60cm gunny bag
- Tie Do-nou bag tightly with 45cm from the bottom of bag even if your bag size is different.</td>
<td>WRMA’s part
- To introduce CORE as one of adviser
- To show regular type Do-nou bag as a sample</td>
</tr>
<tr>
<td>WRUA’s part
- To check the price of Do-nou bag at local shop.
- To ask community the possibilities of getting Do-nou bags by themselves
- To gather Do-nou bags from community
- To check quality of Do-nou bags gathered</td>
</tr>
</table>

10.4 Activity manual for community based disaster management (structural)

Protection measure of river bank against erosion in Isiolo and construction of evacuation center, raised toilet, and evacuation road in Lower Lumi are implemented in this project. In above measurements, manuals for activities conducted by local residents and WRUA are developed for further community based disaster management activity.

Manual for community activity has five components as fig. 10.4-1.

Plastic coated paper is better for actual usage at work place, but printing/distribution with normal paper was selected in this project considering with cost. Furthermore, manual was made in English, but translation to local language is much better for local residents' participation.

Fig. 10.4-1 Component of activity manual

1	Things you'll need
2	Instructions
3	Observation
4	Maintenance
5	Contact addresses for supporting

10.4.1 River Bank protection

Activity WRUA and community participated was making gabion wall in Isiolo, and the components of activity manual are as in Table 10.4.1.

Table 10.4-1 Component of gabion wall

1	Necessary tools	
2	Instruction	
	1	Making Gabion Baskets
	2	Choosing and gathering boulders
	3	Place Gabion box and fill with boulders
	4	Fix Gabion box and connect each other
	5	Sodding
3	Maintenance	
	1	Regularly check the gabion boxes and fix any torn/cut gabion net
	2	Tools for maintenance
	3	Material for back fill settle down
4	Observation	
	1	After high water level
	2	Before rainy season
5	Contact addresses for supporting	

The meeting to explain to local residents was held as per the photo 10.4-1. Activity is explained with manual paper before action, and then residents implemented filling with boulders and fixing gabion box.

Photo 10.4-1 Briefing with manual and making gabion wall

10.4.2 Evacuation centre, raised toilet, raised evacuation road

Activity WRUA and community participated was making raised evacuation road in Lower Lumi, and the components of activity manual is as following.

Table 10.4-2 Component of Raised Evacuation road

1	Necessary tools		
2	Instruction		
		1	Preparing Do-nou bags
		2	Putting murram into Do-nou bag using half cut Containers
		3	Preparation the place
		4	Filling Do-nou
		5	Simplified Cross-section of Do-nou raised road
		6	Compaction and fill space
		7	Check angle
3	Observation		
		1	Shapes: any damages, survivals
		2	Exposed Do-nou bags
		3	Sunken road profile
4	Maintenance		
		1	Lay the additional layer of Do-nou
		2	Cover the top layer of Do-nou with murram
		3	Compact the murrm
5	Contact addresses for supporting		

10.5 Activity manual for community based disaster management (non-structural)

The manuals of Flood Early Warning System (FEWS), Disaster Education, and Evacuation Drill are developed to support community based disaster management activities (non-structural).

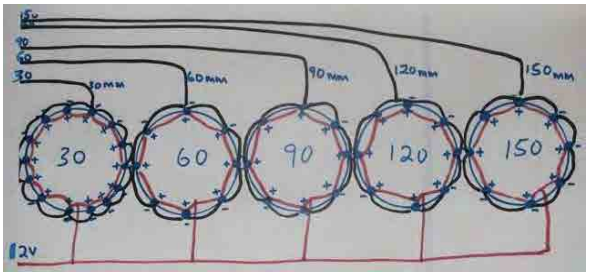
10.5.1 Flood Early warning system

Activity manual for installation and operation of flood early warning system with simplified rain gauge and river gauge conducted by Japanese experts in this project was developed for further expansion to other areas in Kenya. The component of manual is as follows.

Table 10.5-1 Component of Flood Early Warning System

1	Manufacturing and installation
2	Operation and Maintenance
3	Warning Standard

The original manual had been made by many experiences in other countries, and available parts in Kenya are studied in collaboration with KRCS volunteer, thus steps including Kenyan original warning sign are developed.



Total view

Photo 10.5-1 Plan and Real Rainfall Display Unit

10.5.2 Disaster education

Based on the Flood Management Textbook for Primary Pupils developed under the Nyando project, Disaster Education Manual was re-arranged and customized for LOGUMI SC. The component of the manual are as follows.

Table 10.5-2 Component of Disaster Education

1	Background of floods (the mechanism of occurring floods, relative organizations, type, causes, effects, and history of flood)
2	Flood hazard (back ground of sub-catchment, mechanism of floods, countermeasures against floods, and impacts of flood)
3	Flood Safety Measures at Household
4	Flood Safety Measures in School
5	Flood Early Warning System
6	Common Diseases during flood season
7	School Flood Safety Program
8	First Aid

10.5.3 Evacuation drill

Based on the evacuation drill manual developed under the Nyando project, Evacuation Drill Manual is re-arranged and customized for LOGUMI SC. The component of the manual is as

follows.

Table. 10.5-3 Component of Evacuation Drill

1	Preparatory	
2	Execution of Evacuation Drill	
	1	Commencement of Drill
	2	Causing alert by use of megaphones
	3	Evacuation of community members to evacuation centre
	4	Dissemination of Information for External Assistance
	5	Settling of Evacuees at the Evacuation Centre
	6	First Aid Demonstration
	7	Evaluation and Assessment of Flood Damage
	8	Wrap Up Meeting

10.6 Lessons learnt of community based disaster management

Lessons Learnt based on the community based disaster management activities in this Project was developed for purposes of it being used as the reference material as flood management is expanded to other areas in Kenya. The reports of past activities are not cohesive and even inaccessible for utilization, necessary items and format are discussed in this Project. And based on ADRC Good Practices[1], the component of manual is as follows.

Table 10.6-1 Component of Lessons Learnt

1			Background and Objectives
2			Case Study
	1		The profile of Sub-catchmen
	2		Objective
	3		Summary
	4		Good points
	5		Contributions of local community
	6		Challenges
	7		Duration
	8		Related organizations
	9		Budget
	10		Contacts
3			Lessons Learnt
	1		Introduction
	2		Lessons Learnt
		1	Pre-construction stage (decision-making, bidding, contract, planning)
		2	Construction stage (Monitoring)
		3	Completion of Construction stage (Inspection, O&M)

ADRC good practice is appropriate for reference of case study; however this Project recognized the need for more information on the lessons learnt. Therefore, this booklet has two parts, one is for case study, and the other is lessons learnt.

Image photo and map is laid out in the first part as introduction of case study, also Project image is set for easy understanding.

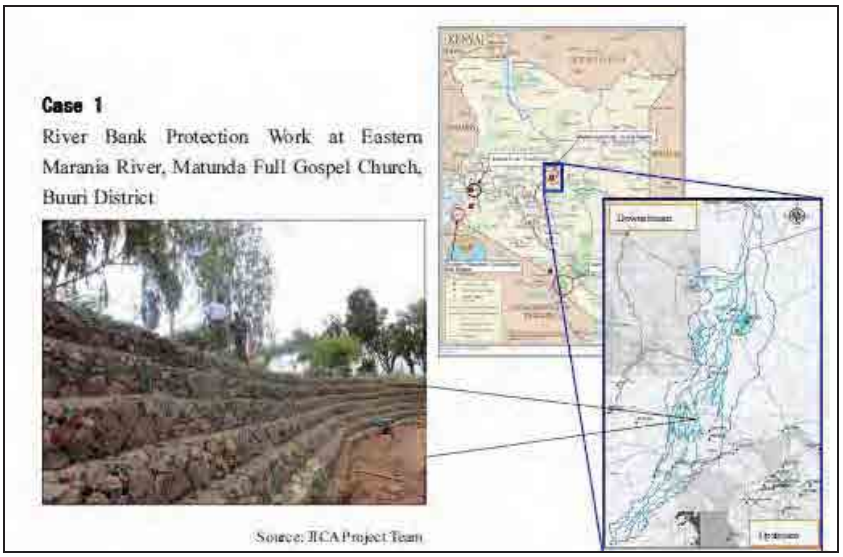


Fig. 10.6-1 Introduction of river bank protection in Isiolo

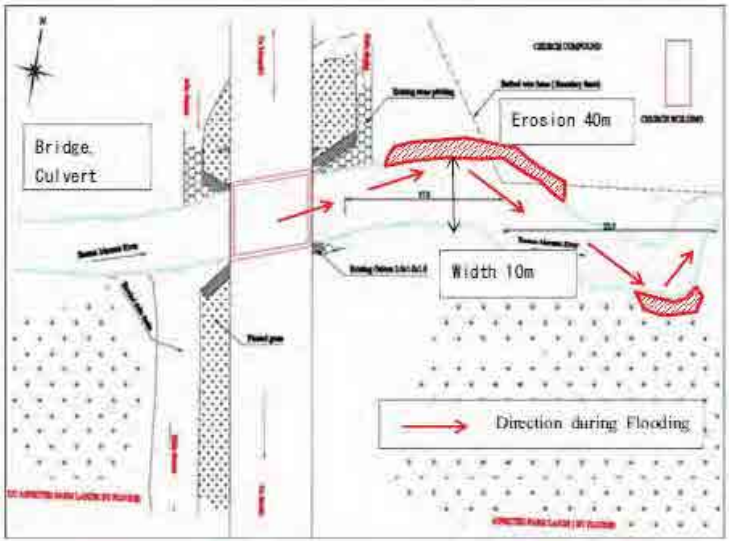
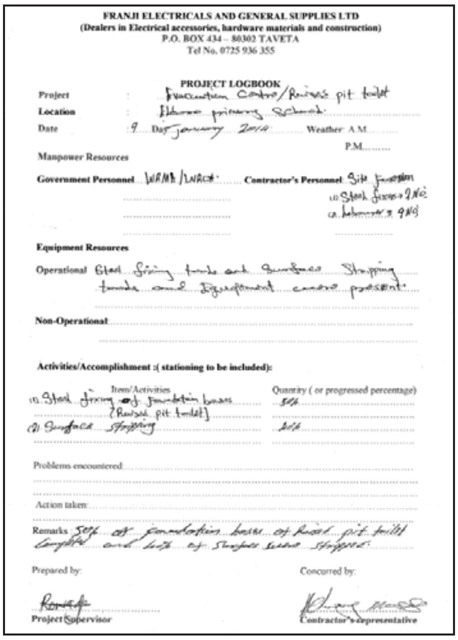


Fig. 10.6-2 Image of river bank protection measures in Isiolo

To grasp lessons learnt, the contractor was requested to develop logbook and thus the implemented activity and challenges could be share. By utilization of Project logbook, challenges could easily be solved by Project Manager (SRM in this Project). But logbook was not shared as soon as it was required and therefore it should be modified. Furthermore, writing style such as following example is difficult for sharing, so block style writing is strongly recommended.



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Tel No. 0725 936 355

PROJECT LOGBOOK

Project :
Location :
Date : Day Weather: A.M. .... P.M. ....

Manpower Resources

Government Personnel .... **Contractor's Personnel** ....

Equipment Resources

Operational ....

Non-Operational ....

Activities/Accomplishment :(stationing to be included):

Item/Activities	Quantity (or progressed percentage)

Problems encountered: ....

Action taken: ....

Remarks: ....

Prepared by: .... Project Supervisor

Concurred by: .... Contractor's representative

Fig. 10.6-3 Example of activity logbook

10.6.1 River bank protection work in ISIOLO

The specific points of community based disaster management activity in Isiolo are the possible community maintenance method for gabions, and implementation of O&M training. Photo 10.6-1 shows O&M training.

Photo 10.6-1 River bank protection work in Isiolo with community participation

Challenges are written in the part of case study, and explained in detailed in the part two: lessons learnt.

Challenges in case of Isiolo are selection of contractor, gathering boulders as community contribution, and dysfunction of monitoring committee.

Check points for selection of contractor, frequency community meetings to explain direct benefit to community, and assignment nearby residents as a member of monitoring committee are recommended.

10.6.2 Evacuation facilities in LOWER LUMI

The specific points of community based disaster management activity in Lower Lumi are the possible community maintenance/further civil works method of Do-nou technology and the participation in the Do-nou technology training course conducted by CORE that made the trainees to be the leaders of community contribution work. Photo 1.6-2 shows community members constructing a raised evacuation road. Do-nou technology is not only for evacuation road construction, but also improvement of road condition within the homesteads and also for development of embankment. It is possible to get direct benefit by accepting small scale civil works, so community members was highly motivated.

Challenges encountered are explained in the first part: case study, and detailed explanation second part: lessons learnt.

Challenges in the case of Lower Lumi were mainly financial issue such as guarantee for advanced payment, and lack of do-nou bags/murrams due to changing toilet construction site.

So the necessity of confirmation for the past experiences scale, and confirmation of detail drawing with stakeholders are recommended.

Photo 10.6-2 Evacuation road by Do-nou

10.6.3 Lower Gucha Migori WRUA

The specific points of community based disaster management activity in LOGUMI are as follows:

(1) With experience of exchange visit to Nyando, LOGUMI WRUA proposed World Vision and even influenced the change of design of toilet from the initial not raised up toilet to raise above flood depth toilet.

(2) CFMOs are established in LOGUMI SC under LOGUMI WRUA after the experience accrued from exchange visit to Nyando.

(3) Exchanging visit between community members from upstream and community members from the downstream, in effort to sensitize community members in the river basin on importance of observation of rainfall and river for purposes of flood early warning system.

(4) Development of proposal for fund-raising

(1) to (3) are the successful outcome based on exchange visit, especially (1) and (2) are the successful outcome from leading Nyando project as shown in Photo 10.6-3. LOGUMI WRUA utilized opportunities such as exchange visit and training course in Japan for capacity development on disaster management.

Project Team also enlightened LOGUMI WRUA on developing proposals for fund-raising. LOGUMI WRUA are sensitized on the possibility of accessing funds from donors.

Raised borehole

Disaster Education

Raised evacuation center

Signboard of flood hazard map

Photo 10.6-3 Exchange Visit in Nyando

Challenges are written in the first part: case study, and are explained in details in the second part: lessons learnt.

Chapter 11 Community Participatory Approach on Flood Management

In this section following items are discussed as the ideal community participatory approach on flood management;

- Relationship between community and WRUA
- Expected abilities/functions in each actors
- Challenges and measures on community based flood management in Kenya

11.1 Relationship between Community and WRUA

(1) Definition of community by JICA

"Community Based Disaster Management from the Capacity Development point of view" (JICA 2008) defines Community and Community Based Disaster Management are defined as follows:

Community is generally defined as "group of people having the same interests and values". Referring the existing definition of community, community and community based disaster management is defined as follows in this report.

■What is community?
Organization that consists of members who has solidarity and a sense of belonging, with loyalty to fulfill responsibility for the accomplishment of needs of each other.
The unit of community is local residential unit, it is closer to resident than minimum administrative unit, and the unit can play function as mutual assistance.

■What is community based disaster management
The disaster management approach to focus community's disaster management capacity development, no limited to emergency response and recovery of preset disaster management by top-down type governmental disaster management, but within the stream of focusing disaster prevention, and effectively distribution of limited resources from local society and government, also focusing disaster reduction and mutual assistance in neighboring community that focuses to exert the effect of local development disaster capacity development from the point view of humane insight and intrinsic development effort.

(2) Definition of WRUA

WRUA is defined as follows as per Water Resources Management Rules 2007 developed by the MWI (current MEWNR).

A WRUA is an association of water users, riparian land owners, or other stakeholders who have formally and voluntarily associated for the purposes of cooperatively sharing, managing and conserving a common water resource.

And the following three key features of this definition in WDC Manual are:

- Membership to the WRUA is voluntary;
- The WRUA is a membership organization, not a service organization, and therefore is

empowered through the participation of its membership;

- Eligibility for membership derives from one's relationship to a common water resource, either as a water user, a riparian land owner or a stakeholder;

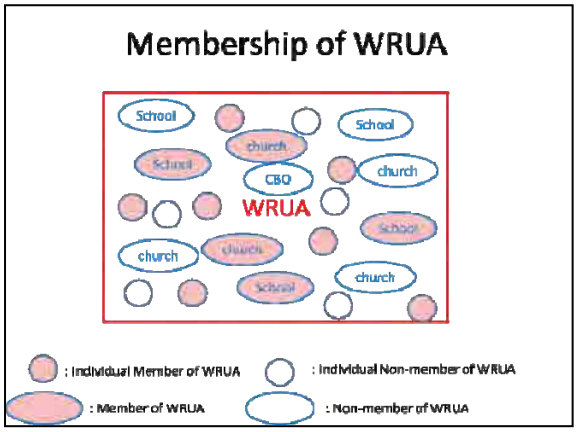
The WRUA as recognized in the Water Act 2002 represent community-based organizations that come together around specified water resources for cooperative management and conflict resolution. This could be formed around a lake water resource, a defined ground water aquifer, a spring or a river. Water users include farmers, domestic users, water projects, water service providers,' commercial water users, industrialist and the like. The membership of the WRUA is based on voluntary agreement between members. The Water Resource User Association is a model for community-based participation in water resource management. (Extracted from the WDC Manual Ver. 2)

And more, in the WDC Manual Ver.2 , the objectives of a WRUA include flood management as follows:

- Promote controlled and legal water use activities;
- Promote good management practices to make efficient and sustainable use of the water resource;
- Promote water conservation practices to ensure sufficient water reserves that meet the demands of the environment, the wildlife, the livestock and all the downstream communities who rely on the water resource;
- To work towards reducing conflict in use of the water resource and participate in solving those that arise;
- Promote catchment conservation measures to improve water quantities and quality;
- Supporting members to engage in income generating activities (IGAs);
- Building adaptive capacity of the community to impacts of climate change;
- Mainstreaming flood management in SCMP activities;

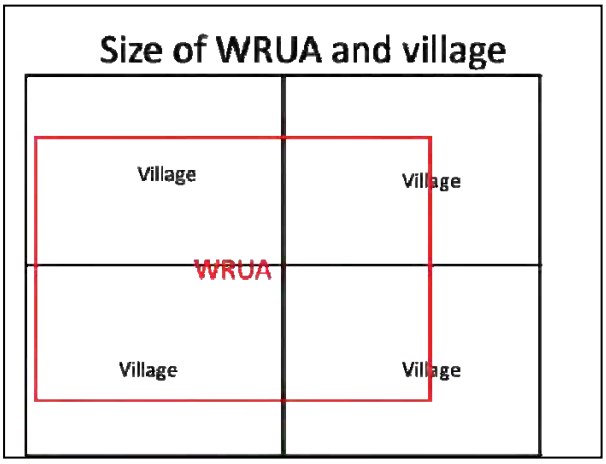
Membership of a WRUA should comprise of following categories, namely:

i. Riparian Members;
ii. Abstractor Members;
iii. Non-consumptive Members;
iv. Observer Members.
v. CBOs and SHGs



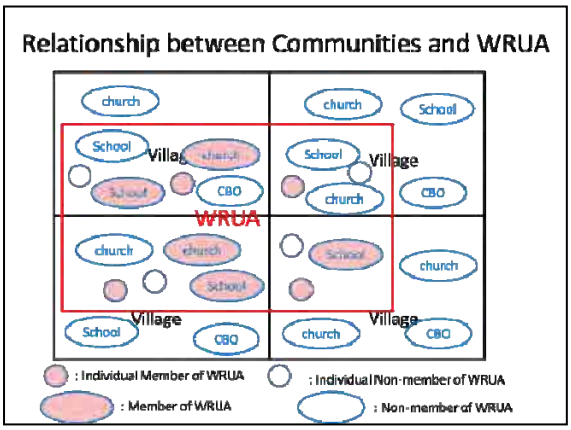
These include not only individuals, but also water projects or schemes for serving many households, Community-Based Organizations (CBOs) and Self Help Groups (SHGs) such as school Parent

Teachers Associations (PTAs) and church communities. These groups basically consist of individuals who live at around the particular areas and form communities from the local relationship.



With regard to the coverage and geographical extent of a WRUA, for a river water resource, it is recommended that WRUA be formed at the sub-catchment level. Due to the complexity of the drainage system it is recognized that this is an area where guidance and consultation is required specifically with WRMA. Following this, WRMA has delineated sub catchments according to the drainage pattern countrywide. A map showing the coverage of existing and potential WRUAs has been developed and is available at all WRMA offices. Consequently, the coverage and geographical extent of a WRUA, which is a sub catchment, covers plural villages.

Based on the above mentioned information, a WRUA covers plural villages in geographically. And a WRUA consists of residents in those villages, influential persons who nominated by the residents, CBOs and SHGs such as schools and churches as shown in the right figure.



(3) Main actor of community based flood management in Kenya

Based on the above, the Project Team analyzed the definition of community by JICA, actual situation of villages/CFMOs and WRUAs in Kenya and summarized them in the following table. However, this issue has not been discussed with the C/Ps.

Table 11.1-1 Comparison of definitions of Community by JICA, Villages/CFMOs and WRUAs

	Definition of Community in "Community Based Disaster Management from the Capacity Development point of view (JICA 2008)"	Villages/CFMOs	WRUAs
Interests and values	Sharing the same interests and values	Sharing the same interests and values on flood damage	Sharing the same interests and values on water use. Sometimes there are different interests and values on flood damage, because some areas are affected by floods and other areas are not.
Solidarity and sense of belonging	Strong	Strong at the village level	Strong in water use There are differences in flood by areas
Common needs	Exist	Exist	Exist
Loyalty	Exist	Exist	Exist
Unit of community	Neighboring residents	Village level (Members can congregate by foot.) Villagers are the members	Several villages are covered. (Members cannot congregate by foot.) Not only individuals, but also CBOs/ SHGs consisting of neighboring residents are the members.
Function as mutual assistance	Exist	Exist	Exist
Sustainability in finance	---	Maintenance cost can be covered by income from utilization of installed facilities. External fund from national funds such as CDF and from international donors such as grass root aid of Japan can be utilized.	WSTF in WDC can be utilized for activity cost.
Nationwide expansion of community based flood management activities	---	Cooperation with WRMA as a nationwide institution is weak. There is a possibility that WRUA will have cooperative relationship with other national institutions.	Cooperation with WRMA as a nationwide institution is strong. Therefore, extension to nationwide is possible.

In contrast with the definition of community by JICA, there are such differences that WRUAs have some differences in the interests and values of floods and a geographical extent of WRUA as a unit of community covers several villages. However, WRUAs can get fund from WSTF therefore they have high sustainability in finance for activity cost. Moreover, community based flood management activities by WRUAs will be able to expand nationwide through WRMA. For these reasons, in the Project, WRUAs and villages, Parents Teachers Associations (PTAs), School Management Committees (SMCs) and groups of church members located in particular WRUAs were regarded as communities against floods and main actors for community based flood management. And, community based flood management activities were conducted with them.

On the other hand, in the field of flood management, WRUA's roll in Kenya was judged as extremely important for the following reasons;

- It is difficult to take measures against floods in small areas. Because water flows form higher places to lower places, cooperation between upstream and downstream communities is important. Therefore, entities which have powers to lead several communities are necessary.

- Activities by single community need not only long-lasting strong leadership and support in finance, but also existence of organization which provides guidance in operation and technical support.

(4) Selection process of project target areas

In the selection process of project target areas, there are two methods such as utilizing WRUAs and utilizing the line of administration units, locations, sub-locations and villages without WRUAs. The following is a summary of the discussion among the counterpart officer of the MEWNR, the Project's community based flood management activity supervisor and the Project Team.

In the method to utilize WRUA a process of selecting project target areas should be discussed in the Annual General Meeting (AGM) of WRUA which WRUA members attend and the decision should be made by majority. In AGM, usually not only flood issues, but also water use issues will be discussed. Therefore, if there are flood affected areas and not flood affected areas in the WRUA's coverage area, water scarcity problem which is considered as daily problem may be considered priority and flood problem may not be discussed fully. Priority of flood countermeasures may be lowered and its implementation may be delayed.

On the other hand, in the method to utilize the line of administration units, locations, sub-locations and villages, a location public meeting which is called a "baraza" in Swahili should handle this issue. There are location-level public meetings participated by village elders and sub-location –level public meetings chaired by chief or assistant chief. During a public meeting the communities represented will be able to explain flood conditions in their area and identify the most affected area based on the depth of flood inundation, the duration of such floods in the area and whether the communities affected are receiving relief aid. Based on such information the most affected village can be selected by consensus during the location public meeting. In this way, flood issues are discussed without being less prioritized or neglected.

Among these two methods, in view of effectiveness in ensuring community contribution to a project such as provision of labor of residents, public meeting at the location level or sub-location level is more advantageous than WRUA at this moment. It is because village elder is likely to attend public meeting and he/she has big influence in his/her village and is respected highly. Therefore, there is a high possibility that decision made by the village elder will be realized by the village residents.

11.2 Expected abilities/functions in each actors

Relationship of each actor for community based flood management is as follows.

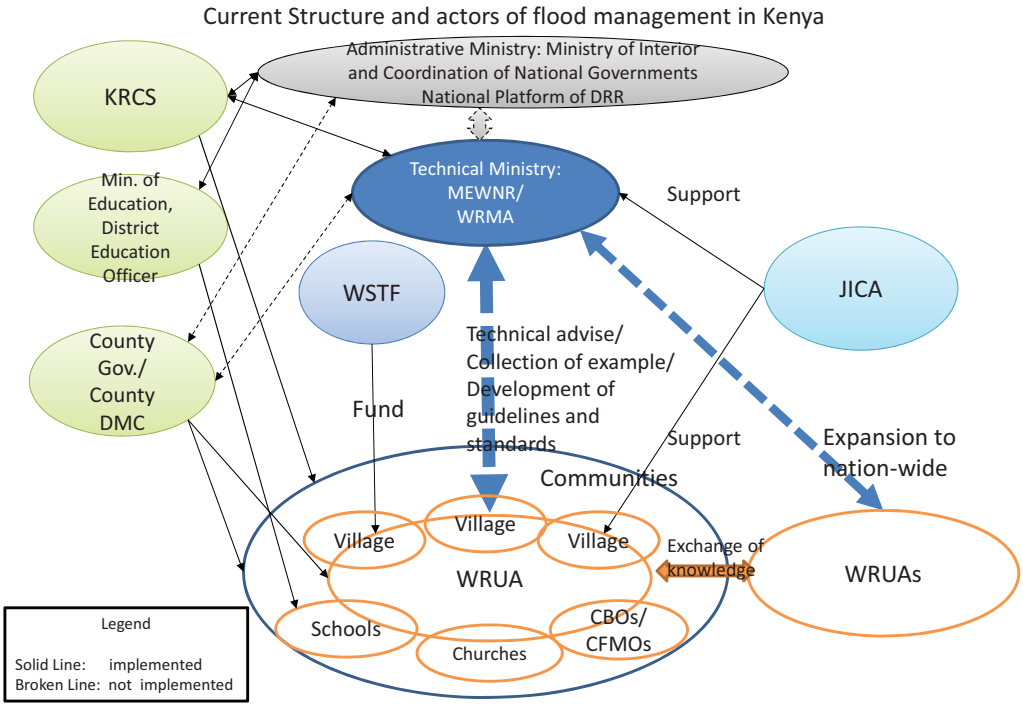


Fig. 11.2-1 Relationship of each actors in this project

In the "Community Based Disaster Management from the Capacity Development point of view" (JICA、2008), the key drivers to promote capacity development of community based disaster management as follows:

1) Knowledge of Disaster Management and Risk Awareness, Disaster Management Technology, and Resource,
2) Preferred Organizational Environment (Leadership, Ownership, Incentive),
3) Preferred Society, System, Imperative environment.

According to above mentioned three key drivers, expected capacities and functions in each actors are rearranged as follows.

Main Actor: WRUA

Key Drivers	Expected Capacities and Functions
Knowledge, Technology, Resource	To grasp current status of flood damage in their area. To have knowledge about flood disaster To make community based flood disaster management plan. To incorporate flood disaster management plan into SCMP. To implement small scale structure for flood management measure and the non-structural measures such as establishment of early warning system and evacuation drill.
Preferred Organizational Environment (leadership, ownership, incentive)	To cooperate and to coordinate with local stakeholders. To raise necessary fund to implement flood management activity from WSTF and other donors.
Preferred Society, System, imperative environment	

Supporting Actor: Technical Authority (MEWNR/ WRMA)

Key Drivers	Expected Capacities and Functions
Knowledge, Technology, Resource	To have enough knowledge of flood disaster management To conduct gathering and analyzing disaster information while coaching and cooperating with WRUA. To make flood management plan To make standard act and manual of flood management. To coach flood management measure conducted by WRUA and county government.
Preferred Organizational Environment (leadership, ownership, incentive)	To cooperate and coordinate with stakeholders. To gather conducted flood management measure example. To expand flood management measure to nation-wide.
Preferred Society, System, imperative environment	

Supporting Actor: Administrative authority (Ministry of Interior)

Key Drivers	Expected Capacities and Functions
Knowledge, Technology, Resource	
Preferred Organizational Environment (leadership, ownership, incentive)	To manage national disaster management platform appropriately. To cooperate and coordinate with related ministry and county government
Preferred Society, System, imperative environment	To make national disaster management policy and disaster management law To expand community based disaster management to nation-wide

Supporting Actor: Local administration (County Government)

Key Drivers	Expected Capacities and Functions
Knowledge, Technology, Resource	To conduct structural/non-structural flood disaster management measure.
Preferred Organizational Environment (leadership, ownership, incentive)	To make disaster management strategy and disaster management plan as county. To support financial cooperation to flood management measure conducted by WRUA, School , Church, CBO/CFMO, and residents.
Preferred Society, System, imperative environment	

11.2.1 Challenges and measures on community based flood management in Kenya

(1) **Challenges**

The remaining challenges and improved problem-solving capacities in this Project are rearranged with three key drivers as follows:

Table 11.2-1 Main Improved Capacities in this Project and Remaining Challenges

Key Drivers	Main Capacities and remained challenges
Knowledge, Technology, Resource	Knowledge of flood disaster management such as mechanism, past events, corresponding situation, and countermeasures are transferred, so CD in WRMA staffs are done. The training course of flood management for WRMA staff is established. Trial of WRUA's flood management training course conducted by WRMA staffs, and establishment of training system. Flood hazard map was developed Disaster education was conducted at school. Community based flood early warning system were developed, installed, and operated. Structural measures of community participatory disaster management facilities such as evacuation center, evacuation road, and river bank protection wall were constructed. Integrated Flood Management Plans were developed. Integrated Flood Management Committees were established. WRUA conducted efforts for raising Fund from raising from WSTF and other donors.
	Challenges: Water resource is high priority than disaster management when WRUA has a meeting for prioritization. Flood management training course to most of WWRUA was not conducted.
Preferred Organizational Environment (leadership, ownership, incentive)	Relationship between WRUA and WRMA is strengthened. Flood Management Department (FMD) and staffs are allocated in WRMA. Flood Management Sub-committee and CFMO are allocated in WRUA FMO of WRMA took the initiative for flood management. Leadership, initiative, and incentive of WRMA DTMO are increased. Leadership, initiative, and incentive of WRUA Chairman and secretary are increased. Cooperation of WRUAs is strengthened. Cooperation between WRMA and KRCS Possibly of cooperation between WRMA and Ministry of Interior is generating. Possibly of cooperation between WRMA and County government is generating.
	Challenges: Cooperation between Ministry of Interior, County government and WRMA is not enough. The promotion of framework of WRUA flood management sub-committee and CFMO is not enough.
Preferred Society, System, imperative environment	Flood Management is included to NWRMS, CMS, and WRMA Strategic Plan. Installation of Integrated Flood Management Model such as IFMC and IFMP Development of Manual on supporting community-based flood

	management activities and Manuals on community-based flood management activities.
	Challenges: National disaster management policy and disaster management law are not established. WRMA is not participated in National Disaster Management Platform. WRMA is not participated in County Disaster Management Committee.

(1) Measures

Considering the above mentioned challenges, the reasons and measures are analyzed as follows:

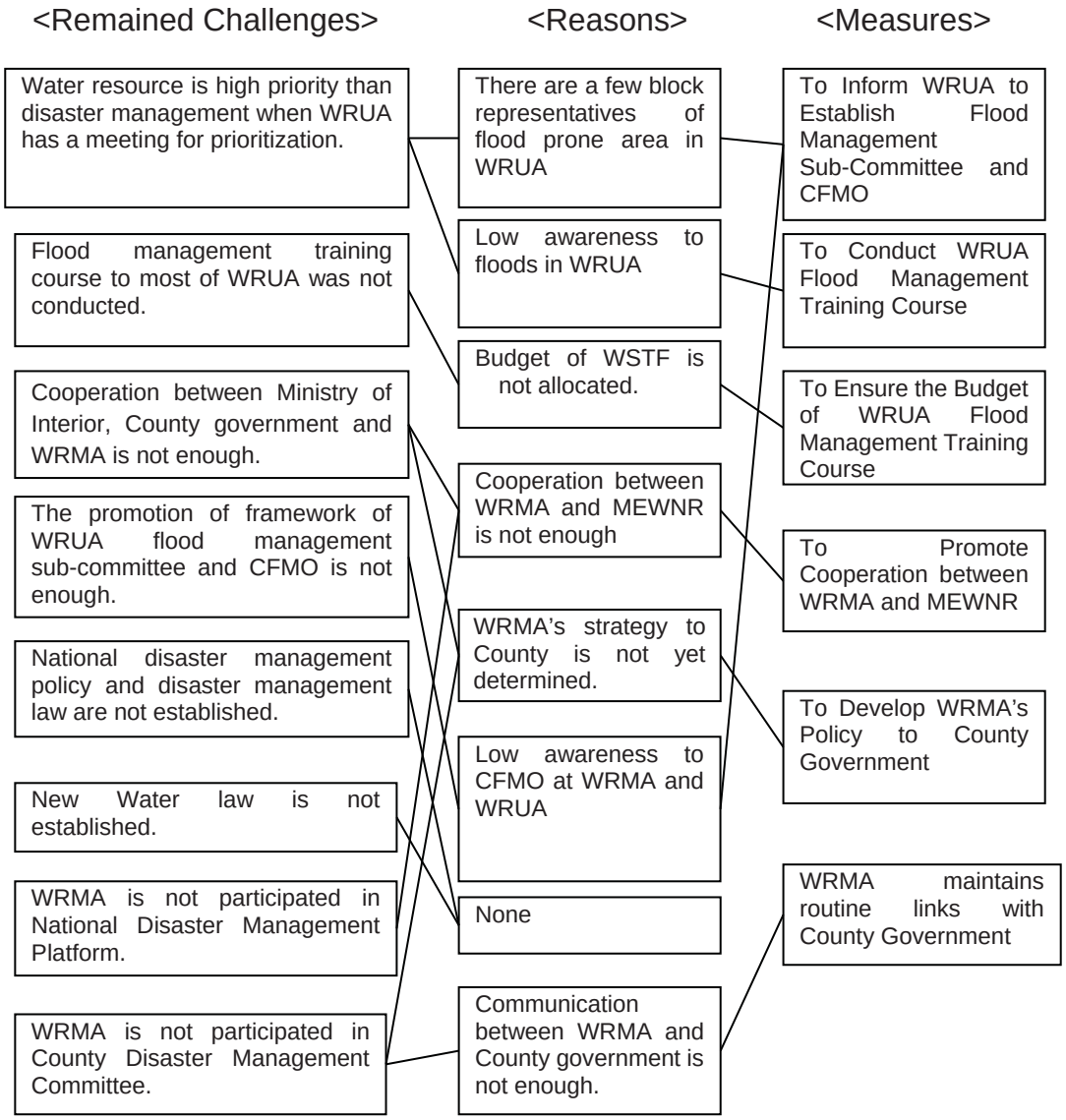


Fig. 11.2-2 Measures to the remaining challenges

The following measures can be considered in order to promote community based disaster

management activities by WRMA:

1) To Inform WRUA to Establish Flood Management Sub-Committee and CFMO
2) To Conduct WRUA Flood Management Training Course
3) To Ensure the Budget of WRUA Flood Management Training Course
4) To Promote Cooperation between WRMA and MEWNR
5) To Develop WRMA's Policy to County Government
6) To maintain routine links with County Government

1) To Inform WRUA to Establish Flood Management Sub-Committee and CFMO

The present decision-making was conducted at the meeting with committee members and block representatives as follows. According to establish the Flood Management Sub-committee and CFMO under WRUA, the member of Flood Management Sub-committee and CFMO representatives also can participate decision-making meeting.

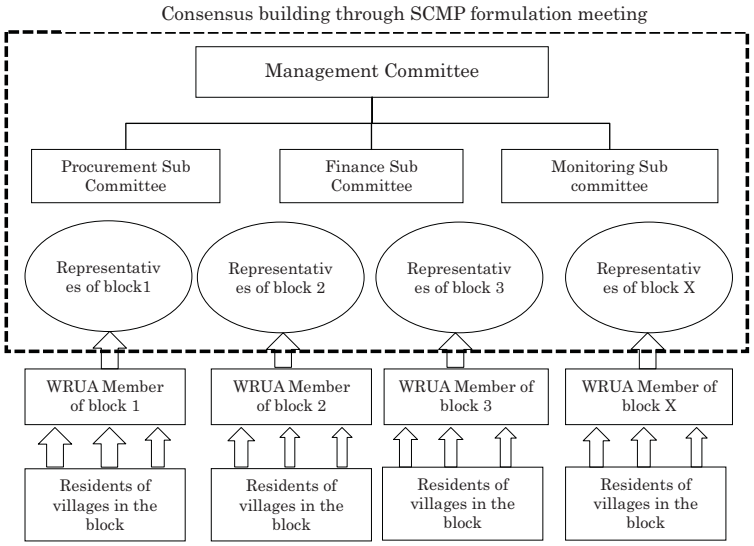


Fig. 11.2-3 Present framework of WRUA

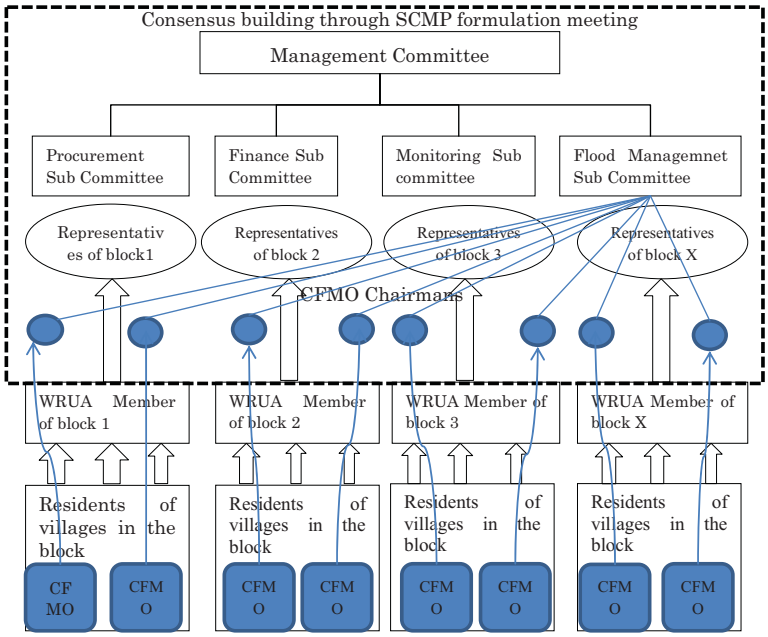


Fig. 11.2-4 WRUA framework including Flood Management Sub Committee and CFMO

2) To Conduct WRUA Flood Management Training Course

By having the flood management training course in this project, LOGUMI WRUA members' awareness was successfully increased, and they realized the importance of disaster prevention as well as response. Therefore, it is considerable that the priority of flood management could be higher after implementation of WRUA flood management training course.

3) To Ensure the Budget of WRUA Flood Management Training Course

Budget allocation is necessary to implement WRUA flood management training course. WRMA explained that the budget for flood training course was ensured at WRUA already made SCMP according to revision of WDC manual, it should be confirmed.

4) To Promote Cooperation between WRMA and MEWNR

It's not realistic at Kenyan customary for WRMA to cooperate other ministry/agency without NEWNR. Therefore the effort to promote cooperation between WRMA and NEWNR is necessary. However there is no definite plan, it should be discussed.

5) To Develop WRMA's Policy to County Government

It's very confusing without strategy how to cooperate and coordinate between WRMA and county government. PROJECT TEAM assumes it is possible that WRMA leads county as regulatory agency, and county conducts actual tasks.

6) To maintain routine links with County Government

To conduct 5), WRMA needs more information gathering and exchange opinions, therefore WRMA should keep routine links with county government.

Chapter 12 Feedback from the cases and the lessons of the community based activities to the knowledge management mechanism

"Knowledge management system" developed in this Project made an accumulation scheme in Headquarters of the information gotten through the flood related activities that were mainly done by WRMA.
On the other hand, many lessons learnt can be led by implementation of community based disaster prevention activities. These lessons learnt should be included into "Knowledge management system" and feedback toward the next activities. In this chapter, it explains the making of the scheme of feedback.

12.1 Community based disaster management activities implemented in this project

Community based disaster management activities implemented in this project can be summarized as shown below.

Table 12.1-1 Community based disaster management activities

	Activity Site	Community based disaster management activities	Activity contents
Structural measures	Isiolo Sub-catchment	Boulder Collection	Community members attribute to the flood measures by collecting polders to be enclosed into gabions.
	Lumi Sub-catchment	Roads raising by Do-nou method	Community members implement the flood measures by enclosing soils into Sand-bags, raising the roads and compaction as the activities of self-help and mutual assistance.
Non-structural measures	Kenya	FEWS (Famine Early Warning System)	Timely evacuation warning will be done by observing the water level in upstream, rainfall and lead time in flood situation.
	Gucha Migori Sub-catchment	Evacuation drill	Implementation of training drill for deciding the appropriate procedures and evacuation routes assuming flood case.
	Gucha Migori Sub-catchment	Disaster prevention education	Enhancing the consciousness of disaster prevention even in a normal period, in order to behave the efficient and emergency measures when flood comes.

In order to accumulate the lessons learnt from these activities, it will be necessary to build this community based disaster prevention activities in this scheme of knowledge integration as mentioned in "Part 2 Chapter 6".

12.2 Feedback of lessons learnt obtained from activities in this project to knowledge management system

In order to feed lessons learnt obtained from activities in this Project into Knowledge management system, there are mainly 3 types of implementation method and they are shown below:

12.3 Reporting of lessons learnt and including to knowledge system

The records and results of the extracting process of lessons learnt from community based

disaster prevention activities are described in the report. And then, the records and results are shared by embedding in the information transmission flow established through the knowledge management system that was mentioned in the "Part2 Chapter 6". And also the records and results are described in "Knowledge system" as the documents.

12.4 Sharing of lessons learnt from workshop and Inclusiveness of meeting log

The workshop that will be an opportunity for discussing about the extraction process of lessons learnt led from the activity report and the analysis, and also the members will be able to share the lesson learnt. The record of the workshop will be described by SRO that is the organizer, and it will be shared in the information transmission flow, then it will be included in the "Knowledge system" as a document.

12.5 Sharing of lessons learnt from IFMC meetings and inclusiveness of meeting log

In IFMC meeting held regularly, the analysis of community based disaster prevention and lessons learnt extracted through the analysis will be presented and those will be shared by the participants. The record of the meeting will be described by SRO that is an organizer, and it will be shared in the information transmission flow, then it will be included in the "Knowledge system" as a document.

The information transmission flow of flood management is shown below.

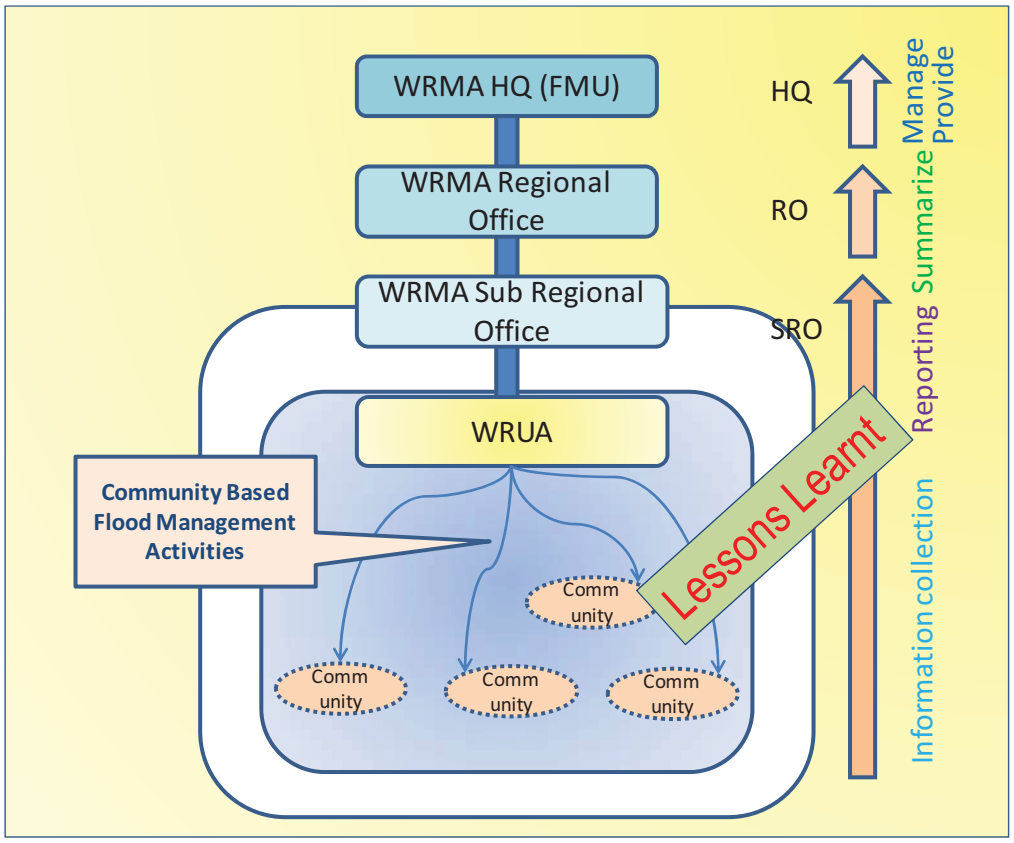


Fig 12.5-1 The information transmission flow of flood management

12.6 Feedback of lessons learnt obtained from future community based disaster prevention activities to knowledge management system

WRMA and the Project Team considered the way of feedback lessons learnt obtained from future community based disaster prevention activities to the scheme of knowledge management system after this Project.

The information flow concerning the sharing of lessons learnt.

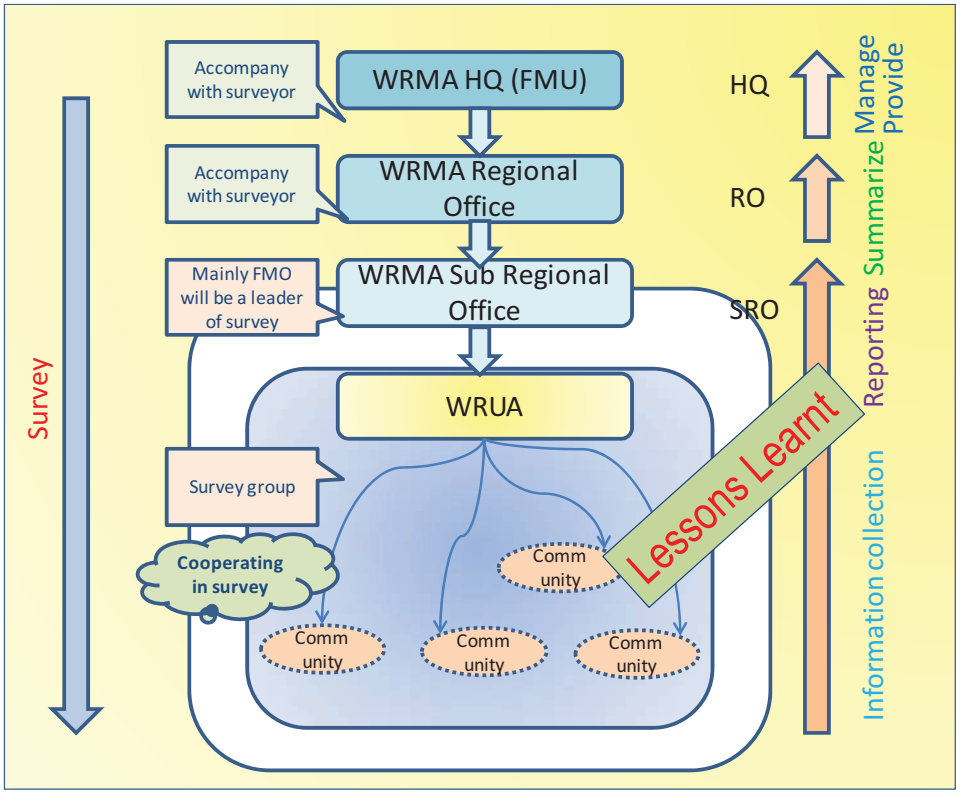


Fig. 12.6-1 The information flow concerning the share of lessons learnt obtained

Based on the figure 11.6-1, WRMA SRO, RO and HQ can share lessons learnt by extracting from the activity of information collection in the same manner as the flood situation survey, and making the report of this situation.

First of all, it is necessary to survey the situation of community based disaster prevention activities undertaken mainly by FMO who belong to SRO. And for this survey, it is required that questionnaire sheet be prepared in order to accumulate lessons learnt.

The draft questionnaire sheet for accumulation of lessons learnt is as shown below.

Name of activity for community based disaster prevention：		
Structural・Non-structural	Total number of participants：	
Date：mm/dd – mm/dd	Reporter：	
Region：	Affiliation：	
Outline of activity：		
Interview results： *The content of the interview free description the improvement, goodness, no improvement, and badness after the activity. However, it follows Bullet like below.* ・ Improvement and Goodness ・No improvement, badness and failure *（use for lessons）*		
Lessons： Discuss in WRMA and point lessons learnt out, and then describe as bullet point. ・*Check of the power supply FEWS is not neglected. -No alarm at heavy rain, because the battery was dead.-* ・ ・		
Keywords： Expecting words to the future lessons are registered（qte）		

Isiolo	*FEWS*	*Power*	*Solar*
Battery	*Heavy rain*	*Alert*	*Failure*
preparation			

Fig. 12.6-2 Questionnaire sheet to accumulate lessons learnt - Draft -

The procedure of transferring of feedback lessons learnt to knowledge management system is shown as follows:

1) WRMA and WRUA interview to the local residents
   By using the questionnaire sheet as mentioned above, WRMA and WRUA interview to community members concerning the activities. In this interview, WRMA and WRUA will ask the affairs improved or not improved, good matters or bad matters and reflection points after the activities. After this interview, and record them.

2) Based on this result, WRMA SRO members will draft the findings what is to say as lessons learnt
   According to the result obtained on the questionnaire, SRO member will discuss and summarize lessons learnt and make the report. The report will be sent to RO as an electronic file. RO member will investigate the validity of the report. And then if there are some problems, RO member will modify.

3) Report subscription to WRMA Headquarter and uploading on the bulletin board system by ICT officer after confirmation FMU member will investigate the report sent from RO. After that, FMU will order ICT to upload it on the bulletin board system build on WRMA Website.

4) Sharing lessons learnt by downloading the report from the bulletin board system WRMA staff can download the target report within the reports uploaded on WRMA Website by ICT. On the screen of the bulletin board system, each screen will be made by target sub-catchments, and then titles are shown by time order for user's ease.

12.7 The focal point in feedback of lessons learnt to knowledge management

In order to transfer feedback lessons learnt obtained from community based disaster prevention activities to knowledge management system successfully, it will be important to establish the operation model to be able to comprehend information of each of the activity, the working customs to be able to extract lessons learnt from information of each activity. And also, it will be important to accumulate lessons learnt by summarizing and making the report.

Based on this therefore, if the scheme of making the report will be established, it will be expected that there be accumulation and effective use of lessons learnt.

PART IV

COMMON PROJECT ACTIVITIES FOR ALL OUTPUTS

PART IV COMMON PROJECT ACTIVITES FOR ALL OUTPUTS

TABLE OF CONTENTS

Chapter 1 Joint Coordinating Committee

1.1 Joint coordinating committee (JCC)

JCC (Joint Coordinating Committee) is composed of government of Republic of Kenya and held almost every 6 months to report the project progress and adjust the schedule.

Arrangement of targets in the PDM (Project Design Matrix), approval of annual activity plan, progress review and evaluation, opinion exchange and so on, are the major tasks for JCC.

The JCC was held 6 times as shown in the following table.

Table 1.1-1 Holding of JCC

Names of meetings	Date
1st Joint Coordinating Committee meeting	18th , Aug., 2011
2nd Joint Coordinating Committee meeting	7th , Aug., 2012
3rd Joint Coordinating Committee meeting	13th , Feb., 2013
4st Joint Coordinating Committee meeting	8th , Oct., 2013
5st Joint Coordinating Committee meeting	20th , Mar., 2014
6st Joint Coordinating Committee meeting	31st , Jul., 2014

1.2 The First JCC (held on August 18, 2011)

Immediately after the commencement of the Project, the 1st JCC meeting was held on August 18, 2011, where the substance of the Project, issues to be solved and resolution methods, organization for implementation, etc. were presented. Through the discussions with WRMA (counterpart) and related organizations, those recognitions were shared, and understanding and cooperation were requested.

Detailed materials including minutes of meeting are shown in the Attached Document 7-1.

Table 1.2-1 The First JCC Agenda

PROGRAMME OF THE FIRST JOINT COORDINATING COMMITTEE OF THE PROJECT ON CAPACITY DEVELOPMENT FOR EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS

Venue: Kenya School of Monetary Studies

Date: 18th August, 2011

TIME	TOPIC	FACILITATOR
08.30 – 09.00	Registration	TM
09.00 – 09.20	Introduction and Welcome remarks	Technical Manager, WRMA
09.20 – 09.40	Official opening speech	PS, MWI
09.45 – 10.15	Speech by JICA chief representative	JICA Chief Representative
10.15 – 10.45	TEA BREAK	
10.45 – 11.30	Introduction of the project	CEO -WRMA
11.30 – 12.00	Presentation of the project	Project Chief Advisor
12.00 – 13.00	Plenary discussion	CEO -WRMA
13.00 – 14.00	LUNCH BREAK	
14.00 – 14.15	Signing of Minutes of Meeting and official launch	(PS, CEO, JICA and CA)
14.15 – 14.45	Speech by Representative, Embassy of Japan	Representative, Embassy of Japan
14.45 – 15.00	Closure of the meeting	Director of WR, MWI

1.3 The Second JCC (held on august 7, 2012)

The Project Team introduced implementation plan based on the survey carried out at the 2nd JCC Meeting on August 7, 2012. Implementation contents and schedule were approved by WRMA and related authorities with the following substantial themes.

Table 1.3-1 The Second JCC Agenda

2nd Joint Coordinating Committee Meeting
on
the Project of Capacity Development for Effective Flood Management
in
Flood Prone Areas (PCDEFM)

Agenda

Date: Tuesday 7 August 2012
Time: 14:00 – 16:30 (2 h 30 min)
Venue: KCB Leadership Centre- Karen

Objectives:
- To authorize PDM indicator within 5 months of the project commencement.
- To approve the annual work plan of the project
- To review and evaluate the general progress of the project
- To exchange opinions on issues regarding the project.
- To discuss any other issues pertinent to the smooth implementation of the Project

14:00-14:15	Registration (15 min)
14:15-14:20:	Opening Remarks from MWI (5 min)
14:20-14:25:	Opening Remarks from WRMA (5 min)
14:25-14:30	Opening Remarks from JICA (5 min)
14:30-15:00	Presentation of Progress Report from JICA Project Team (30 min)
15:00-15:45	Discussion (45 min)
15:45-16:00:	Break (15 min)
16:00- 16:30:	Wrap up and Closing Remarks (30 min)

(1) Building resilient communities against flood

Following matters were approved in order to strengthen the capacity of the community:

- Incorporate flood management into SCMP (Sub-Catchment Management Plan)
- Add the manual of WDC (WRUA Development Cycle) which can be a model for SCMP preparation to the flood management item

- Increase WRMA persons who have knowledge of civil engineering
- Promotion of systematic coordination with the stakeholders related to flooding

(2) Mitigation of Victims by Flooding

Provision of flood observation system, installation of simple early flood warning system and promotion of selection of water level observatory and observation, were agreed.

(3) System formation per basin units for preparation of flood management plan

(4) Systematic collaboration among the stakeholders for effective flood management

As for (3) and (4), it was agreed to share the flooding information, to collaborate among the relevant ministries and governmental organizations and WRMA to be the vanguard for flood management establishment.

Detailed materials including minutes of meeting are shown in the Attached Document 7-2.

1.4 The Third JCC (held on February 13, 2013)

Approval of evaluation results prepared by JICA Mid-term Evaluation Team, reporting of the project progress and discussion about the further plan were made at the 3rd Meeting on February 13, 2013.

The Project Team reported the current progress circumstances according to PDM (Project Design Matrix), which was approved by the attendants from Kenya side.

Table 1.4-1 The Third JCC Agenda

3rd Joint Coordinating Committee Meeting
on
the Project of Capacity Development for Effective Flood Management
in
Flood Prone Areas (PCDEFM)

Agenda

Date: Wednesday 13 February 2013
Time: 9:00 – 13:00 (TBC)
Venue: NHIF Auditorium, 2nd floor Wing B, NHIF Building, Nairobi

Objectives:
- To review and evaluate the general progress of the project
- To approve the annual work plan of the project
- To exchange opinions on issues regarding the project
- To discuss any other issues pertinent to the smooth implementation of the Project

8:30-9:00	Registration (30 min)
9:00 - 9:10:	Opening Remarks from MWI (10 min)
9:10 - 9:15:	Opening Remarks from WRMA (5 min)
9:15 - 9:20	Opening Remarks from JICA (5 min)
9:20 - 9:40	Progress Report from JICA Project Team (20 min)
9:40 - 10:10	Result of the Mid-Term Evaluation of the Project from JICA Study Team (30 min)
10:10 - 11:00	Discussion (50 min)
11:00 - 11:20	Tea Break (20 min)
11:20 - 11:40	Next Steps including Training Programme from Project Team (20 min)
11:40 – 12:00	Recommendations from JICA Study Team (20 min)
12:00- 12:50:	Wrap Up Discussion (50 min)
12:50- 13:00:	Closing Remarks from WRMA (10 min)

Output 1: Continuous promotion of incorporating the flood management items in such legal frameworks as CMS (Catchment Management Strategy), SCMP (Sub-Catchment Management Plan) and WDC (WRUA Development Cycle) manual in accordance with the concept of integrated basin flood management, was proposed.

Outline of future training including schedule and contents for strengthening the capacity of WRMA, was introduced and approved.

Output 2: It was explained that flood management plan were being prepared for Isiolo and Lumi basins and that integrated flood management committee was organized and held for both basins.

WRMA indicated urgent incorporation of the flood management plan into SCMP for the sub-basins under the Project concerning the community activities.

Detailed materials including minutes of meeting are shown in the Attached Document 7-3.

1.5 The Fourth JCC (held on October 8, 2013)

Project progress according to PDM was reported, necessity of revision of PDM and subsequent project proceeding and training plan were debated, and approved by the attendants from Kenya side.

Table 1.5-1 The Fourth JCC Agenda

4th Meeting of Joint Coordinating Committee (JCC)
on
the Project of Capacity Development for Effective Flood Management
in
Flood Prone Areas (PCDEFM)

Agenda

Date: Tuesday 8 October 2013
Time: 9:00 – 13:00
Venue: Utalii College, Nairobi

Moderator: Eng. Wilfred Matagaro. DTCM (Flood Management), WRMA

8:30- 9:00	Registration (30 min)	
9:00 - 9:05	Opening Remarks from MEWNR (5 min)	Mr. Nyaoro, Dir. Of Water Resouces. MEWNR
9:05 - 9:10	Opening Remarks from WRMA (5 min)	Eng. Olum, CEO. WRMA
9:10 - 9:15	Opening Remarks from JICA (5 min)	Mr. Eguchi, Chief Representative. JICA Kenya Office
9:15 - 9:55	Progress in Isiolo River Basin (Presentation: 30 min; discussion: 10min)	Mr. Kinyunju, MEN SRM, WRMA
9:55 - 10:35	Progress in Lumi River Basin (Presentation 30 min; discussion: 10 min)	Mr. Musau, NTL SRM. WRMA
10:35- 11:05	Progress in Gucha Migori River Basin (Presentation 20 min; discussion: 10min)	Mr. Maturwe, SSGM SRM, WRMA
11:05 – 11:20	Tea break (15 min)	
11:20 – 11:45	WRMA Flood Management Training Course in Kenya and in Japan (Presentation: 15 min; discussion: 10 min)	Eng. Kondo, JICA Project Team
11:45 – 12:00	Project Design Matrix and Work Plan (15 min)	Mr. Sawa. JICA Project Team
12:00 – 12:15	Non-structural measures in cooperation with KRCS in the target areas (15 min)	Kenya Red Cross Society
12:15 - 12:50	Wrap up Discussion (35 min)	
12:50 - 12:55	Closing Remarks from MEWNR (5 min)	Dir. Nyaoro. MEWNR
12:55 - 13:00	Closing Remarks from WRMA (5 min)	Eng. Olum. WRMA

Following are the substances of the meeting:

(1) Following two indications for PDM were approved.
-Ratio/number of trainees:
(1-4) More than 40 persons of WRMA staffs shall attend the training program throughout the Project duration.
-Participants of the Community Disaster Prevention Activity:
(2-3) More than 25 persons of WRMA staffs have experience in the community based flood management activities in the Project target areas.

(2) Subsequent proceeding substance on the Project (Plan of Operation) was approved.

(3) Current progress conditions of the 3 pilot projects were explained and approved.

(4) Plan of the training scheme was approved.

(5) The Governor for Taita Taveta County requested that such structural countermeasures as dike and drainage for flood control in Lumi river basin should be constructed in the manner of technical assistance as early as possible.

Detailed materials including minutes of meeting are shown in the Attached Document 7-4.

1.6 The Fifth JCC (held on March 20, 2014)

Appraisal results done by JICA's evaluation team for project completion were approved, project progress status was reported and subsequent proceeding substance on the project was discussed among the attendants.

The Project Team reported the project progress done so far in accordance with PDM (Project Design Matrix), which was confirmed and approved by the Kenya side.

Detailed materials including minutes of meeting are shown in the Attached Document 7-5.

Table 1.6-1 The Fifth JCC Agenda

Workshop and 5th Joint Coordinating Committee (JCC) Meeting Agenda		
Date: 20th March 2014 Thursday Venue:Utalii College, Nairobi (MC: Mr. Alexander Nzyuko, DTCM, WRMA)		
8:00- 8:30	30min	Registration
8:30- 8:35	5min	Opening Remarks from MEWNR (Dir. Nyaoro)
8:35- 8:40	5min	Opening Remarks from WRMA (Eng. Olum, CEO)
8:40- 8:45	5min	Opening Remarks from JICA Kenya Office (Mr. Eguchi, Chief Representative)
8:45- 9:00	15min	Opening Remarks from JICA Project Team (Eng. Kondo, Chief Advisor)
9:00- 9:20	20min	Report on activities on Output 1 including Training in Kenya and Japan, Revision of WDC Manual, Establishment of FMD, Revision of NWRMS and CMSs (Eng. Kimanga, WRMA-FMU)
9:20- 9:50	30min	Report on activities on Output 2 from Isiolo Sub Catchment (WRMA-SRM&WRUA&KRCS)
9:50- 10:20	30min	Report on activities on Output 2 from Lower Lumi Sub Catchment (WRMA-SRM&WRUA&KRCS)
10:20- 10:50	30min	Report on activities on Output 2 from Lower Gucha Migori Sub Catchment (WRMA-SRM&WRUA&KRCS)
10:50- 11:05	15min	Tea Break
11:10- 11:40	30min	Discussion on the reports (Facilitator: Eng. Wanyoni, WRMA-DTCM)
11:40- 12:00	20min	Disaster Management Policy, Post-Hyogo Framework for Action (HFA) and World Conference on Disaster Risk Reduction (WCDRR) (Mr. Gordon Otieno Muga, Ministry of Interior and Coordination of National Government)
12:00- 13:00	60min	Discussion on "Devolution and Flood Management" (Facilitator: Eng. Wanyoni)
13:00- 13:50	50min	Lunch Break
14:00- 14:30	30min	Result of the Terminal Evaluation of the Project (JICA Terminal Evaluation Study Team)
14:30- 15:00	30min	Discussion on the result of the Terminal Evaluation (Facilitator: Eng. Wanyoni)
15:00- 15:15	15min	Tea Break
15:15- 15:35	20min	Future development of flood management after the Project (Eng. Kimanga)
15:35- 15:55	20min	Discussion on the Future development of flood management after the Project (Facilitator: Eng. Wanyoni)
15:55- 16:00	5min	Closing Remarks from JICA Terminal Evaluation Study Team (Mr. Miyata, Director of Disaster Management Division 1, Global Environment Department, JICA)

1.7 The Sixth JCC (held on July 31, 2014)

The sixth JCC meeting was held on 31st July 2014 at Utalii College in Nairobi.

Table 1.7-1 The Sixth JCC Agenda

8:30- 9:00	30 min	Registration
9:00- 9:05	5 min	Opening Remarks from MEWNR (Dir. Nyaoro, MEWNR)
9:05- 9:10	5 min	Opening Remarks from WRMA (Eng. Olum, CEO, WRMA)
9:10- 9:15	5 min	Opening Remarks from JICA (Mr. Hanai, Senior Representative, JICA Kenya Office)
9:15- 9:25	10 min	Background and Outline of the Project (Mr. Sawa, JICA Project Team)
9:25- 9:55	30 min	Report on Output 1 (Mr. Simon Mwangi, WRMA-FMU)
9:55- 10:15	20 min	Discussion
10:15- 10:45	30min	Report on Output 2 (Ms. Elizabeth Diego, WRMA FMU)
10:45- 11:05	20 min	Discussion
11:05- 11:20	15 min	Tea Break
11:20- 11:50	30 min	Report of capacity development on flood management in WRMA (Mr. Alexander Nzyuko, WRMA-FMU)
11:50- 12:10	20 min	Discussion
12:10- 12:30	20 min	Presentation on the Next step on flood management in WRMA (Eng. Kinyua, TCM)
12:30- 12:55	25 min	Wrap-up discussion/Handing Over of Instruction manuals
12:55- 13:00	5 min	Closing Remarks (Dir. Nyaoro, MEWNR)
13:00- 13:10	5 min	Vote of thanks (Mr. James Ambuso, FAM)

Detailed materials including minutes of meeting are shown in the Attached Document 7-6.

Chapter 2 Working Group

Working Group (WG) is defined as members to be a counter part of the project team consisted from long term expert, short term expert and consultants.

Technical Coordination Manager belongs to WRMA Head Quarter is a head of WG, and Flood Management Unit Head Quarter is also a member of WG. In addition, from WRMA Regional office and Sub-regional office, regional manager, sub-regional manager, catchment management officer, surface water officer, community development officer and newly established flood management officer were assigned to WG.

In this project, there are three river basins set as pilots in rural areas, and each river basin is controlled by WRMA Regional Office (RO) and Sub-regional Office (SRO) belonging to RO.

In order to promote the activities in the pilot basins, the cooperation with local community is essential. Therefore FMU and the project team held working group meeting so that enhances the coordination with local community, share and percolate the knowledge or lessons learnt from the activities by gathering and meeting of members such as FMU, RO, SRO and the project team. Details of working group meetings are shown below.

Table 2.1.-1 Working Group meetings and date

Name of meeting	Date
The 1st Working group meeting	February 21, 2012
The 2nd Working group meeting	July 26, 2012
The 3rd Working group meeting	August 2, 2012
The 4th Working group meeting	November 29-30, 2012
The 5th Working group meeting	June 4-5, 2014

2.1 The 1st working group meeting (February 21st, 2012)

Main discussion points on the 1st working group meeting are shown below, and the minutes of meeting etc. are shown in appendix 4-1.

(1) A report of baseline survey results

A report, question and answer of baseline survey that was conducted by the local consultant -Environ Check Ltd., - as a contractor was done. The survey results implemented for 720 targets or GIS data made in the course of survey were provided by local consultant. And then, the information that have some points to be confirmed will be modified according to the comments from the group member afterward.

(2) A report of project target areas for the purpose of establishing the "Flood Management Forum"

A report of status for forum member selection from 3 Sub-catchment and candidates information, and then the proposal will be sent to WRMA Head Quarter by 24th Feb., 2014.

(3) Integrated Flood Management Plan should be included into SCMP

It decided that the thought of Integrated Flood Management will be included to SCMP, and

WRMA Head Quarter, RO and SRO decided to provide the necessary information for this matter to WRUA. FMU will make arrangement with WSTF about the matter that the flood management will be included in SCMP.

(4) A progress report from the project team

The project team reports the current situation of activities along the "PDM".

(5) A proposal for establishment of the flood management framework in Kenya

An explanation of the flood management framework was done by the project team, and the relevant documents would be provided to working group members after laminating.

(6) Work plan of JICA chief advisor

The work plan of JICA chief advisor was explained by Mr. Kobayashi. A member requested the moving up of the training plan.

(7) Work plan of the project team

The work plan of the project team was explained by the member of the project team. Question and answer about the nearest JCC were done.

2.3 The 2nd working group meeting (July 26th, 2012)

The discussion points in the 2nd Working group meeting is shown below. And the minutes of meeting etc. are shown in appendix4-2.

(1) A report of the information collection situation

The information collection situation was explained in each 3 project site by each Sub Regional Manager and Flood Management Activity Supervisor. The members confirmed that part of un-obtained data will be provided from the members shown below.

- Topographic map Mr. Mwakamba (Ath Regional Manager)
- DH files Mr. Nzyuko (WRMA FMU)
- Flood damages Each Sub Regional Manager

(2) Preparation for holding "Effective Flood Management Workshop"

The concept note was explained by Mr. Kinyua as Technical Coordination Manager of WRMA, the holding of Effective Flood Management Workshop in Nairobi was announced. The arrangement for presentation contents and speakers that will be presented was done, and it was agreed that each Sub Regional Manager will make presentations. In addition, it was agreed that KRCS and Ministry of Special Program will make the presentations.

2.4 The 3rd Working group meeting (August 2nd, 2012)

The discussion points in 3rd Working group meeting is shown below. And the minutes of meeting etc. are shown in appendix4-3.

(1) A report of the information collection situation

The information collection situation was explained in each 3 project site by each Sub Regional Manager and Flood Management Activity Supervisor. The members confirmed the part of un-obtained data, personnel in change of collection and collecting dead line as followings.

- Population fluctuation in Isiolo area
- Statistic information in Agriculture, Manufacturing and Commercial
- High Discharge Equation for Gauche Maori area
- Past flood records in Isiolo

(2) Preparation for holding "Effective Flood Management Workshop"

Time schedule, personnel in charge, their roles and allocation were explained. It agreed that chairperson in the workshop will be performed by person from MWI, ceremony master will be performed by Mr. Kinyua as WRMA Technical Manager and facilitator will be performed by Professor Khroda belongs to Nairobi University. It agreed that the presentations are presented by Nyatike District Commissioner and Sub Regional Managers from each project area.

(3) Joint Coordinating Committee Meeting

It agreed that the chairperson of the meeting will be performed by Permanent Secretary or Mr. Nyaoro as the water resource director of MWI

2.5 The 4th Working group meeting (November 29&30th, 2012)

The discussion points in 4th Working group meeting is shown below. And the minutes of meeting etc. are shown in appendix4-4.

(1) Capacity assessment of WRMA staff

The outline of capacity assessment of WRMA staff was explained by the project team, and capacity development that will be carried out through the project and the plan were also explained.

(2) Capacity assessment of WRUA member and community

The outline of capacity assessment of WRUA members and community was explained by the project team, and capacity development that will be carried out for WRUA by WRMA staff through the project and the plan were also explained.

(3) Flood risk reduction activity done by KRCS

The examples of activity done by KRCS for flood risk reduction in Nyando and other area were explained by KRCS member. WRMA and KRCS discussed about the advantage of cooperation against the problem of floods.

(4) Integrated Flood Management Committee

The concept note of Integrated Flood Management Committee and establishment plan of committee meeting were explained by the project team.

(5) Community based flood management module to be included in SCMP and WDC module

The project member explained the characteristics and phenomenon in the pilot river basin, by using the cause analysis and inundation maps. Damages & influences were explained based on the ratings of damage severances. And the flood measures were proposed.

2.6 The 5th Working group meeting (June 4&5th, 2014)

The discussion points in 5th Working group meeting is shown below. And the minutes of

meeting etc. are shown in appendix4-5.

(1) Capacity assessment of WRMA staff (After the trainings)

The outline of capacity assessment was explained by the project team, and then tried to evaluate the before and after of the improvements after the training. In the process of evaluation, the members discussed the reason of evaluation results, and then talked about the remaining problems and measures.

(2) Explanation of "Knowledge Management" and discussion

The project team proposed the introduction of operation model that includes the systematic management of documents and routine work of flood survey, and the members discussed about the actual implementation. Finalization of "Knowledge Management" was to be discussed between Mr. Simon and the project team and the implementation of "Knowledge Management" introduction was agreed.

(3) Nationwide expansion of IFMP

The project team explained the time frame of nationwide expansion and budget allocation. After the explanation, the members agreed that the implementation activities will be done against 6 river basin within 1 year and half, and after the completion, the activities will be done against other remaining 6 river basin. That is to say, the agreement of nationwide expansion will be completed within 3 years was done.

(4) The arrangement for the implementation of flood forum

Rearrangement to change the date from 18 & 19th, June to 24 &25th, 2014 was done, because the former date of hold will be duplicated the date of national president's visiting. The project team explained about the attending members and discussion points, and then the members agreed with the holding the forum.

Chapter 3 Workshop

3.1 Workshop

The following workshops were held corresponding to the JCC Meeting as above-mentioned for the purpose of sharing the information on flood management among the authorities and governmental organizations concerned to establish the network system.

Table 3.1-1 Workshop Held

Workshop	Date Held
The 1st Workshop	August 7, 2012
The 2nd Workshop	February 12, 2013
The 3rd Workshop	March 20, 2014

Main attendants to the workshops were members of WRMA (Water Resources Management Authority), staffs of MEWNR (Ministry of Environment, Water and Natural Resources), members of WRUA (Water Resources User Association) as well as district commissioner of the 3 pilot project areas, KMD (Kenya Meteorological Department), KeNHA (Kenya Highway Authority), KURA (Kenya Urban Road Authority), NEMA (National Environmental Management Authority), Ministry of Land and Kenya Red Cross Society.

In addition to the reporting of the project progress status, information sharing was achieved between WRMA and the attendants through the presentation of the flood management circumstances from the viewpoints of the authorities concerned.

A professor of Nairobi University who is ex-administrative vice-minister for Ministry of Water and Irrigation (MWI) functioned as the facilitator and positive discussions were done among all the attendants including activity reporting and current work reporting of WRUA at respective pilot project sites, by which information sharing was achieved among WRUAs.

3.2 The first workshop (held on August 7, 2012)

Attendants were the director for MWI, technical manager for WRMA head office, members from FMU (Flood Management Unit of WRMA), regional offices, sub-regional offices, staff of JICA Kenya office and the Project Team members.

Table 3.2-1 The first workshop agenda

7th August, 2012

Workshop
on
Effective Flood Management

Agenda

Date: Tuesday 7 August 2012
Time: 8:30 – 13:30
Venue: KCB Leadership Centre- Karen

Objectives:
- To share the current information related to flood management in various actors
- To exchange opinions for better flood management
- To establish a network for flood related information gathering and sharing
- To share the current situation of community and see the future possibilities of community based flood management activities.

The result of project activities in the last 1 year
- From the analysis by the project, the importance of the integration of information related to floods and the implementation of community based activities is declared. Therefore, those 2 matters will be emphasized in this workshop. In theme 2, the project will focus in 3 pilot areas to develop the matter in the future project activities.

8:30-9:00 **Registration** (30 min)

9:00-9:05: **Opening Remarks from MWI** (5 min)

9:05-11:00 **Presentation and discussion on theme 1** (115 min)
Theme 1: Information sharing and integration on flood cause and effect
- Flood damage cost collected by the Cabinet (OPM, Crisis Response Centre) (15 min)
- Meteorological data and early warning on floods (MEMR, Kenya Meteorological Department) (15 min)
- Hydrological data (WRMA Sub Regional Manager) (15 min)
- Flood situation of last rainy season in project area (Nyatike District Commissioner) (15 min)
- Group Discussion (20 min)
- Plenary Discussion and Presentation from Groups (5 min x 5 groups +10 min = 35 min)

11:00-11:20: **Break**

11:20-12:50: **Presentation and discussion on theme 2** (90 min)
Theme 2: Community Based Flood Management Activities
- CBDM approaches in Kenya (Ministry of State for Special Programmes) (15 min)
- Current Sub Catchment Management Plan (SCMP) (Chairman WRUAs) (15 min)
- Group Discussion (10 min)
- Plenary Discussion and Presentation from Groups (5 min x 5 groups +20 min = 50 min)

12:50- 13:40: **Wrap up and Closing Remarks** (40 min)

1

Discussions were made on the Theme-1 (Information Sharing and Integration on Flood Causes and Effects) and Theme-2 (Community-Based Flood Management Activities) separately.

As to Theme-1, discussion was focused on 3 items, i.e. amount of damage by flood to be assessed by CRC (Crisis Response Centre), meteorological data and flood early warning to be collected and processed by KMD (Kenya Meteorological Department) and hydrological data to be collected and processed by WRMA's regional offices.

Following shows part of the presentation:

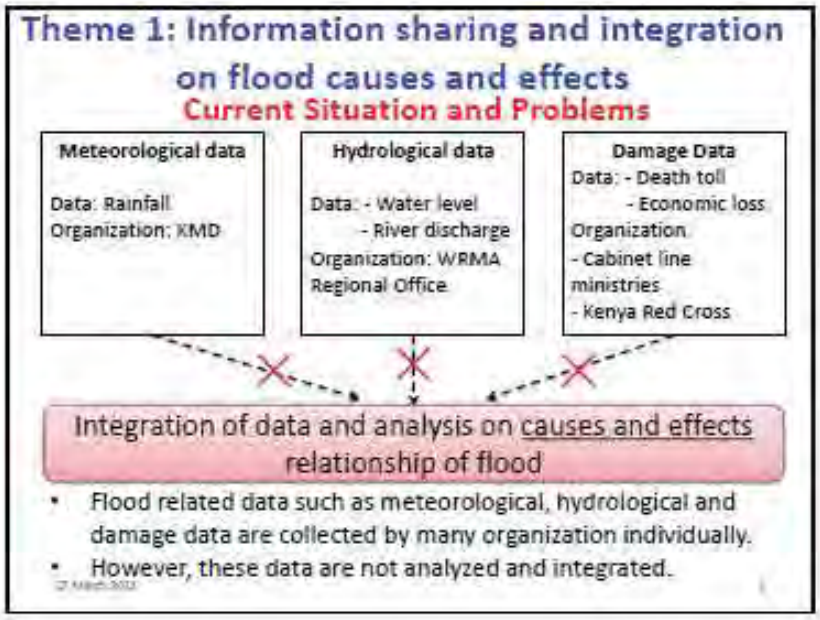


Fig. 3.2-1 Theme-1 (Information Sharing and Integration on Flood Causes and Effects)

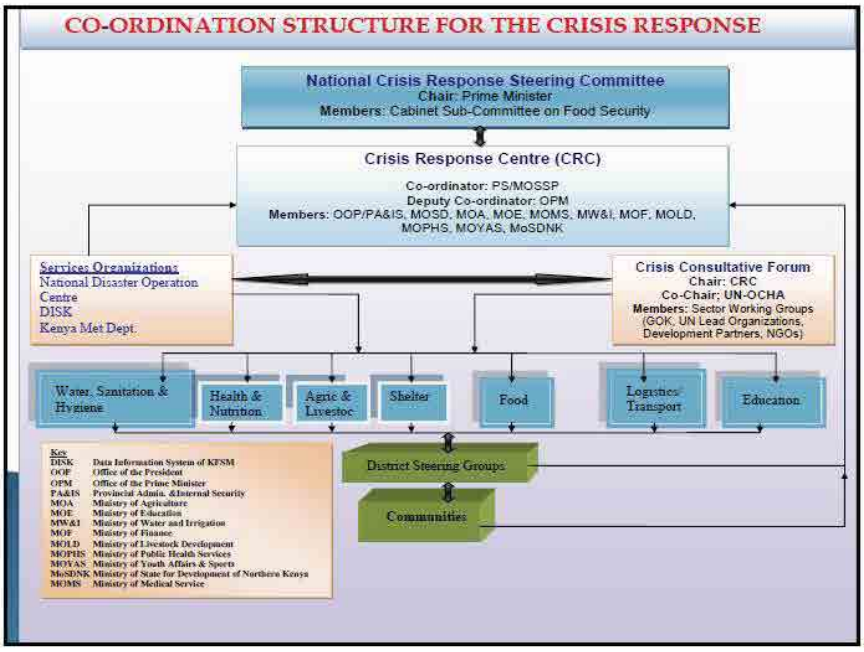


Fig. 3.2-2 Amount of Damage by Flood to Be Assessed by CRC

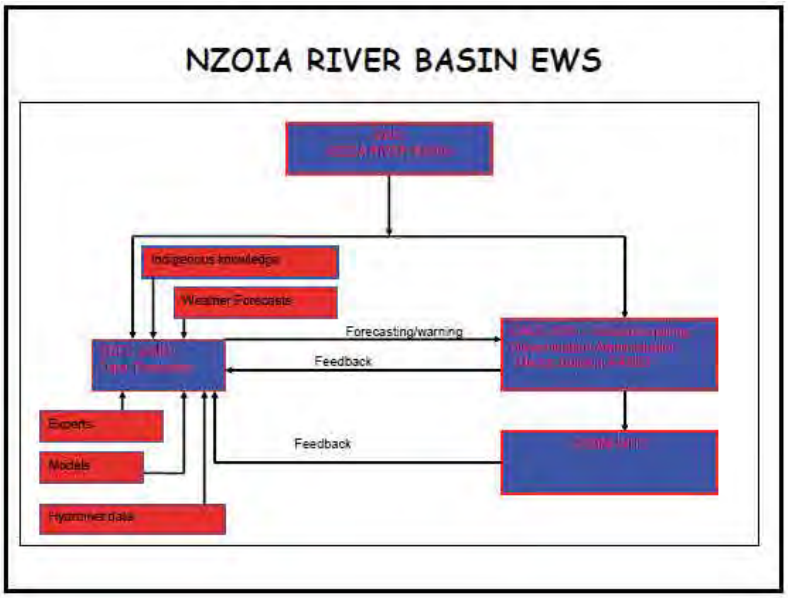


Fig. 3.2-3 Meteorological Data and Flood Early Warning to Be Collected and Processed by KMD

Data Collection methods

i) Use of honoraria gauge readers
ii) By WRMA staff during monthly monitoring.
iii) Collaboration with other stakeholders e.g KMD, Agriculture

Challenges in data collection:

i) Inconsistencies in reading i.e. unreliable observers.
ii) Manual reading may not be possible during flood season.
iii) Vandalism of the hydrological stations by floods and scrap metal dealers.
iv) Low wage payment of observers i.e. Kshs. 1000/- per month.
v) Inadequate hydrological network.
vi) Inadequate or lack of field equipments
vii) Inadequate transport.

Gucha-Migori at WAthongeri

Fig. 3.2-4 Hydrological Data to Be Collected and Processed by WRMA Regional Offices

As to Theme-2, robust / resilient substance against the flood required for the community in terms of strengthening flood management in the course of disaster occurrence.

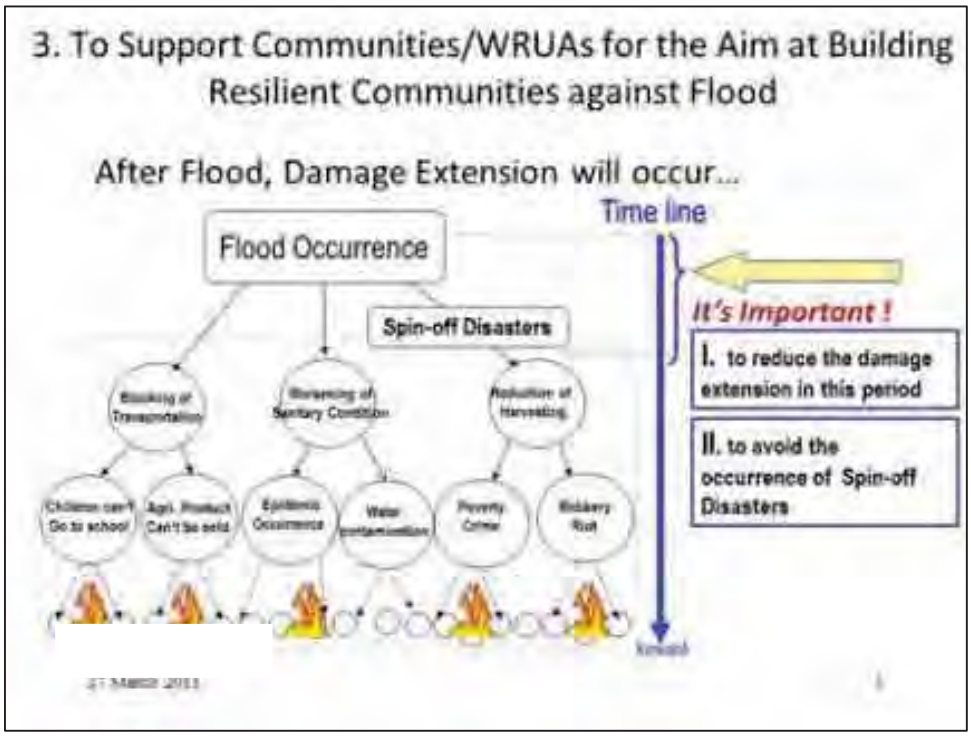


Fig. 3.2-5 Theme-1 (Information Sharing and Integration on Flood Causes and Effects)

The Project Team proposed that the flood management should be incorporated into the existing SCMP (Sub-Catchment Management Plan), for which the flood management requirements should be incorporated into the WDC (WRUA Development Cycle) manual.

Following shows a part of the Project Team's presentation:

Fig. 3.2-6 (Amount of Damage by Flood to Be Assessed by CRC)

3.3 The second workshop (held on February 12, 2013)

The participants were the director for MWI, technical manager for WRMA head office, members of FMU, regional offices, sub-regional offices, personnel of the authorities concerned, staffs of JICA Kenya office and the Project Team.

Table 3.3-1 The second workshop agenda

Workshop on Effective Flood Management

Agenda

1. Opening Remarks from Ministry of Water and Irrigation

2. Presentation and discussion on theme 1
   Flood Hazard mapping

3. Presentation and discussion on theme 2
   Roads and Flood, NEMA EIA and floods in Kenya context, IFMC in Isiolo, Flood early warning in Isiolo

4. Presentation and discussion on theme 3
   Community flood hazard maps, Community based flood early warning in Lower Gucha Migori, Community based flood management activities

5. Wrap and closing remarks

Presentation and discussion were made for the 3 Themes respectively.

Discussion about the necessary information and important data for preparation of the hazardous map was made as to Theme-1.

Discussion about effects of flooding to the road sector and environment sector, integrated basin flood management and early warning system of flood, was made as to Theme-2.

Community-based flood management being implemented in Lower Gucha Migori WRMA was reported and discussed as to Theme-3.

Following shows a part of presentation:

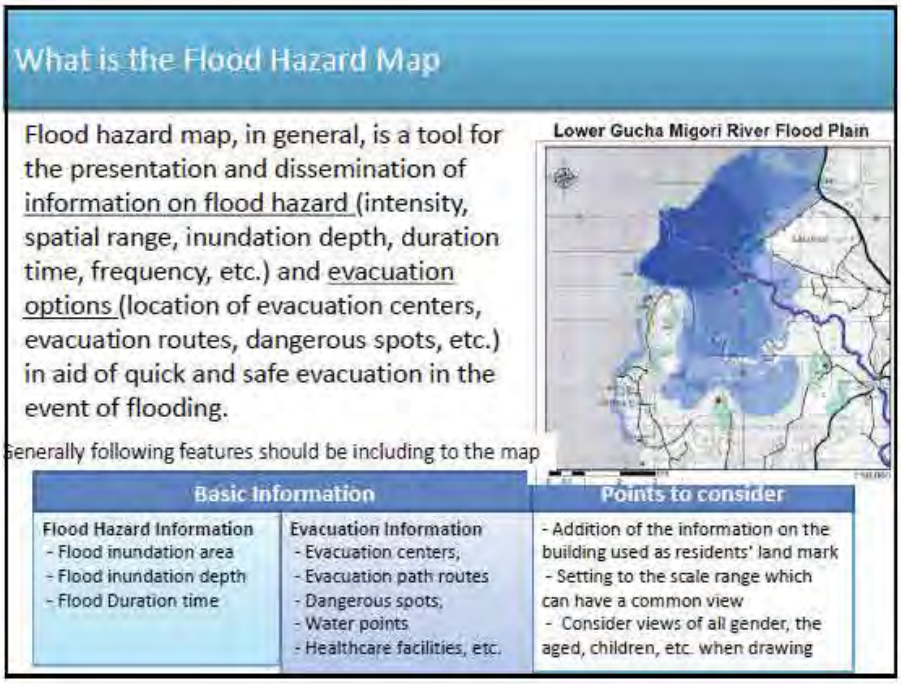


Fig. 3.3-1 Preparation of Hazardous Map in the Community Presented by the Project Team on Theme-1

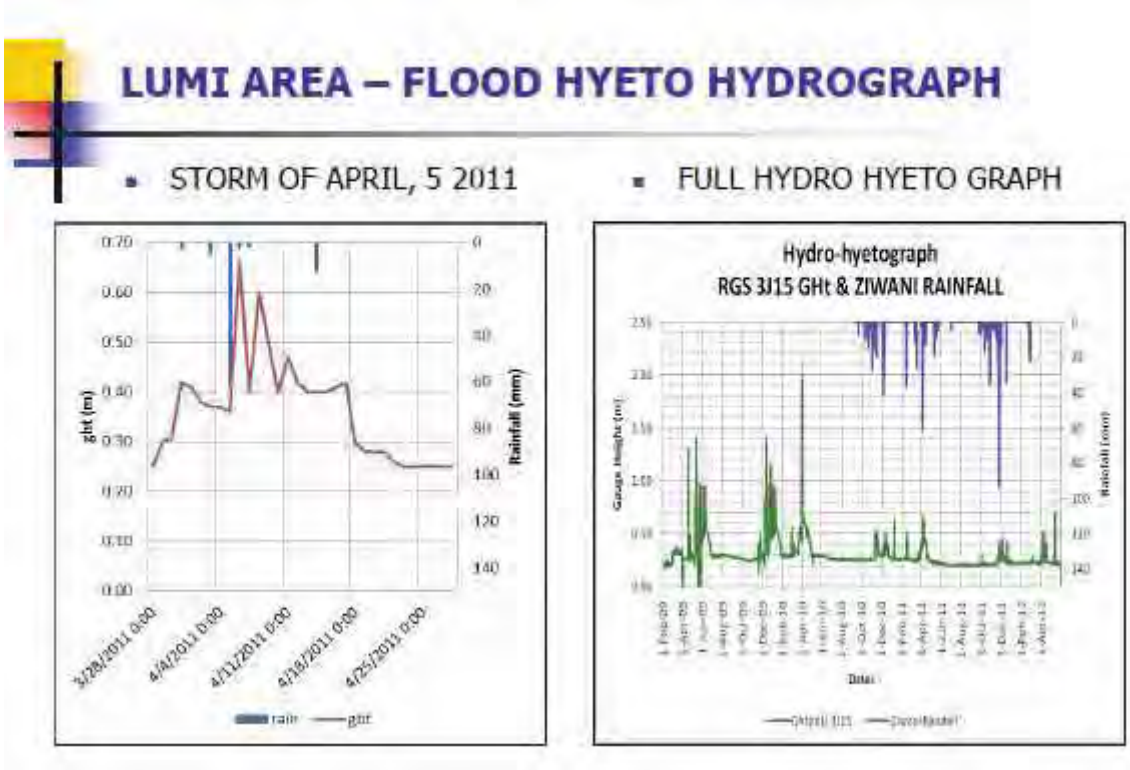


Fig. 3.3-2 IFAS (Integrated Flood Analysis System) Presented by FMU (Flood Management Unit of WRMA) on Theme-1

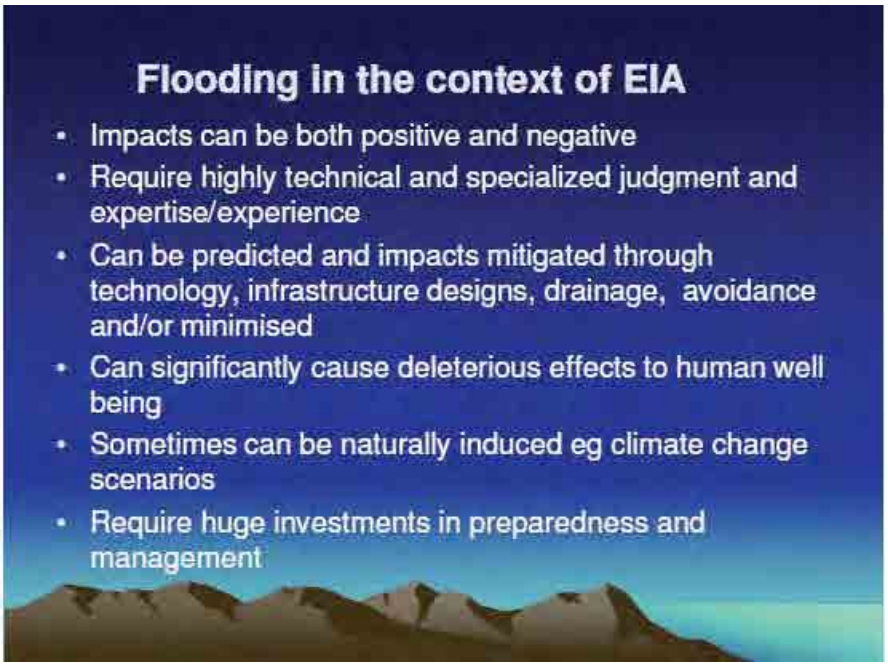


Fig. 3.3-3 EIA (Environmental Impact Assessment) Presented by NEMA (National Environmental Management Authority) on Theme-2

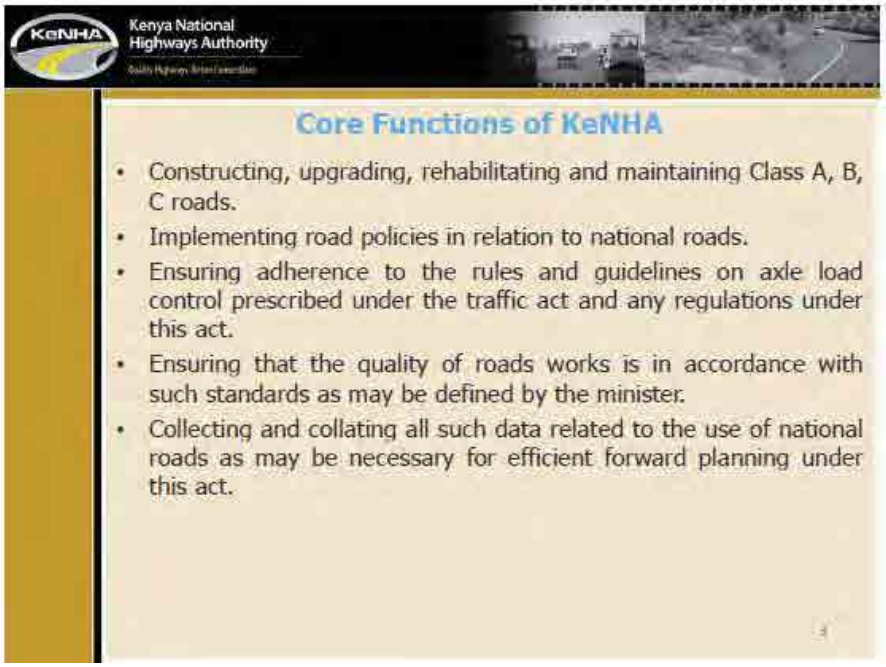


Fig. 3.3-4 Measures against Flood Damage Presented by KeHNA (Kenya Highway Authority on Theme-2

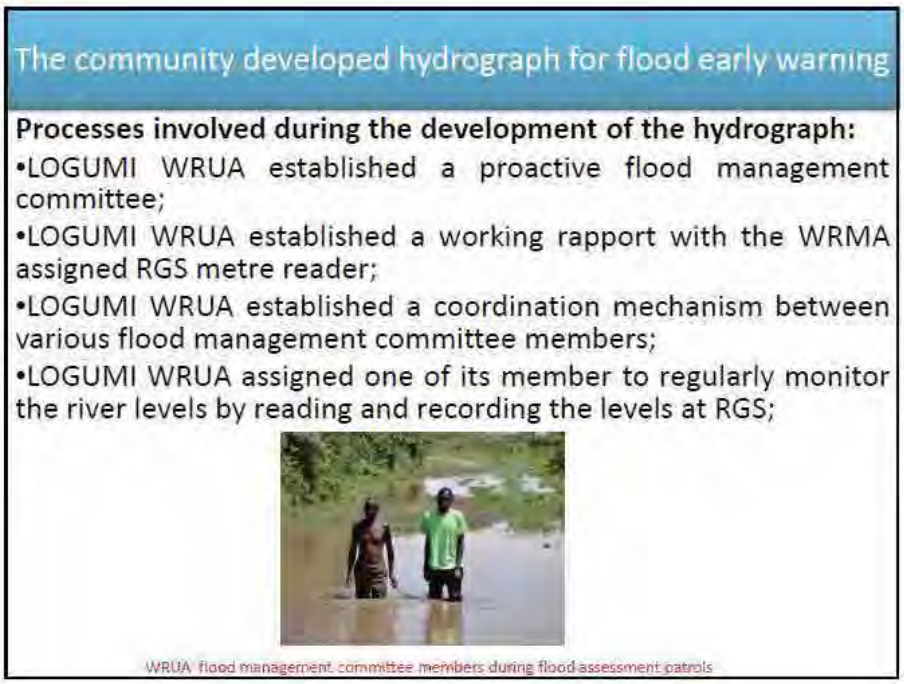


Fig. 3.3-5 Flood Management Taken by LOGUMI WRUA on Theme-3

3.4 The third workshop (held on March 20, 2014)

This workshop was held in the course of the 4th JCC Meeting, i.e. workshop in the morning and JCC meeting in the afternoon. Participants and agenda were the same as those for the morning session of the 4th JCC meeting.

Chapter 4 Weekly Meeting

4.1 Weekly Meeting

The members of FMU belong to WRMA Head Quarter held weekly meeting almost every weeks. There is a background of holding weekly meeting. FMU members had many journeys on business, and it was necessary that WRMA FMU and the project team should assure the chance to discuss each other because it was difficult to meet.

Although the contents of the meetings were various, mostly the discussion was done based on the structure shown below, by discussing about the proposal from the project team. In addition, the action items should be done with cooperation and personnel in charge were clearly determined, and then the members reported and confirmed the progress and outcomes every time.

Table 4.1-1 Structure of discussion in weekly meeting (Example)

Structure of discussion		
No.	Discussion point	Contents
1.	Review of previous meeting	Confirmation of the decision or action item determined in previous meeting
2.	Topics	Discussion on the activity reports or various information such as revised legal acts etc. and coping policy. The number of topics will be set on a case by case.
3.	Topics	
4.	Topics	
5.	Progress report and confirmation of Action Item	The members report the progress of action items or obtained outcomes through the activities, and define new items for the next step.
6.	A.O.B (Any Other Business)	Discussing on any other business if it is necessary.

(N.B.) The number of item and contents will be different in each meeting

Within 3years and half, totally, 116 times meetings were held from the first meeting on 1st November, 2011 to the last meeting on 3rd June, 2014.

Chapter 5 Coordination with Long and Short Term Experts

Experts for long term assignment and short term assignment were dispatched, with whom the Project Team executed the activities.

5.1 Long term expert

2 experts were assigned as chief advisor for flood management administration as follows.

Mr. Hajime Kobayashi: July 2011 to December 2012

Mr. Katsuro Kondo : November 2012 to June 2014

Their duty roles were policy advisory service for WRMA CEO and suggestion on the policy and operation of WRMA head office in charge of implementation of flood management.

As the Project Team is composed of the consultant and long-term-assigned experts, following shows specific duties of the latter.

- Suggestion on the future flood management plan to be prepared by WRMA
- Suggestion on Catchment Management Strategy to be prepared by WRMA
- Suggestion on the inclusion of the flood management in NWRMA (National Water Resource Management Strategy) to be proposed by WRMA
- Suggestion on establishing the training system for the personnel of WRMA and related Authorities
- Suggestion on the institution of knowledge-management cultivated by WRMA regional offices and sub-regional offices for implementation of WRMA head office
- Suggestion on the system of organization, personnel, budget and fund-acquisition for activities to be firmly established by WRMA

5.2 Short term expert

5.2.1 Short term expert (Mr. Toshio Okazumi)

Mr. Toshio Okazumi

(1)Purpose

To discuss about the following matters in order to enhance the project activities:

1) Concept of sustainable flood management in Kenya
2) Roles of WRMA in charge of project implementation
3) Identification of WRMA's current ability as to flood management
4) WRMA's ability required for achieving its roles
5) Study on sustainable development of the flood management by WDC in terms of legal system, organization and budget basis

(2)Time Assigned

Period assigned: May 27, 2012 to June 2, 2012

Table 5.2-1 Field Activities Extended by Mr. T. Okazumi

Day	Time	Meeting parsonnel		Otganization
27	12:00	Prof. Japheth O. Onyando	Technical Advisor	GIZ
	Accomodation	Silver Springs Hotel		
28	9:00	John P. Olum	Chief Executive Officer	WRMA
	10:30	Alexandar M. Nzyuko	Deputy Technical Coordinating Manager	FMU, WRMA
	14:00	Patrick Nduati Mwangi	Senior Water and Sanitation Specialist	World Bank
	15:30	Mr. J. Hanai, Ms.M. Fukai	Senior Representative, Staff	JICAOffice
	Accomodation	Silver Springs Hotel		
29	9:00	Jaco Mebius	First Secretary/Senior Policy Advisor Water and Sanitation	Embassy of the Kingdom of the Netherlands
	11:00	Eng. Patrick L. Ombogo	Director Water Sector Reform Secretariat	MWI
	16:30	Eng. Joseph M. Kinyua	Technical Manager	WRMA
	17:10	Ms.R. Nakajima	WRMA JOCV for WRUAs' activities	JOCV
	Accomodation	Silver Springs Hotel		
30	9:00	Eng. W.O. Onchoke	Deputy Director of Irrigation, Drainage and Water Storage	MWI
	11:00	Elijah Omusina Bukachi, others	Assistant Director	KMD
	14:30	Col Nathan M. Kigotho	Director	National Disaster Operation Centre, Office of the president
	16:00	Mr. T. Okamura	Deputy General Manager, Water&Energy Dept.	Nippon Koei
	Accomodation	Silver Springs Hotel		
31	9:30	Jacqueline K. Musyoki Maria Notley, Ann Nabangala Obae	Chief Executive Officer, Technical Advisor, Programme Officer, Environement	WSTF
	10:45	Mr. J. Hanai, Ms.M. Fukai	Senior Representative, Staff	JICA Office
	14:05	John P. Olum	Chief Executive Officer	WRMA
	15:00	John Rao Nyaoro	Director of Water Resources	MWI
	PM	Kitangera	Field Survey	
	Accomodation	Kibo Slopes Cottages Limited		Loitokitok
1		Loitokitok, Taveta, Lake Jipe	Field Survey	
	Accomodation	Silver Springs Hotel		
2	22:45	AF 8003	Departure to France	

Source : Toshio Okazumi, Report of operation advisory for PCDEFM, 4th Jun. 2012

(3)Outline of Activities

Mr. T. Okazumi extended his activities as to recognition of WRMA's data possession, information collection of pre-caution and warning for evacuation and reformation status of the water sector policy in Kenya, and their analysis.

Following shows examination results of respective activities.

1) Examination of WRMA's Data Collection, Thorough Check thereof

KMD is in charge of collection and control of meteorological and precipitation data and WRMA is in charge of the same for water level data and flow data.

Out of about WRMA's 500 observatories for water level, 200 observatories are directly controlled by WRMA and the remainder is entrusted to observation personnel for measurement at 1,000 Kenya Shillings per month.

Water level is measured basically twice a day, not by time-based measurement, thus, it cannot be used for flooding forecast of the rivers having slope.

It is unknown how precisely WRMA has checked the data.

Data measured by observatory persons are likely to be unusable.

WRMA will provide about 15 automated observatories in the future, and Water Data Book will be prepared by the end of 2012.

2) Current Condition of Pre-Caution / Warning Information for Evacuation

Weather forecast is available on the basis of day, next 3 days, next 1 week, next 1 month and season, of which source is satellite and meteorological observation.

Kenya has no meteorological radar but only estimate indication.

Precipitation is not forecasted by quantitative measurement.

Flood forecast is not in service, of which reason can be judged by the frequency of water level observation currently done twice a day.

Meteorological information is dispatched to the regional areas where broadcasting from radio station is diffused, provided those areas are limited.

Disaster prevention information is spread, in addition to KMD's, from Office of the President via provincial and district authorities. Respective Governors are responsible for evacuation notice, however in case of large damage, the President is to judge the necessity of inhabitants evacuation through the District Commissioner and Governor.

Automated observatory, as well as dike and dam, is installed at Nzoia River only by the assistance of World Bank, and Flood Management Committee is in charge of flood precaution and warning. Flood Management Committee was established by the Office of President and Ministry of State for Special Program in association with WRMA and KMD.

Precaution and warning system exists at Ewaso Nyiro in the project assisted by the Red Cross Society, which functions as transmitting system of informal inhabitants' information on flooding in the community area. This functional system is rather effective than nothing in case the flooding lasts longer.

3) Reformation of Water Sector Policy

Reformation of water sector policy in Kenya is in progress, and scheduled to be approved in September 2012 and executed after the President election in February 2013.

Some foreign donors are doubtful about its execution because of political disorder occurred at the time of the President election in the past.

Whereas, since the reformation is derived from transition of the Constitution it is envisaged that no objection to it will be raised. On the other hand, WRMA has no anxiety about the fragility of Flood Management indicated by the Project Team on the standpoint that national policy will be strategically improved even though the new President be elected.

Although the management will be transferred to the authorities in the basin concerned under the reformation, it will be controlled by the personnel of WRMA Regional Office; therefore, there will be no substantial alteration even under the reformation.

WRMA-CEO expressed that the Congress determined WRMA Regional Office would continuously be in charge even in the Basin Level against some anxious opinions about the alteration of the Bill and resultant random Autonomous Board.

Person in charge of water supply and hygiene of World Bank welcomes this reformation as it is requisite. Ex-chairman for donor council in water sector expresses similar welcome basically.

5.2.2 Short term expert (Prof. Kenichi Tsukahara)

(1)Purpose

He was responsible for identifying flood occurrence substances as the fundamental basis for Flood Management, for instructing relevant approach and method required for recognizing flood causes and damages judged from flood occurrence substances and for instructing study on the future measures to be taken in the Project.

(2)Time Assigned

Period assigned: August 12, 2012 to August 17, 2012

Table 5.2-2 Field Activities Extended by Prof. K. Tsukahara

Date	Action item		Remarks
	Before noon	After noon	
12th, Aug. 2012, Sunday		14:45 Arriving at Nairobi Int'l Airport 18:00 Meeting -Arrengement for action plan-	
13th, Aug. 2012, Monday	8:30or 9:00 Courtecy Call to MWI 10:00-13:00 Attending to WRMA weekly meeting with Technical Coordination Manager and FMU member	14:00-15:30 Attend the lecture entitled as "Generating, Usage and Application Expansion of Topographic maps by using images from ALOS" presented by Expert Mr. Takahashi from JAXA 15:45 Courtecy Call to Chief representative of JICA Kenyan Office	-MWI -Director Nyaoro- -WRMA -CEO Olum was abcent-
14th,Aug., 2012, Tuesday	- Discussion on updating of the Action Plan	- Discussion on the implementation plan of WS	
15th,Aug., 2012, Tuesday	Site survey at rural area –Taveta-		
16th,Aug., 2012, Tuesday			
17th,Aug., 2012, Tuesday	-Summery of surveillance -Reporting to JICA Kenyan Office	16:40 Departure from Nairobi Int'l Airport	

(3)Outline of Activities

He directed WRMA to utilize materials of flooding such as map and hydrological data and to manage the flood control, as recognized by his site survey of the basin areas, by identifying current operation of the flood management and damages.

1) Meeting with Mr. Nyaoro (Director General for MWI)

He explained how to utilize hydrological references and disaster-damage references showing map of area damaged by heavy rain with hydrological data of Japan.

The Director General recognized those references were usable for improving flood countermeasure and noted their importance to explain to the public.

2) Site Survey at Lumi River Basin

Mr. Maina, chief technical person of WRMA sub-regional office, accompanied him to survey Lumi river basin. Mr. Maina has sufficient understanding of low water flow observation, high water flow observation, actual operation of observatory and regional specific problem of flooding, cooperating with District Commissioner Office.

Mr. Tsukahara recognized such person as having knowledge of site conditions was in charge at WRMA.

It was confirmed that WRMA implemented high water flow observation which is most important work in the flood management, however, also revealed that only one equipment was provided at Machakos of WRMA regional office and found difficulty of frequent operation. He suggested the necessity of accumulating records of high water flow observation and equipment provision in the future.

Mr. Maina showed map of Lumi river basin where damages occurred by flooding while site survey. He explained outstanding matters due to flooding despite of no map or topography at the site. He explained adequate map and topography would contribute to more appropriate flood management.

3) Meeting with District Commissioner in Taveta

The commissioner raised importance of flood management and appreciated Mr. Tukahara's cooperation in the Project. The commissioner commented "Pre-caution and warning system is not required in the Lumi river basin since the problem is insufficient drainage at its downstream areas. People evacuated when flooding without injury, but inundation lasted long. All what we need is countermeasure against drainage for the flood management."

Inundation with low flow velocity due to topographic characteristics in the Lumi river basin, tends to last for long time. The commissioner's comment was reasonable.

Problems owing to flood have different substances in the respective 3 basins in the pilot project, therefore, he suggested the flood management should cope with respective local conditions not by comprehensive countermeasure to be established by the central authority.

5.2.3 Short term expert (Mr. Hidetomi OI)

(1)Purpose

He was responsible for instructing the warning and evacuation as to flood pre-caution and warning system by utilizing simple precipitation meter and simple water level indicator, as well as their operational method.

(2)Time Assigned

Period assigned: August 12, 2013 to August 20, 2013, and October 14, 2013 to October 29, 2013

(3)Outline of Activities

First Assignment:

He participated in the Integrated Flood Management River Basin Committee Meeting for Isiolo and Lumi rivers, and performed reconnaissance of those river basins.

He summarized recommendations as to arrangement of early warning at community based on the reconnaissance and opinion exchange among the persons concerned, as follows.

Table 5.2-3 Arrangement of Early Warning System at Community (draft)

2013	2014	2015～2020	2020～2045
Project Implementation		Post-Project	
■Formation of technical team for manufacture, repair and improvement of the equipment ■Technical transfer to the technical team (workshop) ■Installation, operation and improvement of the equipment at Isiolo and Lumi ■Preparation for country-wide application	■Implementation of pilot projects at remaining 4 basins in order to cope with the project's higher target : Application of flood management to 6 basins in 3 to 5 years after project completion -Nyando river / Lake Victoria South CA -Rift Valley CA -Lake Victoria North CA -Tana CA		■Application to other rivers than pilot project rivers for 6 basins to cope with "Post 2015 Frame-work for DRR (2015 – 2045)" to be approved at World Council for Disaster Prevention in 2015

Source : Mr. Hidetomi OI, "The Frist dispatch of short term expert Report

Second Assignment:

He made explanation as to method and example of warning and evacuation at the training in the first stage held in Nairobi, including preparatory measures and usual preparation required for successful warning and evacuation as well as cultivation of disaster prevention understanding.

Mr. Ohi together with Mr. Ohmachi instructed equipment provision and its operation in the Isiolo sub-basin and Lower Lumi sub-basin.

5.2.4 Short term expert (Mr. Toshikatsu Omachi)

(1)Purpose

He was in charge of instructing manufacture and outdoor installation of simple precipitation meter and simple water level indicator utilized for pre-caution and warning against flood.

(2)Time Assigned

Period assigned: October 14, 2013 to October 29, 2013

Table 5.2-4 Field Activities Extended by Mr. T. Ohmachi

Date	Activity
OCT/14 (MON)	Leave Japan
OCT/15 (TUE)	Arrive in Nairobi, Workshop location, Purchase of tools, etc.
OCT/16 (WED)	Workshop : Day 1 (Monitoring, Manufacture of Precipitation Meter)
OCT/17 (THU)	Workshop : Day 2 (Completion of Precipitation Meter, Manufacture of Water Level Indicator)
OCT/18 (FRI)	Workshop : Day 3 (Participation in seminar, Opinion exchange with Project Team and Experts)
OCT/19 (SAT)	Preparation of reconnaissance
OCT/20 (SUN)	Move to Isiolo, Survey of candidate sites for equipment
OCT/21 (MON)	Installation of precipitation meter, Check of existing meter
OCT/22 (TUE)	Preparation of report, Arrangement of equipment for Lumi, Internal meeting
OCT/23 (WED)	Move to Lumi (Taveta), Survey of candidate site for water level indicator, Material procurement
OCT/24 (THU)	Survey of the candidate site, Material procurement, Installation of water level indicator and precipitation meter
OCT/25 (FRI)	Installation of precipitation meter, Visit stakeholders at downstream
OCT/26 (SAT)	Return to Nairobi, Meeting with Project Team
OCT/27 (SUN)	Preparation of report
OCT/28 (MON)	Report to JICA Nairobi Office, Visit KRCS, Leave Kenya
OCT/29 (TUE)	Arrive in Japan

(3)Outline of Activity

He held the workshop in Nairobi for manufacturing precipitation meter and water level indicator, where he instructed principle and mechanism of the equipment referring to the drawings including material procurement. Lectures were made in the course of practical training with questions/answers, and the equipment was successfully manufactured.

Three parties consisting of 3 trainees in one party were organized with group leaders in order for them to achieve know-how of the equipment and to let other WRMA members transfer the learning. 2 persons out of 3 leaders were from KRCS voluntarily participated, who are expected to activate in the future as the facilitators.

Following the workshop, those persons moved to the site and received further training for equipment installation. Firstly survey of the candidate sites recommended by the local personnel, and some equipment was installed under the supervision of Mr. Ohmachi.

Remaining equipment was to be installed by the KRCS volunteers.

Those procedures were applied to the Isiolo sub-basin and Lower Lumi sub-basin for the personnel of WRMA, WRUA, KRCS and for local voluntary persons.

Chapter 6 Promotion of activities

6.1 Delivery of News Letters

The Project Team prepared and delivered News Letters as to the activities having done by the Project Team, WRMA and WRUA, which were notified at WRMA head office and distributed to JCC, participants of the workshop and IFMC (Integrated Flood Management Committee).

IFM Newsletter Issue No.009 — 28th August, 2013

INSIDE THIS ISSUE:

THE SECOND INTEGRATED FLOOD MANAGEMENT COMMITTEE MEETINGS IN ISIOLO AND LUMI

The purpose of the Integrated Flood Management Committee (IFMC) is to give all stakeholders a platform where they can share their opinions through discussions. It is imperative that the shared stakeholders' opinions be reflected in the finalized Integrated Flood Management Plan for the River Basin.

The first Integrated Flood Management Committee for Isiolo and Lumi River Basin were held in January and February 2013 respectively. In the first IFMC meetings in the two river basins the stakeholders agreed that the JICA Project Team in collaboration with WRMA should prepare Integrated Flood Management Plan for the respective river basins.

The draft Integrated Flood Management (IFM) Plan for Isiolo and Lumi River Basin were thereafter prepared and in June and July the plans were shared with the stakeholders through the steering committee meetings in Isiolo and Lumi river basins respectively. It was thereafter agreed that the draft IFM Plans should be presented to the stakeholders during second IFMC meeting.

The second IFMC meeting for Isiolo and Lumi river basins were therefore held on 14th and 16th August 2013 respectively.

The expected output of the 2nd IFMC Meeting in Isiolo and Lumi river basins was that each IFMC reach a consensus by the respective stakeholders on the pilot project structural countermeasure that was going to be implemented in the respective river basin.. The stakeholders were to share their opinions on the integrated flood management plan. The stakeholders of the respective river basins were mobilized a week earlier before the dates of the 2nd IFMC meetings.

Various materials were prepared and distributed by JICA Project Team during the two meetings.

Among the materials distributed included: the IFM Newsletter Issue 008, JICA Kenya Newsletter, Nyando River Basin and Lower Gucha Migori Exchange Visit report, the IFMC Plan PowerPoint presentation, the list of structural countermeasures among other materials.

Both the Isiolo IFMC and Lumi IFMC were well attended by the various stakeholders with JICA Project Team led by the Team Leader and Chief Advisor, WRMA was led by delegation from Headquarter, JICA headquarters led by Ms. Kikuiri and JICA Kenya led by Ms. Fukai, WRUA members and in Lumi a representative of Taveta County Governor also attended. The stakeholders included the WRUA members, County Government, NEMA, community opinion leaders, concerned government line ministries and institution, and non-governmental organizations (NGOs).

At the end of the two IFMCs meetings the stakeholders reached a consensus on the countermeasure to be implemented. Mr. Sawa the Project Team Leader explained to

Fig. 6.1-1 News letter

Details are referred to Appendix 4-6.

6.2 Utilization of Mass Communication

The Project Team was interviewed by the local television broadcast QTV regarding FEWS on May 4, 2014, followed by broadcasting of precipitation meter and water level indicator installed at Kabalanet.

Interview by QTV

6.3 Distribution of Video

Ceremony for training certification award in Japan was recorded on video tape in November 2013. Taking-over ceremony of the structures for flood-countermeasure at Isiolo and Lumi was also recorded. These videos were compiled into DVD and distributed to WRMA, WRUA and local personnel concerned.

Ceremony for Training Certification Award

Ceremony for Taking-over of the Structures

6.4 Uploading of Video Posting Site

Construction of the structures against flood was finished at Taveta area in the Lumi river basin in March 2014. Completion ceremony of it and short skit promoting flood countermeasure played at Eldoro Primary School were uploaded on the internet posting site for promotion.

Motion Picture on the Internet site

6.5 Distribution of News through Social Network Service

The Project Team composed informative news on the Facebook, entitled “Flood Kenya”, in

January 2014 introducing site survey done by the Project Team with related Authorities, flood occurred thereafter and events executed at WRMA on the flood management.

Facebook Page "Flood Kenya"

Republic of Kenya
Project on Capacity Development
for
Effective Flood Management
in Flood Prone Areas

Attached documents
of
Final Report

List of Attached documents

1. PDM
2. Work flow
3. Plan of operation
4. Dispatching schedule
5. Documents of counterpart training course
6. Certificate of handover
7. Minutes of Joint Coordinating Committees
   - 7.1 Minutes of 1st JCC
   - 7.2 Minutes of 2nd JCC
   - 7.3 Minutes of 3rd JCC
   - 7.4 Minutes of 4th JCC
   - 7.5 Minutes of 5th JCC
   - 7.6 Minutes of 6th JCC

1. PDM

Attachment 1

Project Design Matrix Version 2 Creation date: 8 October 2013

Project Name: The Project on Capacity Development for Effective Flood Management in Flood Prone Area Duration: July 2011 – June2014 (3 years)

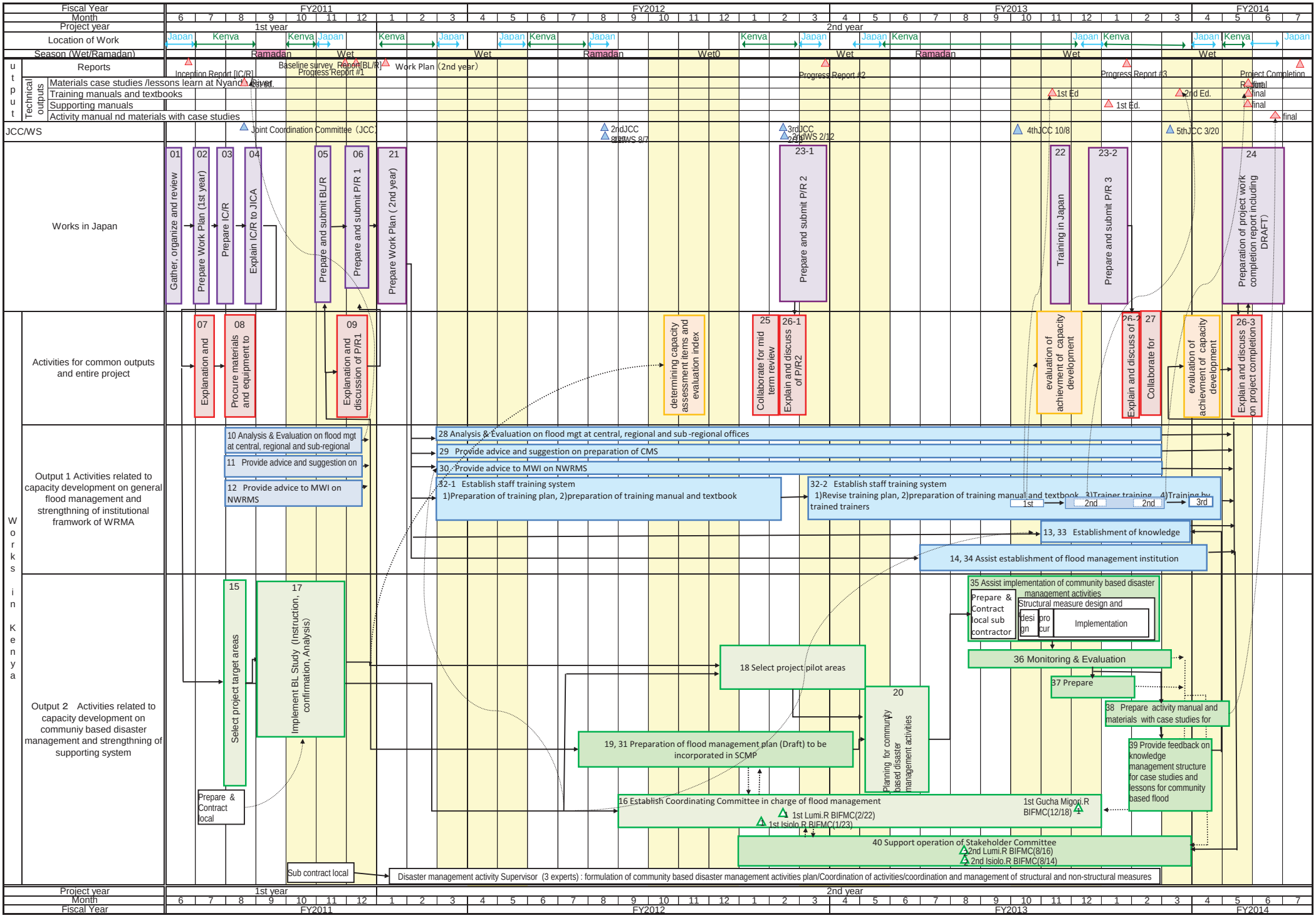
Target Group: Working Group in WRMA

	Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal	Institutional framework of flood management in the context of integrated water resource management is expanded to all of the six catchments.	・ WRMA's Strategic Plan properly addresses flood management. ・ WRMA staff in charge of flood management has capacity to implement community based activities in the six catchments. ・ Flood management is incorporated in CMS and SCMP of flood prone areas in the six catchments ・ WRMA's knowledge management mechanism (knowledge management) and training system function covering the six catchments are established. ・ Budget for flood management is secured in the six catchments.	・ Strategic Plan of WRMA ・ Training records and performance appraisal records ・ CMS and SCMP ・ WRMA's activity records and training records ・ ・Financial records	GOK maintains its strategy to promote flood management.
Project Purpose	In the Project target areas, institutional framework of flood management in the context of integrated water resource management is established for effective and sustainable implementation of community based activities.	・ Staff of WRMA in charge of flood management in the project target areas has capacity to implement community based activities. ・ Flood management is incorporated in CMS and SCMP of flood prone areas in the project target areas. ・ WRMA's knowledge management mechanism (knowledge management) and triaging system function covering the project target areas are established. ・ Budget for flood management is secured in the project target areas.	・ Training records, project records and performance appraisal records. ・ Strategies and plans in the project target areas. ・ WRMS's activity records and training records ・ Financial records	Budget and personnel for flood management is allocated as planned.
Outputs	1) At each level of WRMA (headquarters, regional offices and sub-regional offices), sustainable organizations in charge of flood management are strengthened.	1-1 A future plan of WRMA on flood management covering personnel, budget and function is prepared. 1-2 Catchment Management Strategies (CMSs) in the Project target areas properly integrate flood management. 1-3 Training plan, training material and trainers are prepared. 1-4 More than 12 % (40 numbers out of 319 technical staffs) of WRMA technical staffs attend training course by the end of this Project. 1-5 WRMA's institutional setup and budgetary systems for flood management are clearly defined and operated in the Project target areas.	1.1 Project records 1.2 CMS 1.3 Project records 1.4 Project records 1.5 Project records and financial records	・ Trained staff continue working for WRMA ・ Residents in the pilot areas cooperate to the Project.
	2) For promoting community based activities of flood management, capacity of WRMA to support WRUAs and communities is strengthened.	2-1 Flood management plans in the pilot areas are prepared. 2-2 Materials describing the cases and lessons of the community based flood management activities are prepared. 2-3 More than 25 number of WRMA staffs have experience of community based flood management activities in the Project target areas.	2.1 Project records 2.2 Project records 2.3 Project records	

Activities	(1-1) Working Group (WG) analyzes the actual state of flood management at national, regional and sub-regional level respectively. (1-1-1) Institutional framework (1-1-2) Budget arrangement (1-1-3) Personnel allocation (1-1-4) Good practices (1-2) WRMA formulates a future plan of WRMA on flood management including personnel, budget and strategy. (1-3) WRMA elaborates Catchment Management Strategy (CMS) including flood management. (1-4) WRMA advises MWI to include a chapter of flood management in the National Water Resource Management Strategy (1-5) WRMA establishes a training system for WRMA staff. (1-5-1) Formulation of a training plan (1-5-2) Preparation of training manuals (1-5-3) Implementation of training courses for trainers (1-5-4) Implementation of training courses by the trainers (1-5-5) Evaluation and feedback of the outcomes from the training courses (1-5-6) Contribution to the relevant organization in terms of implementation of training courses (1-6) WRMA institutionalizes knowledge management mechanism at regional level and sub- regional level respectively (1-7) WRMA establishes institution and budgetary systems to address flood issues.	Inputs <u>Japan side</u> 1. Experts a) Chief Advisor / Flood management administration b) Flood management technology c) Community based disaster management d) Promotion of disaster management activity e) Institution / Training The other field will be considered when necessity arises 2. Equipment a) Office equipment（Personal computer and printer etc.） b) Project vehicles 3. C/P training in Japan 4. Facilities and equipment for community based activities a) sub-contracting cost for local consultant b) material and equipment cost for community based activities	<u>Kenya side</u> 1. Personnel allocation from Counter Part (C/P) a) Joint Coordinating Committee (JCC) b) Working Group (WG) 2. Budget allocation 3. Office Space and Facilities a) Office space b) Depot space for construction materials, vehicles and other necessary equipment 4. Local cost	Flood management Unit is established.

	(2-1) WRMA determines pilot sub-catchments. (2-2) WG establishes a coordinating function among relevant stakeholders such as flood management forum. (2-3) WRMA analyzes the current situations of communities.(Baseline survey) (2-3-1) Capacity assessment of community on flood management (2-3-2) Risk analysis including flood disaster map (2-4) JCC determines pilot areas based on a baseline survey. (2-5) WG facilitates communities to prepare flood management plans in the pilot areas to be integrated in Sub-Catchment Management Plan (SCMP) (2-5-1) Study on good practices (2-5-2) Participatory planning (2-6) WG supports the implementation of community based activities based on the flood management plans. (2-7) WG monitors and evaluates the community based activities. (2-8) WG prepares materials describing the cases and the lessons based on the community based activities. (2-9) WG contributes the cases and the lessons of the community based activities to the knowledge management mechanism.			

2. Work flow


Fiscal Year
FY2011
FY2012
FY2013
FY2014
Month
6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7
Project year
1st year
2nd year
Location of Work
Japan Kenya Kenya Japan Kenya Japan Japan Kenya Japan Kenya Japan Japan Kenya Japan Japan Kenya Japan Kenya Japan Kenya Japan
Season (Wet/Ramadan)
Ramadan Wet Wet Wet Ramadan Wet0 Wet Wet Ramadan Wet Wet
output
Reports
Inception Report [IC/R]
Baseline survey Report[BL/R]
Progress Report #1
Work Plan（2nd year）
Progress Report #2
Progress Report #3
Project Completion Report
Technical outputs
Materials case studies /lessons learn at Nyando River
1st Ed.
Training manuals and textbooks
1st Ed
2nd Ed.
Supporting manuals
1st Ed.
final
Activity manual nd materials with case studies
final
JCC/WS
Joint Coordination Committee（JCC）
2ndJCC
3rdJCC
2ndWS 2/12
4thJCC 10/8
5thJCC 3/20
Works in Japan
01 Gather, organize and review
02 Prepare Work Plan (1st year)
03 Prepare IC/R
04 Explain IC/R to JICA
05 Prepare and submit BL/R
06 Prepare and submit P/R 1
21 Prepare Work Plan (2nd year)
23-1 Prepare and submit P/R 2
22 Training in Japan
23-2 Prepare and submit P/R 3
24 Preparation of project work completion report including DRAFT)
Works in Kenya
Activities for common outputs and entire project
07 Explanation and
08 Procure materials and equipment to
09 Explanation and discussion of P/R1
determining capacity assessment items and evaluation index
25 Collaborate for mid term review
26-1 Explain and discuss of P/R2
evaluation of achievment of capacity development
26-2 Explain and discuss of
27 Collaborate for
evaluation of achievment of capacity development
26-3 Explain and discuss on project completion
Output 1 Activities related to capacity development on general flood management and strengthning of institutional framwork of WRMA
10 Analysis & Evaluation on flood mgt at central, regional and sub-regional
11 Provide advice and suggestion on
12 Provide advice to MWI on NWRMS
28 Analysis & Evaluation on flood mgt at central, regional and sub -regional offices
29 Provide advice and suggestion on preparation of CMS
30 Provide advice to MWI on NWRMS
32-1 Establish staff training system
1)Preparation of training plan, 2)preparation of training manual and textbook
32-2 Establish staff training system
1)Revise training plan, 2)preparation of training manual and textbook 3)Trainer training 4)Training by trained trainers
1st
2nd
2nd
3rd
13, 33 Establishment of knowledge
14, 34 Assist establishment of flood management institution
Output 2 Activities related to capacity development on communiy based disaster management and strengthning of supporting system
15 Select project target areas
17 Implement BL Study (Instruction, confirmation, Analysis)
18 Select project pilot areas
19, 31 Preparation of flood management plan (Draft) to be incorporated in SCMP
20 Planning for community based disaster management activities
35 Assist implementation of community based disaster management activities
Prepare & Contract local sub contractor
Structural measure design and
desi gn
pro cur
Implementation
36 Monitoring & Evaluation
37 Prepare
38 Prepare activity manual and materials with case studies for
39 Provide feedback on knowledge management structure for case studies and lessons for community based flood
Prepare & Contract local
16 Establish Coordinating Committee in charge of flood management
1st Lumi.R BIFMC(2/22)
1st Isiolo.R BIFMC(1/23)
1st Gucha Migori.R BIFMC(12/18)
40 Support operation of Stakeholder Committee
2nd Lumi.R BIFMC(8/16)
2nd Isiolo.R BIFMC(8/14)
Sub contract local
Disaster management activity Supervisor (3 experts) : formulation of community based disaster management activities plan/Coordination of activities/coordination and management of structural and non-structural measures

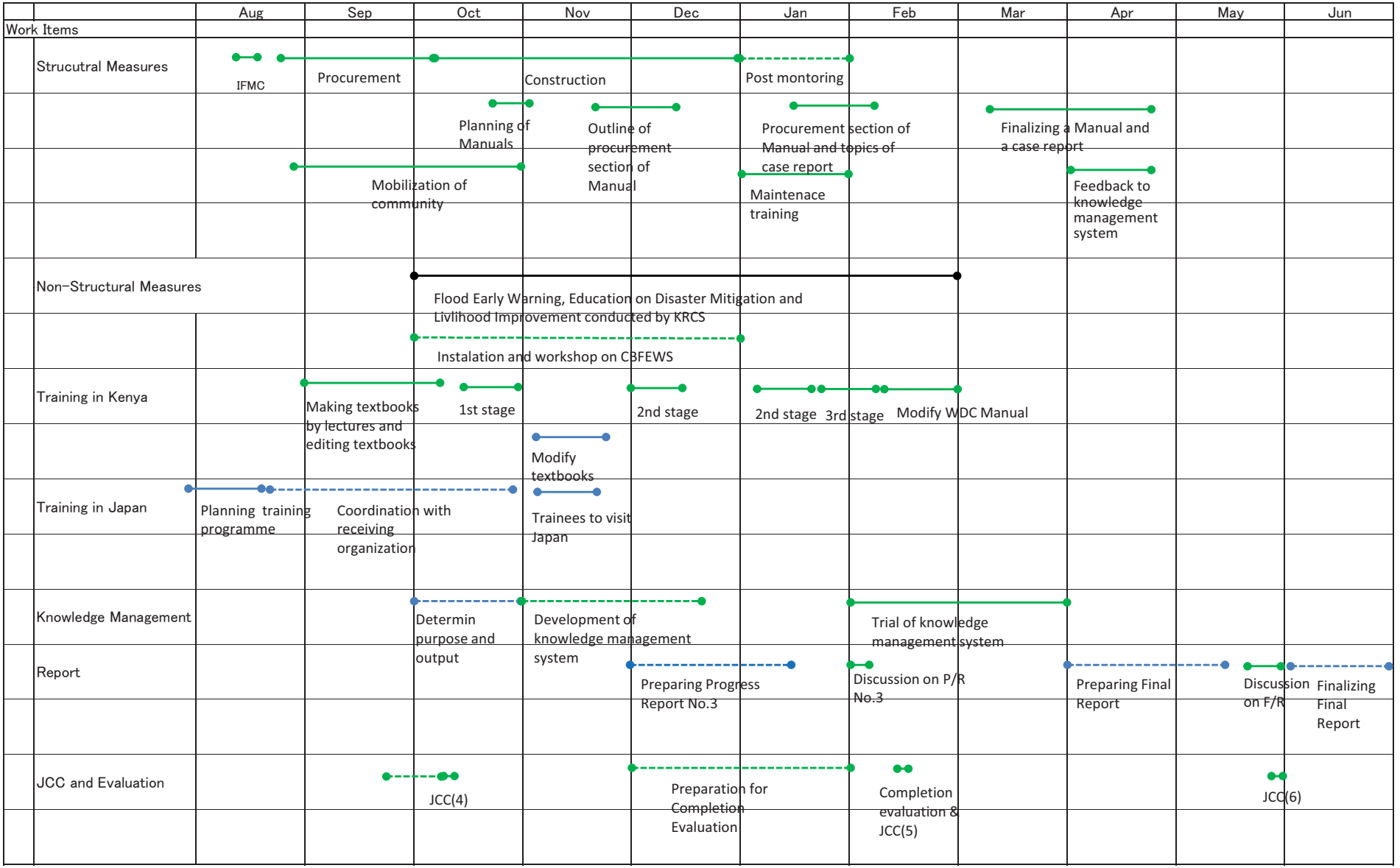
3. Plan of operation

Attachment 2

Work Plan

Project Name: The Project on Capacity Development for Effective Flood Management in Flood Prone Area

8 October 2013



4. Dispatching schedule

Dispachng Schedule

Republic of Kenya, Project on Capacity Development forEffective Flood Management in Flood Prone Areas

	Name (Assignment)		Trip	FY 2011 6 7 8 9 10 11 12	FY 2012 1 2 3 4 5 6 7 8 9 10 11 12	FY 2013 1 2 3 4 5 6 7 8 9 10 11 12	FY 2014 1 2 3 4 5 6 7 8 9	Days	M/M	Days	M/M
				1st Contract	2nd Contract			Hajime KOBAYASH		Katsro KONDO	
	Hajime KOBAYASHI (Chief Advisor)	Plan	1					540	18.00		
		Actual	1					540	18.00		
	Katsro KONDO (Chief Advisor)	Plan	1							570	19.00
		Actual	1							570	19.00
	Works in Kenya, Total	Plan						540	18.00	570	19.00
		Actual						540	18.00	570	19.00

	Name (Assignment)		Trip	FY 2011 6 7 8 9 10 11 12	FY 2012 1 2 3 4 5 6 7 8 9 10 11 12	FY 2013 1 2 3 4 5 6 7 8 9 10 11 12	FY 2014 1 2 3 4 5 6 7 8 9	Days	MM	Days	MM
				1st Contract	2nd Contract			1st Contract		2nd Contarct	
1Work in Kenya	Hideki SAWA (Team Leader / Disaster Management Activity Promotion Expert)	Plan	8	(67) (30)	(50) (64) (36)	(53) (57) (28)	(65) (15)	97	3.23	368	12.27
		Actual	8 +[1]	1/30 3/19 (50) 6/4 8/9 [3] (64) 11/11 12/16 (36)	1/8 (53) [44] 4/14 6/23 [77] 11/2 (57) 11/24 12/21 (28)	1/15 (65) 4/26 [37] 5/14 6/30 [49] 7/19 (15) 8/2		97	3.23	368	12.27
	Masaru ARAKIDA (Community Based Disaster Management Expert)	Plan	6	(30) (30)	(53) (60)	(28) (13) (21)	(27) (37)	60	2.00	239	7.97
		Actual	6 +[1]	3/4 (53) 4/2 7/16 (60) 9/13	2/1 (28) 2/28 10/2 11/2 (13) 11/2 12/1 (21)	1/13 (27) 2/8 3/11 (37) 4/16		60	2.00	239	7.97
	Msayuki INOUE (Institution/ Training Expert)	Plan	5	(45) (30)	(38) (45)	(38) (19) (20)		75	2.50	160	5.33
		Actual	4 +[1]	2/5 3/13 (38) 7/8 8/3 [9] (45)	1/8 2/22 (38) [8] 6/30 7/18 (19) 10/5 10/2 (20)			75	2.50	160	5.33
	Taketoshi MATSUNAGA (Institution/ Training Expert 2)	Plan	0		(21)			0	0.00	21	0.70
		Actual	1		9/16 10/6 (21)			0	0.00	21	0.70
	Yukihiro MIKUMO (Disaster Management Activity Promotion /Community Based Disaster Management Assistant)	Plan	7	(53) (60) (15)	(52) (40) (24)	(53) (15)		0	0.00	312	10.40
		Actual	7 +[2]	2/5 3/28 (53) 4/16 6/24 [10] (60) 7/12 8/30 [50] 9/17 10/15 [14] (15)	1/8 2/28 (52) 6/25 8/23 [20] (40) 9/30 10/3 [8] (24)	2/2 4/16 [21] 7/19 8/2 (53) (15)		0	0.00	312	10.40
	Works in Kenya, Total	Plan						232	7.73	1100	36.67
		Actual						232	7.73	1100	36.67

Legend: Actual; Plan; Additional Work

5. Documents of the counterpart training course

Japan International Cooperation Agency
(JICA) Kenya Office
P.O. Box 50572-00200 Nairobi, Kenya
TEL: +254-20-2775000
FAX: +254-20-2724878 / 2718202

Ref. No. TA-25-219 (JG)

Date: 26 September 2013

Principal Administrative Secretary
Directorate of Public Service Management
Ministry of Devolution & Planning
P.O. Box 30050
NAIROBI
ATTN: MS. JUSTER NKOROI

Dear Madam

COUNTERPART TRAINING COURSE – EFFECTIVE COMMUNITY BASED FLOOD MANAGEMENT

With regard to training in Japan for foreign participants, I am pleased to inform you that **fifteen (15) nominees (see attached list) from institutions under the Ministry of Environment, Water and Natural Resources** will be considered for the below course to be held in Japan:

EFFECTIVE COMMUNITY BASED FLOOD MANAGEMENT

The training is scheduled to take place from **9 November 2013 to 27 November 2013.** More information regarding the course information and proposed applicants are attached to this letter

Application Forms for the JICA Training & Dialogue Program should be completed and returned to this office through the Directorate of Public Service Management (DPSM) not later than:

11 OCTOBER, 2013

Yours faithfully

Koji NODA
Senior Representative
JICA Kenya Office

Enc.

Principal Administrative Secretary
Directorate of Public Service Management
Ministry of Devolution & Planning
NAIROBI
ATTN: MS. JUSTER NKOROI

COUNTERPART TRAINING COURSE – EFFECTIVE COMMUNITY BASED FLOOD MANAGEMENT

c.c. Principal Secretary
Ministry of Finance
P.O. Box 30007
NAIROBI
ATTENTION: MRS. D. KIMEU

Principal Secretary
Ministry of Environment, Water and Natural Resources
NAIROBI

Director
Water Resource Management Authority (WRMA)
NAIROBI

Head
Lower Gucha Migori Water Resource Users Association
MIGORI

Head
Isiolo Water Resource Users Association
ISIOLO

WATER RESOURCES MANAGEMENT AUTHORITY

NHIF Building, 9th Floor, Wing B
P.O. Box 45250 - 00100, Ngong Road
Nairobi - Kenya

Tel: +254-020-2732291/2729048/9
Fax: +254-020-2729950
Email: wrma@wrma.or.ke
Website: www.wrma.or.ke

Ref: WRMA/HQ/1/5/3/Vol.27/109

Date: October 3, 2013

The Principal Secretary
Ministry of Environment, Water&
Natural Resources
NAIROBI

RE: TRAINING COURSE IN JAPAN

The following officers have been identified to attend a training course in Japan titled "Effective Community Based Flood Management".

S/No.	Name Of Officer	Position	Institution
1.	Eng. Wilfred Ochenge Matagaro	Dep. Tech. Cord. Manager	Water Resources Management Authority
2.	Mr. Alexander Nzyuko	Dep. Tech. Cord. Manager	Water Resources Management Authority
3.	Mr. Peterson Njiru	Ass. Tech. Cord. Manager	Water Resources Management Authority
4.	Ms. Elizabeth Akinyi Diego	Ass. Tech. Cord. Manager	Water Resources Management Authority
5.	Ms. Rose Akinyi Nyamori	Ass. Tech. Cord. Manager	Water Resources Management Authority
6.	Mr. Stephen Ngao	Ass. Tech. Cord. Manager	Water Resources Management Authority
7.	Mr. Timothy Mutie	Ass. Tech. Cord. Manager	Water Resources Management Authority
8.	Mr. Joseph Boit	Catchment Management Officer	Water Resources Management Authority
9.	Mr. Joseph Maina	Catchment Management Officer	Water Resources Management Authority

10.	Mr. Abraham Gitonga	Catchment Management Officer	Water Resources Management Authority
11.	Mr. Samuel Njihia	Catchment Management Officer	Water Resources Management Authority
12.	Ms. Nancy Cherono Koech	Hydrologist	Ministry of Environment, Water and Natural Resources
13.	Mr. Joshua Ouma Ojwang	Secretary	Lower Gucha Migori Water Resource Users Association
14.	Mr. Fredy Emanuel Reuna	Secretary	Lower Lumi Water Resource Users Association
15.	Mr. David Nabea Mwita	Secretary	Isiolo Water Resource Users Association

The training is for nineteen (19) days commencing from 9th to 27th November 2013. The participants include eleven WRMA staff, one MEWRN staff and three WRUA officials. Enclosed herewith please find the participants' duly complete forms for your necessary action.

Eng. Philip J. Olum, HSC
CHIEF EXECUTIVE OFFICER

7 October 2013

REPUBLIC OF KENYA
PROJECT ON CAPACITY DEVELOPMENT
FOR
EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREA
Training course in Japan

1. Title

Effective Community Based Flood Management

2. Purpose

(1) To understand the background and outline of administrative system of flood management in Japan
(2) To understand the background and outline of community based flood management in Japan
(3) To understand roles and efforts of governmental organizations/institutions to support communities to conduct community based flood management activities
(4) To understand roles and efforts of community leaders for conducting community based flood management activities

3. Main Visiting Organization/ Institution

Kouhu River and Road Office, Kanto Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
Yodo River Office, Kinki Regional Development Bureau, MLIT
Yodo River Integrated Dam Group Operation Office, Kinki Regional Development Bureau, MLIT
Biwako Office, Kinki Regional Development Bureau, MLIT
Yamato River Office, Kinki Regional Development Bureau, MLIT

4. Time and Duration

19 days from 9 November 2013 to 27 November 2013.

5. Prospective Candidates

	Name of Officer	Position	Institution
1	Mr. Wilfred Ochenge Matagaro	Dep. Tech. Cord. Manager	Water Resources Management Authority
2	Mr. Alexander Nzyuko	Dep. Tech. Cord. Manager	Water Resources Management Authority
3	Mr. Peterson Njiru	Ass. Tech. Cord. Manager	Water Resources Management Authority
4	Ms. Elizabeth Akinyi Diego	Ass. Tech. Cord. Manager	Water Resources Management Authority
5	Ms. Rose Akinyi Nyamori	Ass. Tech. Cord. Manager	Water Resources Management Authority
6	Mr. Stephen Ngao	Ass. Tech. Cord. Manager	Water Resources Management Authority
7	Mr. Timothy Mutie	Ass. Tech. Cord. Manager	Water Resources Management Authority
8	Mr. Joseph Boit	Catchment Man. Officer	Water Resources Management Authority

9	Mr. Joseph Maina	Catchment Man. Officer	Water Resources Management Authority
10	Mr. Abraham Gitonga	Catchment Man. Officer	Water Resources Management Authority
11	Mr. Samuel Njihia	Catchment Man. Officer	Water Resources Management Authority
12	Ms. Nancy Cherono Koech	Hydrologist	Ministry of Environment, Water and Natural Resources
13	Mr. Joshua Ouma Ojwang	Secretary	Lower Gucha Migori Water Resource Users Association
14	Mr. Fredy Emanuel Reuna	Secretary	Lower Lumi Water Resource Users Association
15	Mr. David Nabea Mwita	Secretary	Isiolo Water Resource Users Association

6. Scheme

Under County-Specific Training by JICA

Table1 Schedule

No.	Date	Day	Activities	Venue	Accommodation
-	2013/11/9	Sat	Move from Nairobi to Dubai (by Air) Move from Dubai to Narita (by Air)	-	Flying Overnight
-	2013/11/10	Sun	Arrival to Narita Move to JICA Tokyo	JICA Tokyo	JICA Tokyo
1	2013/11/11	Mon	Briefing & Orientation (AM) Training Session (PM)	JICA Tokyo/ NEWJEC Tokyo	JICA Tokyo
2	2013/11/12	Tue	Training Session (All day)	NEWJEC Tokyo	JICA Tokyo
3	2013/11/13	Wed	Training Session (All day)	NEWJEC Tokyo	JICA Tokyo
4	2013/11/14	Thu	Training Session (All day)	NEWJEC Tokyo	JICA Tokyo
5	2013/11/15	Fri	Move from Tokyo to Yamanashi (by Bus) Site Visit Move from Yamanashi to Tokyo (by Bus)	Fuji River (Yamanashi Pref.)	JICA Tokyo
6	2013/11/16	Sat	Holiday	-	JICA Tokyo
7	2013/11/17	Sun	Holiday	-	JICA Tokyo
8	2013/11/18	Mon	Move from Tokyo to Osaka (by Train) Training Session (PM)	NEWJEC Osaka	Osaka City
9	2013/11/19	Tue	Site Visit	Yodo River (Osaka Pref.)	Osaka City
10	2013/11/20	Wed	Site Visit	Yodo River (Osaka Pref.)	Osaka City
11	2013/11/21	Thu	Site Visit	Yamato River (Osaka Pref.)	Osaka City
12	2013/11/22	Fri	Training Session (All day)	NEWJEC Osaka	Osaka City
13	2013/11/23	Sat	Holyday Move from Osaka to Tokyo (by Train)	-	JICA Tokyo
14	2013/11/24	Sun	Holyday	-	JICA Tokyo
15	2013/11/25	Mon	Training Session (All day)	NEWJEC Tokyo	JICA Tokyo
16	2013/11/26	Tue	Presentation of APR (AM) Certificate Hand-over Ceremony (AM) Move from Narita to Dubai (by Air)(PM)	JICA Head office	Flying Overnight
-	2013/11/27	Wed	Move from Dubai to Nairobi (by Air)	-	-

6. Certificate of handover

CERTIFICATE OF HANDOVER

PROJECT TITLE: *PROJECT ON CAPACITY DEVELOPMENT FOR EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS*

This is to certify that the equipments in the list bellow for above-mentioned project have been handed over properly as of February 6, 2012 to Water Resources Management Authority, Republic of Kenya. All equipments shall be used for the purpose of implementing the above mentioned Project's activities only.

List of Equipment

No.	Name of Item	Qty.	Unit	Place of Delivery	Date of Handover
1	Desktop Computer- Dell Optiplex 790 Including APC Back-UPS 650VA	3	Set	- Southern Shoreline-Gucha Migori (Kisii) SRO - Nolturesh-Lumi (Loitokitok) SRO - Middle Ewaso Ng'iro (Isiolo) SRO	November 10, 2011
2	Projector- Dell 1210S (2 Pcs) and Sony VPL EX100 (1 Pcs)	3	Pcs		November 10, 2011
3	Digital Camera- SONY DSC-W530 Including 2 GB Memory	3	Pcs		November 10, 2011
4	A3 Color Printer- HP Officejet K7000 A3 Printer	3	Pcs		November 24, 2011
5	Photo Copy Machine- CANON imageRUNNER ADVANCE C2020L	3	Set		February 6, 2012

澤 秀樹

Mr. Hideki Sawa
Team Leader, JICA Expert Team
NEWJEC Inc.

Ms. Rebecca K. Mutia
Procurement Officer
WATER RESOURCES
MANAGEMENT AUTHORITY

February 6, 2012

WATER RESOURCES MANAGEMENT AUTHORITY
Republic of Kenya

CERTIFICATE OF HANDOVER

PROJECT TITLE: *PROJECT ON CAPACITY DEVELOPMENT FOR EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS*

This is to certify that facilities and tools in the list bellow for above-mentioned project have been handed over properly as of 25 April 2014 to Water Resources Management Authority, Republic of Kenya.

List of Facilities and Tools

No.	Name of Item	Unit	Qty.	Place	Date of Handover
1	Riverbank protection using gabion mattress along the Eastern Marania River at Matunada Full Gospel Church	Set	1	Middle Ewaso Ng'iro (Isiolo) SRO	25 April 2014
2	Mattock complete with handle	Pcs	5	Ditto	Ditto
3	Shovel complete with handle	Pcs	5	Ditto	Ditto
4	Wheelbarrow	Pcs	5	Ditto	Ditto
5	Masons hammer	Pcs	5	Ditto	Ditto
6	Galvanised binding wire	Roll	2	Ditto	Ditto
7	Pliers	Pcs	5	Ditto	Ditto
8	Gabion Basket	Pcs	5	Ditto	Ditto
9	Raised Access Road at Eldoro Primary School	Set	1	Nolturesh-Lumi (Loitokitok) SRO	25 April 2014
10	Raised Evacuation Space at Eldoro Primary School	Set	1	Ditto	Ditto
11	Raised 2 Compartment Toilets at Eldoro Primary School	Set	1	Ditto	Ditto
12	Culvert at Eldoro Primary School	Set	1	Ditto	Ditto
13	Jembe	Pcs	5	Ditto	Ditto
14	Fork Jembe	Pcs	5	Ditto	Ditto

15	Mattock	Pcs	5	Ditto	Ditto
16	Pick Axe	Pcs	5	Ditto	Ditto
17	Spade	Pcs	5	Ditto	Ditto
18	Wheel Barrow	Pcs	5	Ditto	Ditto
19	Wooden Bar	Pcs	2	Ditto	Ditto
20	Claw Hammer	Pcs	3	Ditto	Ditto
21	Sledge Hammer	Pcs	2	Ditto	Ditto
22	Craw Bars	Pcs	2	Ditto	Ditto
23	Panga	Pcs	5	Ditto	Ditto
24	File sharpeners	Pcs	2	Ditto	Ditto
25	Slashers	Pcs	5	Ditto	Ditto
26	Plastic Can(20 Litres)	Pcs	5	Ditto	Ditto
27	Rope (1 Coil)	Coil	2	Ditto	Ditto
28	Nails	Pcs	2	Ditto	Ditto
29	Cotton Rope(1 Coil)	Coil	2	Ditto	Ditto
30	Triangle	Pcs	1	Ditto	Ditto
31	Spirit Level	Pcs	1	Ditto	Ditto
32	Compactor	Pcs	5	Ditto	Ditto

Mr. Hideki Sawa
Team Leader
JICA Project Team

Eng. John P. Olum
Chief Executive Officer
WATER RESOURCES
MANAGEMENT AUTHORITY

25 April 2014

7. Minutes of JCC

7-1 Minutes of 1st JCC

MINUTES OF MEETING
OF
THE FIRST JOINT COORDINATING COMMITTEE MEETING
ON
THE PROJECT ON CAPACITY DEVELOPMENT
FOR
EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS
IN
THE REPUBLIC OF KENYA

AGREED UPON BETWEEN
MINISTRY OF WATER AND IRRIGATION (MWI),
WATER RESOURCES MANAGEMENT AUTHORITY (WRMA)
AND
JICA EXPERT TEAM,
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Nairobi, August 19, 2011

Eng. David Stower, CBS, OGW
Permanent Secretary
Ministry of Water and Irrigation
The Republic of Kenya

Mr. Mikio Ishiwatari, PhD
Senior Advisor
Japan International Cooperation Agency

Mr. John P. Olum
Chief Executive Officer
Water Resources Management Authority
The Republic of Kenya

Mr. Hajime Kobayashi
Chief Advisor
JICA Expert Team

Mr. Hideki Sawa
Team Leader
JICA Expert Team

The first Joint Coordinating Committee meeting was held on August 18, 2011. As the result of the discussions, JCC members agreed as follows:

1. Inception Report (IC/R) was accepted.
2. Three (3) sites were selected for Project Target Areas based on the criteria as attached.

	Catchment Authority/ Regional Office	Sub Region/ Sub-Regional Office*	River Basin	Related Water Resources Users Associations (WRUAs)
1	Lake Victoria South	Southern Shoreline- Gucha Migori (Kisii)	Gucha Migori	Lower Gucha Migori WRUA
2	Athi	Nolturesh-Lumi (Loitokitok)	Lumi	Lower Lumi WRUA Upper Lumi WRUA
3	Ewaso Ng'iro North	Middle Ewaso Ng'iro (Isiolo)	Ewaso Ng'iro North	Isiolo WRUA, etc

*) Sub- Region/ Sub-Regional Office name in parentheses shows old one.

The Project will cover the formulation and revision of SCMP and CMS and to conduct countermeasures in each of the three (3) Project Target Areas. For Nolturesh-Lumi Sub-Region and Middle Ewaso Ng'iro Sub-Region, JICA will support the funds for construction works.

3. The Project was officially launched.
4. MWI will revise NWRMS to include the activities of the Project.
5. WRMA will revise CMSs to include the activities of the Project.

ATTACHED DOCUMENT

Criteria for Selecting Pilot Areas

Project on Capacity Development for Effective Flood Management in Flood Prone Areas

Province		Nyanza	Coast	Eastern
County		Migori	Taita-Taveta	Isiolo
District		Nyatike	Bomni, Jipe	Samburu
WRMA Regional Office		Victoria South	Athi	Ewaso Ngi'ro North
Targeted Catchments		Gucha, Migori	Lumi	Isiolo
		Riana, Ongoche	Soua, Ruvu	Ewaso Ngi'ro
Targeted Sub Regional Office		Southern Shoreline – Gucha Migori	Nolturesh-Lumi	Middle Ewaso Ngi'ro North
Targeted Sub Catchments		Gucha, Migori (Lower Gucha-Migori)	Lumi (Lower Lumi)	Ewaso Ngi'ro North (upper part of Archer's Post)
Score	Security	3	3	3
	Access in Rainy Season	1	1	3
	Distance from JICA expert office	1	3	3
	Flood Duration	2	3	1
	Affected People by Floods	3	3	1
	Population Density	1	2	3
	Total	11	15	14
Overall Judgement		III	I	II

Fact Sheet for Selecting Pilot Areas

Project on Capacity Development for Effective Flood Management in Flood Prone Areas

August (8, 2011

	Province		Nyanza	Coast	Eastern	
	County		Migori	Taita-Taveta	Isiolo	
	District		Nyatike	Bomni, Jipe	Samburu	
	WRMA Regional Office		Victoria South	Athi	Ewaso Ngi'ro North	---
	Targeted Catchments		Gucha, Migori	Lumi	Isiolo	
			Riana, Origoche	Soua, Ruvu	Ewaso Ngi'ro	
	Targeted Sub Regional Office		Southern Shoreline – Gucha Migori	Nolturesh-Lumi	Middle Ewaso Ngi'ro North	
	Targeted Sub Catchments		Gucha, Migori (Lower Gucha-Migori)	Lumi (Lower Lumi)	Ewaso Ngi'ro North (upper part of Archer's Post)	Remarks
A	Security		good	good	good	
	Access in Rainy Season		bad	bad	good	
	Accommodation		fair	good	good	
B	Annual Amount of Rain	mm	(Upper) 800-2,200 (Lower) 200-800	400-800	350-750	
	Annal Mean Discharge	m^3/s	804[1]	N/A	N/A	[1]max. in '69-'08
	Main Rivers		Gucha River Migori River	Lumi River	(Ewaso Ngi'ro R.)[2]	[2]upper part of Archer's Post
	Type of Floods		Slow	Slow & Flash	Flash	
	Flood Duration	months	3~4	2~6	< 1	
	Affected People by Floods	annual	5000-10,000	10,000	1,000	
	Fatal Victims in Floods	annual	0	3[3]	10[4]	[3]annual average [4]2005
C	Target Sub Regional Offices		1	1	1	
	Total Staff		10	9	9	
	Technical Staff		7	5	5	
D	Targeted Sub Catchments		Gucha-Migori	Lumi	(Ewaso Ngi'ro)[2]	[2]upper part of Archer's Post
	Population		---	---	---	
	Sub Catchments Area	km^2	---	---	---	
	Population Density	$/km^2$	low	medium	high	
	CMS		existing	existing	existing	
	SCMP		existing	existing	existing	
	Existence of WRUA		existing	existing	existing	
	Activities of NGO		active	very active	N/A	
	Forum of WRUAs		non	non	existing	
	Number of targeted WRUAs		2	2	1	
	Name of related WRUAs		Lower Gucha-Migori	Lower Lumi	Isiolo	
			Middle Gucha-Migori	Upper Lumi		
	Evacuation Centers		5 (no shelters)	none	none	
	Amount of WSTF in '08/'0	Ksh	0	0	0	
	Amount of WSTF in '09/'1	Ksh	624,600	521,500	0	
	Amount of WSTF in '10/'1	Ksh	0	0	727,100	
E	Mountains		Mau Sumit	Mt. Kilimanjaro	Mt. Kenya Aberdares Range	
	Lake		Lake Victoria	Lake Jipe	none	
	Type of Water Body		Int'l Lake	Int'l River & Lake	Domestic River	
	Negotiation with Foreign Country		No	Yes	No	
F	Flood Infrastructures		Water Gauges	Water Gauges	Water Gauges	
			Bridges	Bridges	Bridges	
			Culverts	Culverts	Culverts	
			Gabions	Dikes	Gabions	
				Gabions	Evaporation Gauge	
G	Supplements		Involvement of GIZ	Spread of Bilhazia	Airport Construction	
			Similar Circumstances to Nyando Catchment	Road Disconned		

PROGRAMME OF THE FIRST JOINT COORDINATING COMMITTEE OF THE PROJECT ON CAPACITY DEVELOPMENT FOR EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS

Venue: Kenya School of Monetary Studies

Date: 18th August, 2011

TIME	TOPIC	FACILITATOR
08.30 – 09.00	Registration	TM
09.00– 09.20	Introduction and Welcome remarks	Technical Manager, WRMA
09.20– 09.45	Official opening speech	PS, MWI
09.45– 10.15	Speech by JICA chief representative	JICA Chief Representative
10.15 – 10.45	**TEA BREAK**	
10.45 – 11.30	Introduction of the project	CEO -WRMA
11.30 – 12.00	Presentation of the project	Project Chief Advisor
12.00– 13.00	Plenary discussion	CEO -WRMA
13.00 – 14.00	**LUNCH BREAK**	
14.00 – 14.15	Signing of Minutes of Meeting and official launch	(PS, CEO, JICA and CA)
14.15 – 14.45	Speech by Representative, Embassy of Japan	Representative, Embassy of Japan
14.45 – 15.00	Closure of the meeting	Director of WR, MWI

LIST OF PARTICIPANTS OF THE FIRST JOINT COORDINATING COMMITTEE OF THE PROJECT ON CAPACITY DEVELOPMENT FOR EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS – SCHOOL OF MONETARY STUDIES – 18TH AUGUST, 2011

S/No.	NAME	DESIGNATION	ORGANIZATION
1.	Samuel Gor	Sub Regional Manager – Kisii Sub Region	WRMA
2.	Joseph K. Mutua	Water Resource Project Officer	WRMA
3.	Bilancio Maturwe	Ag. Regional Manager, Athi Catchment Area	WRMA
4.	Janerose W. Maina	Assistant, CMO – Nortulesh-Lumi Sub Region	WRMA
5.	Simon Wang'ombe	Regional Manager Ewaso Ng'iro North Catchment Area	WRMA
6.	John Masila Ngilu	Surface Water Officer Athi Catchment Area	WRMA
7.	John Kinyua Samuel	Catchment Management Officer - Middle Ewaso Ng'iro Sub Region	WRMA
8.	Gideon Mikwa	Catchment Management Officer - Middle Ewaso Ng'iro Sub Region	WRMA
9.	Reuben Ngessa	Ag. Surface Water Officer – Lake Victoria South Catchment Area	WRMA
10.	John Kinyanjui	Surface Water Officer - Ewaso Ng'iro North Catchment Area	WRMA
11.	Jacqueline N. Mboroki	Sub Regional Manager - Middle Ewaso Ng'iro Sub Region	WRMA
12.	Reuben Chepkonga	PO, ENVT	Water Services Trust Fund
13.	Leah Mukiite	WRUA Coordinator	WRMA
14.	James Ambuso	Finance & Administration Manager	WRMA
15.	Elizabeth Luvonga	Public Relations Officer	WRMA
16.	Francis Edalia	Operations Manager	WRMA
17.	Simintei Kooke	DD/SW	Ministry of Water & Irrigation
18.	Kelvin Mutinda	Finance Officer	Ministry of Finance
19.	William O. Ogola	DD/RM	Ministry of Regional Development

20.	Lawrence Thooko	Surface Water Officer	WRMA
21.	Eng. Joseph Kinyua	Technical Manager	WRMA
22.	Taichi Minamitani		JICA
23.	Eng. Peter Waithaka	Water Conservation Officer	WRMA
24.	Samuel Chege	Catchment Management Officer	WRMA
25.	Joseph Maina	Catchment Management Officer	WRMA
26.	Peter Njiru	CLRO	
27.	Hideki Sawa	JICA Expert	JICA
28.	Peterson Njiru	Database Officer	WRMA
29.	Masayuki Inoue	JICA Expert	JICA
30.	Masaru Arakida	JICA Expert	JICA
31.	Mikio Ishiwatari		JICA
32.	Hajime Kobayashi	JICA Expert	JICA
33.	Kenneth Irungu Mwangi	Driver	Avenue Car Hire
34.	Gerald Mwangi	Driver – Hqs	WRMA
35.	Patrick King'ori	Driver	JICA
36.	Joshia Martin	Driver – Hqs	WRMA
37.	Joshua Owich	Driver	Ministry of Water & Irrigation
38.	Joseph Mutunga	Driver – Athi Catchment Area	WRMA
39.	B. Okwiri	Driver	Ministry of Water & Irrigation
40.	Nancy Kamuri	Driver – Hqs	WRMA
41.	Dida Jillo	Driver – Ewaso Ngiro Catchment Area	WRMA
42.	Elijah Misiani	Driver – Lake Victoria South Catchment Area	WRMA
43.	Waweru Miriam	Executive Secretary	WRMA

7. Minutes of JCC

7-2 Minutes of 2nd JCC

Ministry of
Water and Irrigation

Water Resource
Management
Authority

Japan international
Cooperation Agency
Japan

MINISTRY OF WATER AND IRRIGATION (MWI)

WATER RESOURCES MANAGEMENT AUTHORITY (WRMA)

AND

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINUTES OF MEETING
OF
2ND JOINT COORDINATION COMMITTEE (2ND JCC)
ON
THE PROJECT ON CAPACITY DEVELOPMENT
FOR
EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS
IN
THE REPUBLIC OF KENYA

HELD ON TUESDAY, 7th AUGUST, 2012
AT
KCB LEADERSHIP CENTRE – KAREN, NAIROBI

Signed 27th August, 2012

MINISTRY OF WATER AND IRRIGATION (MWI)

WATER RESOURCES MANAGEMENT AUTHORITY (WRMA)

AND

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINUTES OF MEETING (M/M)
OF
2nd JOINT COORDINATION COMMITTEE (2nd JCC)

THIS MINUTE OF MEETING OF 2nd JOINT COORDINATION COMMITTEE ("2nd JCC") ON THE PROJECT ON CAPACITY DEVELOPMENT FOR EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS IN THE REPUBLIC OF KENYA ("Project") is made on the seventh day of August two thousand and twelve. **The Ministry of Water and Irrigation**, ("MWI"),and **The Water Resources Management Authority** ("WRMA") which expression shall, where the content so admits include its successors and assigns on one hand and **The Japan International Cooperation Agency** ("JICA") on the other hand which expression shall, where the content so admits includes its successors and assignees.

WHEREAS,

The conclusion and the direction of the Project for coming two years are summarized in four themes as follows.

First, in order to support to establish resilient community to floods, the following actions shall be taken:

- Counter measures to floods shall be incorporated into the Sub Catchment Management Plans, SCMPs;
- The Manual for the Water Resource Users Association Development Cycle, WDC, shall be revised in consideration of flood management;
- The number of officers who have a knowledge and experience in civil engineering shall be increased in WRMA; and
- The system to coordinate multi stakeholder shall be established.

Second, in order to minimize the number of victims by floods, the following actions shall be taken:

- Flood observation system shall be established;
- Affordable flood early warning system shall be established; and
- Effective River Gauging Stations for flood management shall be selected and continuously observed.

Third, in order to invest in flood management sector effectively, a system of formulating integrated river basin flood management plan shall be established.

Finally, in order to realize effective flood management, coordination system among various actors shall be established and the following actions shall be taken:

- Flood related information and data shall be shared;
- Various ministries and organizations related to flood management shall be well-coordinated;
- WRMA shall take a lead in flood management in Kenya; and
- WRMA shall participate in the National Platform for Disaster Risk Reduction, NPDRR.

MWI, WRMA and JICA recognizing the conclusion and the direction of the Project above now come to an understanding on collaboration arrangement for supporting through this M/M.

SIGNED AT NAIROBI BY THE DULY AUTHORIZED REPRESENTATIVES OF THE PARTIES ON THE DAY AND YEAR AS WRITTEN ABOVE

Dr. David STOWER, CBS, OGW
Permanent Secretary
Ministry of Water and Irrigation
The Republic of Kenya

Mr. Hideo EGUCHI
Chief Representative
JICA Kenya Office

Eng. John P. OLUM
Chief Executive Officer
Water Resources Management Authority
The Republic of Kenya

Mr. Hajime KOBAYASHI
Chief Advisor
JICA Project Team

for Mr. Hideki SAWA
Team Leader
JICA Project Team

THE ATTACHED DOCUMENT ON 2nd JCC MEETING

Min-1: Opening Remarks for 2nd JCC from MWI

Mr. Alexander M. Nzyuko, WRMA, is nominated as a facilitator of the 2nd JCC meeting.

Opening remarks by Mr. David K. Bosuben, who was for and on behalf of the Director of Water Resources in MWI:

He stated that Kenya and Japan have a cordial relationship and Japan has assisted Kenya in flood management. JICA is currently assisting Kenya in developing Master Plan for water resources. He pointed out that the data is a key to effective water resources development, and the support from JICA to WRMA will trickle down to communities. Participants of the 2nd JCC meeting were thereafter welcomed to bring objectives of the 2nd JCC meeting to a success. He also thanked Japan for continuous assistance that Kenya has received.

Min-2: Opening Remarks for 2nd JCC from WRMA

Opening Remarks by Eng. Joseph M. Kinyua, Technical Manager of WRMA:

The Technical Manager was representing the CEO of WRMA who was away in Mombasa on official business. He pointed out that flood and drought disaster management was the mandate of WRMA. He explained that when developing basin planning, focus is brought not only in flood management but also in holistic approach covering the entire water resources. The capacity building of WRMA will make the institution proactive that will enable WRMA to develop flood management plan based on river basin. He clarified that the Project was on course and WRMA will have gained meaningful knowledge in flood management at the end of the Project.

Min-3: Opening Remarks for 2nd JCC from JICA

Opening Remark by Mr. Kazumasa Sanui, Senior Representative of JICA Kenya Office:

He explained the objective of the Project and stated that the Project is in three pilot areas and at the end of the Project the knowledge will be replicated in six catchment areas in Kenya. He pointed out the previous projects undertaken by JICA from the Master Plan to the Community-based flood Management that was undertaken in the Nyando River Basin among 24 communities. He clarified that Japan has been affected by floods for many centuries and based on the experiences Japan is ready to share the fruitful outcomes with Kenya. He pointed out that due to climate change Kenya has been witnessing disasters brought about by extremes of the climate, either severe drought or severe floods. He gave cost estimates of climate change related disasters in Kenya. He explained that WRMA is aware that flood disaster affects multi-sectors and hence coordination is essential in building resilience in communities. He thanked the Project Team for organizing the workshop on effective flood management and the 2nd JCC meeting.

Min-4: Presentation of Progress Report No. 1 from Mr. Kobayashi

Mr. Hajime Kobayashi, Chief Advisor of JICA Project Team, gave a brief overview of the Project as follows:

He explained the significance of the Project.

He gave the history of JICA involvement in flood management since 2006.

He explained the three Project areas and pointed out the three main themes for the Project.

He explained the importance of flood observation systems in an integrated manner; that is, meteorological data with the Kenya Meteorological Department, KMD, hydrological data with WRMA and damage data with the other line ministries and the Kenya Red Cross Society, KRCS, which should be analyzed and integrated.

He explained the case example of the Gucha-Migori River Basin, whereby it was noted that there were lots of data missing. He pointed out the urgent need for proper and accurate observation and data storage.

He also clarified the need to disseminate important information to relevant organizations.

He clarified also the need to analyze on cause and effect with respect to meteorological data, hydrological data and damage data. The outcomes of the analysis can help in advising communities by WRMA.

Affordable community based Flood Early Warning System, FEWS, has been conducted in some areas, where communities can use mobile phone in case of flood and convey early warning to communities. He explained that WRMA should support communities in coming up with EFWs based on data in River Gauging Stations, RGSs, among others.

Requisite actions to establish flood observation system were also highlighted. He pointed out the importance of disseminating flood information to the public.

As for formulating a coordinated system for effective flood management, he gave analogy of flood mitigation in an area without considering the whole basin, which will ultimately cause problems to other places in the same basin.

He pointed out that there are various organizations involved in structural measures but there is no proper coordination of the activities among relevant organizations involved.

He painted the picture of sufficient coordination among various actors related to flood management.

He pointed out the necessity of "River Basin Flood Management Plan" in the draft Water Strategy and the draft Water Bill.

He defined the term "resilient community".

He further clarified the benefit of building a resilient community against floods; he pointed out the trickling-down effect of floods that leads to other crisis adding that reducing flooding will automatically reduce spinning out disasters.

Further, he explained how to guide resilient communities. Owing to building resilient community, the poverty spiral effect will be inevitably eliminated.

He further pointed out the present situations on planning flood management at community level. He pointed out that Sub Catchment Management Plans, SCMPs, have possibility to include flood management. He further pointed out the way forward to developing SCMPs.

He explained the importance of learning experiences of KRCS with respect to community participatory approach, which is considered essential to sustainable projects.

He further stated that it was important that WRMA should pass technical knowledge to WRUA.

He pointed out the necessary actions to support communities and/or Water Resources Users Associations, WRUAs, with the aim of building resilient community against floods.

In conclusion of his presentation, he laid out the direction of the Project with four themes as summarized in the Minutes of Meeting (M/M) shown above.

He also highlighted the time frame of the Project.

Min-5: Discussion on the Presentation of Progress Report No. 1 from Mr. Kobayashi

Eng. Kinyua agreed with the direction of the Project and requested that the word 'possess' in slide 30 be changed to be 'have'.

Dr. Abira's comment: she wanted to know why there was case of missing data for WRMA's RGSs in the Gucha-Migori River Basin.

Dr. Abira's another comment: why it is difficult to construct culverts by justifying the Water Service Trust Fund, WSTF?

Question: what does involving community from the beginning means in Slide 27?

Response: the community people know the relevant area more than the outsiders; lack of continuity-oriented activities at the end of the Project is often attributed to lack of involvement when the Project is conducting.

Eng Kinyua: it is important to involve communities from the beginning of the Project, which is fairly new mandate for WRMA.

Question: Lake Victoria shoreline faces flooding time and again. The District Disaster Management Committee, DDMC, and KRCS respond well, while WRMA can do little after flooding. Is WRMA expected to ask communities to evacuate?

Response: the KMD's Early Warning can be done through sensitization, though sometimes difficult for communities to accept evacuating.

Mr. Ngugi: what about the objectives needed to be ratified by Permanent Secretary? The approval of the work plan is important.

Eng. Kinyua pointed out that the 2nd JCC meeting can approve the objective and come up to a conclusion.

Min-6: A.O.B for 2nd JCC

Ms. Meri Fukai, JICA Kenya Office, congratulated the JICA Project Team for the work well done as the workshop and the 2nd JCC meeting was successful. The work

shop was the good opportunity for the different stakeholders to come together to share some of the challenges we are facing for the flood management in this country. Since one of the priority for the Project is to have better coordination between the various stakeholders for effective flood management, today was a first step, and we hope and believe that this collaboration will be strengthen. Though the issue of community based flood management is though fairly new concept, it is now gaining ground.

Mr. Hideki Sawa, Team Leader of the JICA Project Team, thanked various stakeholders that attended the meeting for cooperation towards implementation of the Project.

Mr. David Bosuben, MWI, Technical Manager of WRMA, pointed out that WRMA is developing synergy of network in flood management that will enable data sharing for effective service delivery to Kenya nation. He expressed his appreciation that various stakeholders were able to come together and discussed national matters on flood disaster.

Eng. Joseph Kinyua, WRMA, in his closing remarks, thanked the participants for fruitful workshop and a productive 2nd JCC meeting. He pointed out the new constitution, the draft Water Strategy and the draft Water Bill in essence implies that WRMA is in a transition. He also pointed out that data collection should be WRMA responsibility for the sake of it not for passing the data to the JICA Project Team. Finally, he also appreciated the role of the JICA Project Team was playing in improving and enhancing effective flood management.

LIST OF PARTICIPANTS ON 2nd JCC MEETING

No	Name	Designation / Institution	Station
1	Mr. Kazumasu SANUI	Senior RepresentativeJICA Kenya	JICA Kenya HQ
2	Ms. Meri FUKAI	JICA Kenya	JICA Kenya HQ
3	Mr. John Ngugi	JICA Kenya	JICA Kenya HQ
4	Mr. Hajime KOBAYASHI	PCDEFM Project	Nairobi
5	Mr. Hideki SAWA	PCDEFM Project	Nairobi
6	Mr. Masaru ARAKIDA	PCDEFM Project	Nairobi
7	Mr. Masayuki INOUE	PCDEFM Project	Nairobi
8	Mr. Yukihiro MIKUMO	PCDEFM Project	Nairobi
9	Mr. Clement Ngida	PCDEFM Project	Nairobi
10	Mr. Robert Owaga	PCDEFM Project	Nairobi
11	Mr. Jared Otieno	PCDEFM Project	Nairobi
12	Ms. Alacoque Achieng	PCDEFM Project	Nairobi
13	Eng. Joseph Kinyua	TM-WRMA	WRMA HQ
14	Mr. Alexander Nzyuko	DTCM-WRMA	WRMA HQ
15	Mr. Peterson Njiru	ATCM-WRMA	WRMA HQ
16	Mr. E.O. Bukachi	Assistant Director KMD	KMD HQ
17	Mr.Stephen Munyao	ATCM-WRMA	Machakos
18	Simon W. Wangombe	DTCM-ENNCA	Nanyuki
19	Dr. Margaret Abira	DTCM-LUSCA (WRMA)	Kisumu
20	Mr. Joseph Maina	CMO-WRMA	Loitoktok
21	Mr. Bilancio Maturwe	SRM-WRMA	Kisii
22	Mr. Joseph Boit	CMO-LVSC	Kisii
23	Mr. David K. Bosuben	SNR Water Researcher(MWI)	Nairobi
24	Mr. John Kinyanjui	ATCM-MEN	Isiolo

2nd Joint Coordinating Committee Meeting
on
the Project of Capacity Development for Effective Flood Management
in
Flood Prone Areas (PCDEFM)

Agenda

Date: Tuesday 7 August 2012
Time: 14:00 – 16:30 (2 h 30 min)
Venue: KCB Leadership Centre- Karen

Objectives:

- To authorize PDM indicator within 5 months of the project commencement.
- To approve the annual work plan of the project
- To review and evaluate the general progress of the project
- To exchange opinions on issues regarding the project.
- To discuss any other issues pertinent to the smooth implementation of the Project

14:00-14:15 **Registration (15 min)**

14:15-14:20: **Opening Remarks from MWI (5 min)**

14:20-14:25: **Opening Remarks from WRMA (5 min)**

14:25-14:30 **Opening Remarks from JICA (5 min)**

14:30-15:00 **Presentation of Progress Report from JICA Project Team (30 min)**

15:00-15:45 **Discussion (45 min)**

15:45-16:00: **Break (15 min)**

16:00- 16:30: **Wrap up and Closing Remarks (30 min)**

7. Minutes of JCC

7-3 Minutes of 3rd JCC

MINUTES OF MEETING

OF

THE 3rd JOINT COORDINATING COMMITTEE (JCC) MEETING

ON

THE PROJECT ON CAPACITY DEVELOPMENT

FOR

EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS

IN

THE REPUBLIC OF KENYA

AGREED UPON BETWEEN

MINISTRY OF WATER AND IRRIGATION (MWI),

WATER RESOURCES MANAGEMENT AUTHORITY (WRMA)

AND

JICA EXPERT TEAM,

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Nairobi, 13th February 2013

Eng. David Stower, CBS, OGW
Permanent Secretary
Ministry of Water and Irrigation
The Republic of Kenya

Mr. Hideo Eguchi
Chief Representative
JICA Kenya Office

Eng. John P. Olum
Chief Executive Office
Water Resources Management Authority
The Republic of Kenya

Mr. Katsuro Kondo
Chief Advisor
JICA Expert Team

Mr. Hideki SAWA
Team Leader
JICA Expert Team

The 3rd Joint Coordinating Committee (hereinafter referred to as "JCC") Meeting on the Project on Capacity Development for Effective Flood Management in Flood Prone Areas in the Republic of Kenya (hereinafter referred to as "the Project") was held on 13 February 2013. As the result of the discussions, JCC members agreed as follows;

1. Progress of the Project

1) Summary of the progress of the Project was presented by the JICA Expert Team and WRMA Flood Management Unit (hereinafter referred to as "FMU") members.
2) With respect to the indicator 1.1 and 1.5 of Project Design Matrix (hereinafter referred to as "PDM"), following JICA Expert Team's suggestions on the institutional arrangement of WRMA on the process of revising the WRMA Strategic Plan, WRMA Management submitted a proposal of establishment of Flood Management Department at the Headquarters, six (6) Regional Offices and fourteen (14) Sub-Regional Offices, and the WRMA Administrative Board approved it.
3) With respect to the indicator 1.2 of PDM, WRMA is currently making an announcement of bidding for contract to procure consulting services to revise CMSs. JICA Expert Team gave some comments to the draft TOR of the services.
4) With respect to the indicator 1.3 of PDM, JICA Expert Team made a proposal of draft WRMA Training Plan in cooperation with Human Resources Department of WRMA. But, there were still some parts to be revised.
5) With respect to the indicator 2.1 of PDM, Lower Gucha Migori WRUA has already revised Sub Catchment Management Plan (SCMP) that includes Flood Management Plan. Isiolo WRUA is now discussing about Flood Management Plan in Integrated Flood Management Committee (IFMC) of Isiolo River Basin, the first meeting of which was held on 23 January 2013. Regarding to Lower Lumi WRUA, draft Integrated Flood Management Plan is being discussed by Lower Lumi WRUA with WRMA Working Group members and JICA Expert Team. The first meeting of IFMC in Lumi River Basin will be held on 22 February 2013 and the draft Integrated Flood Management Plan will be discussed in it.
6) With respect to the indicator 2.2 of PDM, first draft of Nyando Project Case Report was prepared. But, it should be modified to show the good examples and lessons learnt more effectively.

2. Mid-Term Evaluation/Review

1) The result of the Mid-Term Review was presented by the JICA Mid-Term Evaluation Team.
2) From the five criteria of the evaluation, the relevance of the Project is very high, and the effectiveness and efficiency are relatively low due to the delay in several activities. With regard to the impact, it is difficult to predict the possibility of the achievement of Overall Goal at the moment of Mid-Term Review. However, Integrated Flood Management (IFM) approach and community-based flood management activities are expected to

expand to all the six catchments since WRMA established the Flood Management Department at all six Regional Offiecs and flood management was incorporated in his draft Strategic Plan. With regard to sustainability, it is premature to mention the prospects of project sustainability at the moment. However, it is expected that flood management activities could be continued by WRMA after completion of the Project, since there has been already positive activities by Government of Kenya (GOK).

3) Recommendations by the JICA Mid-Term Evaluation Team are;
   a) Acceleration of community-based activities;
   b) Capacity development and assessment;
   c) Exchange of ideas among WRMA and WRUAs;
   d) Establishment of Nation-wide system of information sharing and interactive learning;
   e) Utilization of local resources, and;
   f) Modification of PDM.
4) The Mid-Term Evaluation Team identified and specified pilot sites in target areas for non-structural measures and prioritized community-based flood management activities. These pilot sites were screened by criteria, namely severity of damage by flood, emergency and others with consultation by stakeholders. The proposal of pilot sites and activities as below are agreed;

   <Isiolo>
   Target area: Isiolo town and Central Division
   Activities: Community-based Warning System for Isiolo town
   Disaster Management Education in Primary School

   <Lumi>
   Target area: Rekeke Sub-Location and Kimala Location in Taveta Division
   Activities: Community-based Warning System
   Disaster Management Education in Primary School
   Training on livelihood improvement activities

3. Next Step for the Project and Training Programme

1) There is going to be change in an administrative structure of the government after the general election and the Project Team will have to adapt to the change to ensure output.
2) WRMA's engineering capacity related to flood management should be focused and enhanced after completion of the Project.
3) WDC Manual needs to be reviewed in order to allow for funding of flood management activities. Flood management module is going to be incorporated in the WDC Manual by JICA Experts Team and WRMA FMU.
4) There is need to accelerate the review of the SCMP to incorporate flood management.

Attachment: Attendance List

Attachment : Attendance List

Attendance List for the 3rd JCC

No	NAME	Designation/Institution	Station
1	Simintei Kooke	DD/SW	Ministry of Water and Irrigation
2	David K. Bosuben	Assistant Director	Ministry of Water and Irrigation
3	F.K. Nyambariga	Principal Land Reclamation Officer	Ministry of Water and Irrigation
4	Joseph M. Kinyua	TM	WRMA HQ
5	P.N. Njiru	ATCM	WRMA HQ
6	Joseph Kimanga Mutua	ATCM	WRMA HQ
7	Lawrence Thooko	ATCM SW	WRMA HQ
8	Elizabeth Diego	ATCM CO	WRMA HQ
9	Francis Edalia	DTCM	WRMA HQ
10	Rose Nyamori	WQO	WRMA HQ
11	Domitilah M Nziola	Senior Secretary	WRMA HQ
12	Margaret Abira	ATCM	WRMA Kisumu RO
13	Joseph Boit	CMO	WRMA Kisumu RO
14	Timothy M. Mutie	ATCM	WRMA Nanyuki RO
15	Canute Mwakamba	DTCM	WRMA Machakos RO
16	Sompe ole Kisira	CMO	WRMA Kisii SRO
17	Joseph G. Maina	CMO	WRMA Loitokitok SRO
18	E. O. Bukachi	Senior Assistant Director	Kenya Meteorological Department
19	Joseph Chirchir	DEO-MORDA	Ministry of Regional Development Authorities
20	Hideu Eguchi	Chief Representative	JICA Kenya
21	Meri Fukai	Project Formulation Advisor	JICA Kenya
22	John Ngugi	Senior Programme officer	JICA Kenya
23	Emmah Wairegi	Admin. Assistant	JICA Kenya
24	Katsuro Kondo	PCDEFM Chief Advisor	WRMA HQ
25	Hideki Sawa	PCDEFM Team Leader	WRMA HQ
26	Masaru Arakida	PCDEFM Expert	WRMA HQ
27	Masayuki Inoue	PCDEFM Expert	WRMA HQ
28	Yukihiro Mikumo	PCDEFM Expert	WEMA HQ

Attachment : Attendance List

No	NAME	Designation/Institution	Station
29	Rumi Kato	PCDEFM Expert	WRMA HQ
30	Alacoque Acheng	PCDEFM Admin. Assist.	WRMA HQ
31	Robert Owaga	PCDEFM Supervisor	WRMA Loitokitok
32	Jared Otieno	PCDEFM Supervisor	WRMA Isiolo
33	Clement Ngida	PCDEFM Supervisor	WRMA Kisii
34	Yuriko Doi	JICA HQ	Mid-term evaluation team
35	Riai Yamashita	mid-term evaluation concultant	Mid-term evaluation team

3rd Joint Coordinating Committee Meeting
on
the Project of Capacity Development for Effective Flood Management
in
Flood Prone Areas (PCDEFM)

Agenda

Date: Wednesday 13 February 2013
Time: 9:00 – 13:00 (TBC)
Venue: NHIF Auditorium, 2nd floor Wing B, NHIF Building, Nairobi

Objectives:
- To review and evaluate the general progress of the project
- To approve the annual work plan of the project
- To exchange opinions on issues regarding the project.
- To discuss any other issues pertinent to the smooth implementation of the Project

8:30-9:00	Registration (30 min)
9:00 - 9:10:	Opening Remarks from MWI (10 min)
9:10 - 9:15:	Opening Remarks from WRMA (5 min)
9:15 - 9:20	Opening Remarks from JICA (5 min)
9:20 - 9:40	Progress Report from JICA Project Team (20 min)
9:40 - 10:10	Result of the Mid-Term Evaluation of the Project from JICA Study Team (30 min)
10:10 - 11:00	Discussion (50 min)
11:00 - 11:20	Tea Break (20 min)
11:20 - 11:40	Next Steps including Training Programme from Project Team (20 min)
11:40 – 12:00	Recommendations from JICA Study Team (20 min)
12:00- 12:50:	Wrap Up Discussion (50 min)
12:50- 13:00:	Closing Remarks from WRMA (10 min)

7. Minutes of JCC

7-4 Minutes of 4th JCC

MINUTES OF MEETING

OF

THE 4th JOINT COORDINATING COMMITTEE (JCC) MEETING

ON

THE PROJECT ON CAPACITY DEVELOPMENT

FOR

EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS

IN

THE REPUBLIC OF KENYA

AGREED UPON BETWEEN

MINISTRY OF ENVIRONMENT, WATER AND NATURAL RESOURCES (MEWNR),

WATER RESOURCES MANAGEMENT AUTHORITY (WRMA)

AND

JICA EXPERT TEAM,

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Nairobi, 8 October 2013

Mr. James Teko Lopoyetum, HSC,
Principal Secretary,
Ministry of Environment, Water and Natural Resources.
State Department of Water.

Mr. Hideo Eguchi
Chief Representative
JICA Kenya Office

Eng. John P. Olum
Chief Executive Office
Water Resources Management Authority

Mr. Katsuro Kondo
Chief Advisor
JICA Project Team

Mr. Hideki Sawa
Team Leader
JICA Project Team

The 4th Joint Coordinating Committee (hereinafter referred to as "JCC") Meeting on the Project on Capacity Development for Effective Flood Management in Flood Prone Areas in the Republic of Kenya (hereinafter referred to as "the Project") was held on 8 October 2013. As the result of the discussions, JCC members confirmed the following issues;

1. Opening Remarks

Mr. John Nyaoro, Director Water Resources in Ministry of Environment, Water and Natural Resources, thanked participants for attending the JCC meeting. He pointed out that the fourth JCC meeting should give direction to where the Project is going. He added that floods were big problem in the country and Kenya as country lacked an authority that deals with disaster and leading institutions were already putting in place systems to manage floods. He pointed out that WRMA had already dispatched flood management officers at the Sub-regional offices. He pointed out that the trainings were ongoing and learning experiences from Japan was a plus in flood management.

Eng. Kinyua, Technical Coordination Manager in WRMA, in his opening remarks pointed out that the meeting aimed at looking at the 2 ½ years the Project has been ongoing vis-à-vis the WRMA's staff capacity and WRUA's capacity in management of floods. He pointed out that structural measures implementation was currently ongoing. He added that the JCC should request for extension of the Project period. He appreciated JICA for assistance to WRMA in mainstreaming flood management in the WRMA strategic plan. He pointed out that resources have been set aside for Flood Early Warning System (FEWS) and operational centres for dissemination of information at regional and sub-regional level.

Mr. Hanai, Senior Representative in JICA Kenya Office, in his opening remarks, pointed out that the Project was technical cooperation and three pilot sites had been selected which will include implementation of structural and non-structural measures. He added that JICA had signed MOU with KRCS on 19th Sept. 2013. He added that KRCS was leading agency in disaster management with over 70,000 volunteers was going to add value to the Project. He pointed out the serious earthquake in 2011 that led to Tsunami leading to losses of over 21,000 people. He gave analogy of a woman who survived the disaster with her baby, the woman pointed out that she had been taught by her grandmother on early warning and when she observed the early warning she left her valuables and with her child moved to raised place and she survived the disaster. The story indicates the importance of community involvement in disaster management. He added that he was eagerly waiting for lively discussion from the presentations.

2. Progress in Isiolo River Basin

Mr. Kinyanjui, Isiolo Sub-regional Manager of WRMA, in his presentation highlighted the progress of works in Isiolo river basin. He explained the characteristics of Isiolo River Basin. He also explained that rainfall characteristics in Isiolo and pointed out that Isiolo had two seasons of rains in April and November. He added that the Project covers Meru and Isiolo counties. He states that Integrated Flood Management Committee (IFMC) had been commissioned and explained the membership, objectives of the IFMC and he also stated that two meetings had already been held. He also explained the structural measures in Isiolo. He also stated the proposed countermeasures as captured in the plan and the selection method of the pilot structural measures that was being implemented under the Project. He also explained

the non-structural measures which include disaster management education, Community Based Flood Early Warning System (CBFEWS), training in sandbag, afforestation in the upper catchment, restriction on land use on the steep slopes.

He explained the Isiolo River Basin Integrated Flood Management Plan (IFMP) and what it addresses and the challenges therein. He added that the IFMP had a lifespan of five years and in the course of the five years the IFMC could review the plan accordingly based on the need.

He pointed out that based on selection criteria River Bank Protection emerged as the pilot structural measure. He added that public consultation meetings were held leading to consensus of the Project and community agreed to contribute 15% to the Project based on WRUA Development Cycle (WDC) module. He thereafter explained the procurement procedures of contractor that led to Waso Building and Road Co. was selected to carry out the works.

He concluded his presentation by pointing out the way forward was to finalize the IFMP, incorporate the IFMP into the SCMP.

Eng. Matagoro, Head of Flood Management Unit in WRMA, pointed out that based on the presentation it clearly indicated that project was community based with only technical assistance. He added that IFMP will be shared with the Isiolo County Government and find ways of implementing the plan.

3. Progress in Lumi River Basin

Mr. Maina, representing Nol Turesh Lumi Sub-Regional Manager of WRMA, in his presentation explained the progress of works upto October 2013: IFMC established, draft IFMP, Shared IFMP with Taita Taveta County Governor and procurement of the contractor for the works which is currently ongoing.

He explained the IFMC in Lumi and stakeholders who were members of the IFMC. He explained the characteristics of floods in Lumi River Basin. He explained the schedule of the IFMC. He thereafter explained the IFMP and the chapters therein. He thereafter explained the purpose of the pilot project structural measures, the proposed countermeasures in the IFMP, the selection criteria of the pilot project structural measures and the results of selection of countermeasure to be piloted. He added that the stakeholders through consensus selected the improvement of evacuation places and raising toilets. He also explained the processes of determine appropriate site wherein Eldoro Primary School was selected as the location for pilot project. He also explained that public consultation meeting was held and the purpose of the public consultation meeting. He also pointed out that the Project Team met with Taita Taveta County Governor and in the meeting Governor pointed out that the County Government was going to assist in rehabilitation of the dykes. He explained the procurement processes and that the process was still ongoing.

Eng. Matagoro pointed out that the Governor was keen with the schedule of implementation and repairing of damaged dykes. He pointed out that the Governor felt that when the dykes and canals are repaired then there will be no need for evacuation. He pointed out that the Governor had approached National Youth to carry out rehabilitation and requested for technical support from WRMA and the JICA Project Team.

4. Progress in Gucha Migori River Basin

Mr. Njihia, representing the Southern Shoreline Gucha Migori Sub-regional Manager, in his presentation, explained the background of Gucha Migori River Basin. He explained the process of establishing the IFMC in Gucha Migori river basin thereafter explained list of prospective Gucha Migori River Basin IFMC members, he also explained the way forward towards implementing of Gucha Migori River Basin first meeting. He also explained that IFMP was going to be incorporated in the Sub Catchment Management Plan (SCMP) and Catchment Management Strategy (CMS).

He thereafter explained the contents of Chapter one and two in a summary format which included policy, natural conditions, river structures and riverbed materials, hydrology and metrology, population and development plans. He also explained the possible activities that stakeholders can undertake, he also pointed out the current LOGUMI WRUA activities and also their activities in Flood Management.

5. WRMA Flood Management Training Course in Kenya and Japan

Eng. Kondo in his presentation stated that the Project aims at capacity building and therefore there are training components in the Project. He explained the first stage of training where WRMA staff will be trained, 2nd stage WRMA trained staff will train other WRMA staff and 3rd stage WRMA staff will train WRUA members. He explained that WRUA members would be trained based on WDC Flood Management Module. He explained that the 1st stage will commence on 14th October, he stated on 18th October the lecture will open up to other officer from other institutions, on 20th Oct. move to Kisumu and observe the experiences in the Nyando river basin.

He explained the training in Japan would consist of 12 staffs from WRMA, one staff from MEWNR and 3 members from the WRUAs. He added that in Japan the main activity was going to be site visits.

He explained the open lectures on 18 October 2013. He stated that Mr. OI will make key note presentation and he added that the open lecture was open to all JCC members. He explained rain gauge and water level gauge developed by Mr. OI who will explain and capacity build on how to develop the rainfall and river gauging devices. Thereafter Mr. OI will move to Isiolo and Taveta and install those gauges.

6. Project Design Matrix and Work Plan

Eng. Sawa in his presentation explained the modification of PDM and the Work Plan. He explained the Project Outputs and the verifiable indicators as per the Project Design matrix. He clarified that the PDM did not indicate the number of staff to be trained in the 1st stage and in the 2nd stage. He therefore proposed the following:

a) That 15 staffs in 1st stage, 2nd stage 25 persons and therefore the total is 40 persons which implies 12%. He therefore proposed that in PDM it should indicate 12% and 40 out of 319 technical staffs.
b) That 26 staffs were actively involved with the Project and therefore he proposed that it should be indicated that at least 25 staff had experience in community based flood management.

Revised Project Design Matrix (PDM) is shown in **Attachment 1**.

He thereafter explained the work plan wherein he explained that the Project could be divided into structural and non-structural components. He also stated that the Project perimeters which included training in Kenya and training in Japan, knowledge management and report. He thereafter explained the work plan in detail based on the above mentioned perimeters. Revised Work Plan is shown in **Attachment 2**.

5. Non-structural Measures in cooperation with KRCS in the target areas

Mr. Shadrack Musyoka of Kenya Red Cross Society (KRCS) in his presentation stated that the duration of the activities Sept. 2013 to February 2014. He explained the overall objective and he also explained the specific objectives. He explained that from the experience of Ethiopia Red Cross that use floods as an opportunity for irrigation. He explained the Project Implementation Structure. He explained the benefits of partnership with KRCS for JICA, WRMA and Community.

He thereafter explained the Progress of Activities. They pointed out the ongoing activities which included in site for installation of FEWS, develop plan with WRUA, identification of schools which will introduced of disaster management education and also designing of school drama, song and games. He pointed the upcoming activities conducting training volunteers and WRUA, establish KRCS clubs.

7. Wrap up

Eng. Matagaro thereafter ushered the participants into the Wrap sessions. He explained that the wrap session should be a lively session whereby the participants raise questions and discuss the various presentations.

Eng. Kondo kicked off the session by stating that he was impressed by the comments made by the Taveta County Governor on the Integrated Flood Management Plan. He added that it was very encouraging to hear that the Taveta County government was ready to utilize the Lumi River Basin IFMP. He added that WRMA should therefore cooperate with various County governments such that the county governments may acquire some of the skills that WRMA possessed.

Eng. Koki the deputy director of Water Resources in the Ministry of Water and Irrigation pointed out that he had noted that there was no scientific explanation on floods apart from Gucha Migori presentation which candidly discussed issues of hydrology. He further observed that from KRCS presentation that they intended to install rain gauges and he therefore inquired whether KRCS had an MOU with KMD for them to have authoritative data or otherwise the data collected from their rain gauges would be considered fake. Eng. Koki also stated that the presentation on Progress for Lumi River Basin erroneously reported that rain harvesting to reduce the impact of flood was not viable. He pointed out that rainfall played an important role in enhancing surface run-off which plays a part in floods. He pointed out that Gogo dam was earmarked for expansion under Nile initiates. Eng. Matagaro emphasized that hydrology was important and therefore the science of arriving at the conclusions for the countermeasures should be clearly outlined.

Mr. Musau responding to the issue of science in the IFMP wherein he explained that during the training on IFAS which he undertook alongside Eng. Kimanga and that they had collected data and that the monitoring data was inaccurate and that there was a need to upgrade stations

with real time data. Mr. Maina responded by pointing out that the water rain harvesting was effective but was given a no based on the selection criteria but not on its efficacy.

Eng. Kinyua clarified that time duration of implementation does not make a countermeasure ineffective but rather the countermeasure should be categorized under long-term implementation. He added that long-term implementation activities should trigger sourcing for funds for such activities to be implemented. He also pointed out that a way forward should be established since the activities in the long-term were high cost and though they could be funded by WSTF through the SCMP but that kind of arrangement was time consuming based on the levels of funds as per WSTF guidelines. He therefore stated that WRMA as an institution should find a way of resource mobilization to implement the proposed countermeasures in the IFMPs.

Eng. Kinyua further pointed out that the science element had already been discussed and dealt with and that the level where the Project was premised on was on coming up with countermeasures based on the science. He added that the current presentations were basically hydrology conceptualized in practical solutions.

Mr. Simeon Mwangi pointed out that Isiolo and Lumi river basins focus was structural measures and therefore the science had been worked out and that the focus was currently pegged on implementation which was not the case for Gucha Migori river basin where the focus was on non-structural and therefore the science element would always be at the forefront. He added that the Project had trained WRMA staffs on IFAS that was aimed at improving the Flood Early Warning System. Eng. Matagoro on his part pointed out that floods experience should be documented and replicated as the case may be.

Ms. Jeptoo of WRMA stated that KRCS should recognize that WRUA had developed their SCMPs and that KRCS should study the SCMP and identify the shortcomings of the SCMP in case there some and develop their plan based on what is lacking in the SCMP rather than duplicating the efforts of what had already been done. Eng. Matagoro pointed out that initial response and consideration of floods disaster was reactive and not proactive. He pointed out that the reason for KRCS involvement with the project was to develop proactive systems. Eng. Kimanga clarified that the development plan that KRCS had stated in their presentation aimed at the tasks based on the Project and was different from the SCMP. He further pointed out that the intention of the 4th JCC meeting was presentation on the progress and not the IFMP. He added that the Chapter 3 of the IFMP deals with the science behind the deductions for the countermeasures.

Mr. Nzyuko pointed out that the rain gauges were not being planted for any other purpose other than the flood early warning that the community can use as a community based flood early warning tool.

Mr. Shadrack of KRCS pointed out that KRCS was not working in isolation but with WRMA and JICA and that the installations of rain gauges was a collective responsibility between WRMA and WRUA. He added that the plan KRCS was developing was based on the activities they intended to carry out and the when such activities should be implemented.

Eng. Kondo asked the participants whether the revision of the PDM was agreed upon by members. The moderator thereafter asked the members to show by lifting up of hands whether the PDM review had been adopted. All participants thereafter lifted their hands implying a unanimously agreement that the PDM review was appropriate and therefore the reviews were adopted.

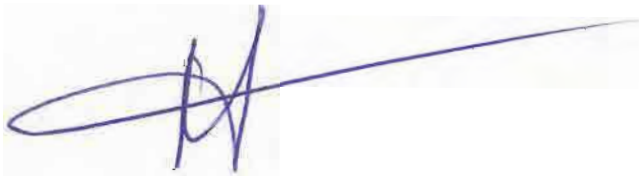
8. Closing remarks

Mr. Koki, Deputy Director of Water Resources Management in the MEWNR, pointed out that the science should come out clearly not in the annex. He added that 1KB05 was being upgraded that the reading could be captured and read online. He pointed out that KEWI should be involved in the Project that they should train others on the Project.

Eng. Kinyua in his closing remarks thanked participants for active and lively participations in all the sessions. He thanked the pilot project areas for coming up with the plans. He added that WRMA was concerned with the cost element of interventions that makes WSTF funding insufficient the countermeasures. He pointed out that after the plans had been adopted then WRMA should market the plans to other stakeholders that could come in and fund some of the interventions. He added that implementation in piecemeal was handicapping the flood management but holistic implementation would go a long way in ensuring effective flood management. He thereafter declared the meeting closed.

Attachment List

1. **Revised Project Design Matrix**
2. **Revised Work Plan**
3. **Attendance List**



Attachment 1

Project Design Matrix Version 2

Project Name: The Project on Capacity Development for Effective Flood Management in Flood Prone Area

Creation date: 8 October 2013

Duration: July 2011 – June2014 (3 years)

Target Group: Working Group in WRMA

	Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal	Institutional framework of flood management in the context of integrated water resource management is expanded to all of the six catchments.	· WRMA's Strategic Plan properly addresses flood management. · WRMA staff in charge of flood management has capacity to implement community based activities in the six catchments. · Flood management is incorporated in CMS and SCMP of flood prone areas in the six catchments · WRMA's knowledge management mechanism (knowledge management) and training system function covering the six catchments are established. · Budget for flood management is secured in the six catchments.	· Strategic Plan of WRMA · Training records and performance appraisal records · CMS and SCMP · WRMA's activity records and training records · ·Financial records	GOK maintains its strategy to promote flood management.
Project Purpose	In the Project target areas, institutional framework of flood management in the context of integrated water resource management is established for effective and sustainable implementation of community based activities.	· Staff of WRMA in charge of flood management in the project target areas has capacity to implement community based activities. · Flood management is incorporated in CMS and SCMP of flood prone areas in the project target areas. · WRMA's knowledge management mechanism (knowledge management) and triaging system function covering the project target areas are established. · Budget for flood management is secured in the project target areas.	· Training records, project records and performance appraisal records. · Strategies and plans in the project target areas. · WRMS's activity records and training records · Financial records	Budget and personnel for flood management is allocated as planned.
Outputs	1) At each level of WRMA (headquarters, regional offices and sub-regional offices), sustainable organizations in charge of flood management are strengthened.	1-1 A future plan of WRMA on flood management covering personnel, budget and function is prepared. 1-2 Catchment Management Strategies (CMSs) in the Project target areas properly integrate flood management. 1-3 Training plan, training material and trainers are prepared. 1-4 More than 12 % (40 numbers out of 319 technical staffs) of WRMA technical staffs attend training course by the end of this Project. 1-5 WRMA's institutional setup and budgetary systems for flood management are clearly defined and operated in the Project target areas.	1.1 Project records 1.2 CMS 1.3 Project records 1.4 Project records 1.5 Project records and financial records	· Trained staff continue working for WRMA · Residents in the pilot areas cooperate to the Project.
	2) For promoting community based activities of flood management, capacity of WRMA to support WRUAs and communities is strengthened.	2-1 Flood management plans in the pilot areas are prepared. 2-2 Materials describing the cases and lessons of the community based flood management activities are prepared. 2-3 More than 25 number of WRMA staffs have experience of community based flood management activities in the Project target areas.	2.1 Project records 2.2 Project records 2.3 Project records	

Activities	(1-1) Working Group (WG) analyzes the actual state of flood management at national, regional and sub-regional level respectively. (1-1-1) Institutional framework (1-1-2) Budget arrangement (1-1-3) Personnel allocation (1-1-4) Good practices (1-2) WRMA formulates a future plan of WRMA on flood management including personnel, budget and strategy. (1-3) WRMA elaborates Catchment Management Strategy (CMS) including flood management. (1-4) WRMA advises MWI to include a chapter of flood management in the National Water Resource Management Strategy (1-5) WRMA establishes a training system for WRMA staff. (1-5-1) Formulation of a training plan (1-5-2) Preparation of training manuals (1-5-3) Implementation of training courses for trainers (1-5-4) Implementation of training courses by the trainers (1-5-5) Evaluation and feedback of the outcomes from the training courses (1-5-6) Contribution to the relevant organization in terms of implementation of training courses (1-6) WRMA institutionalizes knowledge management mechanism at regional level and sub- regional level respectively (1-7) WRMA establishes institution and budgetary systems to address flood issues.	Inputs <u>Japan side</u> 1. Experts a) Chief Advisor / Flood management administration b) Flood management technology c) Community based disaster management d) Promotion of disaster management activity e) Institution / Training The other field will be considered when necessity arises 2. Equipment a) Office equipment (Personal computer and printer etc.) b) Project vehicles 3. C/P training in Japan 4. Facilities and equipment for community based activities a) sub-contracting cost for local consultant b) material and equipment cost for community based activities	<u>Kenya side</u> 1. Personnel allocation from Counter Part (C/P) a) Joint Coordinating Committee (JCC) b) Working Group (WG) 2. Budget allocation 3. Office Space and Facilities a) Office space b) Depot space for construction materials, vehicles and other necessary equipment 4. Local cost	Flood management Unit is established.

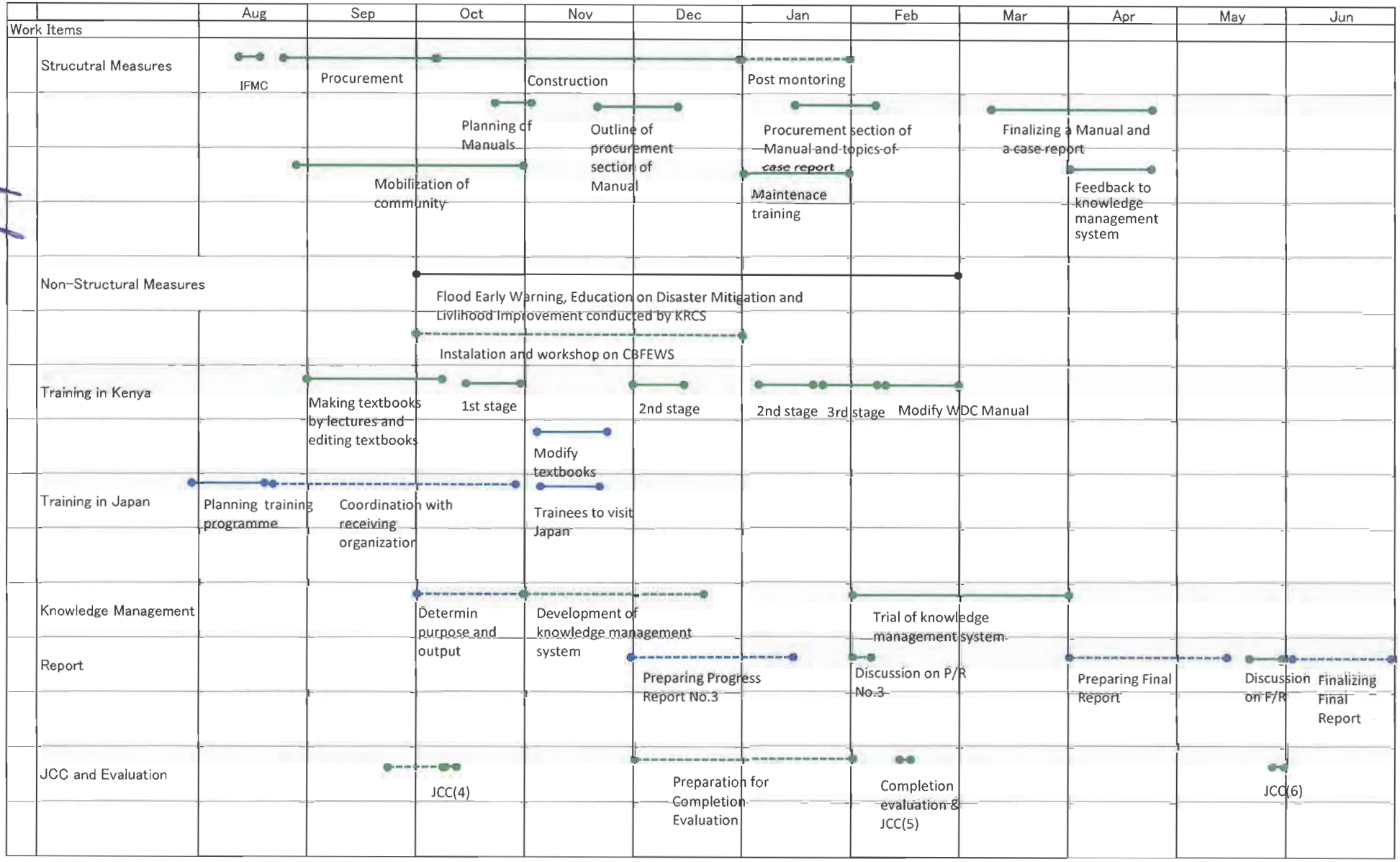
	(2-1) WRMA determines pilot sub-catchments. (2-2) WG establishes a coordinating function among relevant stakeholders such as flood management forum. (2-3) WRMA analyzes the current situations of communities.(Baseline survey) (2-3-1) Capacity assessment of community on flood management (2-3-2) Risk analysis including flood disaster map (2-4) JCC determines pilot areas based on a baseline survey. (2-5) WG facilitates communities to prepare flood management plans in the pilot areas to be integrated in Sub-Catchment Management Plan (SCMP) (2-5-1) Study on good practices (2-5-2) Participatory planning (2-6) WG supports the implementation of community based activities based on the flood management plans. (2-7) WG monitors and evaluates the community based activities. (2-8) WG prepares materials describing the cases and the lessons based on the community based activities. (2-9) WG contributes the cases and the lessons of the community based activities to the knowledge management mechanism.			

Attachment 2

Work Plan

Project Name: The Project on Capacity Development for Effective Flood Management in Flood Prone Area

8 October 2013



4th Meeting of Joint Coordinating Committee (JCC)
on
the Project of Capacity Development for Effective Flood Management
in
Flood Prone Areas (PCDEFM)

Agenda

Date: Tuesday 8 October 2013
Time: 9:00 – 13:00
Venue: Utalii College, Nairobi

Moderator: Eng. Wilfred Matagaro, DTCM (Flood Management), WRMA

8:30- 9:00	Registration (30 min)	
9:00 - 9:05	Opening Remarks from MEWNR (5 min)	Mr. Nyaoro, Dir. Of Water Resouces, MEWNR
9:05 - 9:10	Opening Remarks from WRMA (5 min)	Eng. Olum, CEO, WRMA
9:10 - 9:15	Opening Remarks from JICA (5 min)	Mr. Eguchi, Chief Representative, JICA Kenya Office
9:15 - 9:55	Progress in Isiolo River Basin (Presentation: 30 min; discussion: 10min)	Mr. Kinyunjui, MEN SRM, WRMA
9:55 - 10:35	Progress in Lumi River Basin (Presentation 30 min; discussion: 10 min)	Mr. Musau, NTL SRM, WRMA
10:35- 11:05	Progress in Gucha Migori River Basin (Presentation 20 min; discussion: 10min)	Mr. Maturwe, SSGM SRM, WRMA
11:05 – 11:20	Tea break (15 min)	
11:20 – 11:45	WRMA Flood Management Training Course in Kenya and in Japan (Presentation: 15 min; discussion: 10 min)	Eng. Kondo, JICA Project Team
11:45 – 12:00	Project Design Matrix and Work Plan (15 min)	Mr. Sawa, JICA Project Team
12:00 – 12:15	Non-structural measures in cooperation with KRCS in the target areas (15 min)	Kenya Red Cross Society
12:15 - 12:50	Wrap up Discussion (35 min)	
12:50 - 12:55	Closing Remarks from MEWNR (5 min)	Dir. Nyaoro, MEWNR
12:55 - 13:00	Closing Remarks from WRMA (5 min)	Eng. Olum, WRMA

7. Minutes of JCC

7-5 Minutes of 5th JCC

MINUTES OF MEETING

OF

THE 5th JOINT COORDINATING COMMITTEE (JCC) MEETING

ON

THE PROJECT ON CAPACITY DEVELOPMENT

FOR

EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREAS

IN

THE REPUBLIC OF KENYA

HELD ON THURSDAY, MARCH 20, 2014

AT

UTALII COLLEGE

AGREED UPON BETWEEN

MINISTRY OF ENVIRONMENT, WATER AND NATURAL RESOURCES (MEWNR),

WATER RESOURCES MANAGEMENT AUTHORITY (WRMA)

AND

JICA PROJECT TEAM,

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Nairobi, 21st March 2014

Mr. James Teko Lopoyetum, HSC,
Principal Secretary,
Ministry of Environment, Water and Natural Resources.
State Department of Water.

Mr. Hideo Eguchi
Chief Representative
JICA Kenya Office

Eng. John P. Olum
Chief Executive Office
Water Resources Management Authority

Mr. Katsuro Kondo
Chief Advisor
JICA Project Team

Mr. Hideki Sawa
Team Leader
JICA Project Team

The 5th Joint Coordinating Committee (hereinafter referred to as "JCC") Meeting on the Project on Capacity Development for Effective Flood Management in Flood Prone Areas in the Republic of Kenya (hereinafter referred to as "the Project") was held on 20 March 2014. Attendance list is shown in **Attachment 1**. As the result of the discussions, JCC members confirmed the following issues;

Min 1: Opening Remarks

Mr. Hanai of JICA Kenya made the opening remarks. In his remarks he pointed out that the JICA has supported flood management activities in Kenya since 2006 with the Master Plan Study for Integrated Flood Management in the Nyando, thereafter grant aid project in the Nyando and the current ongoing Project. He pointed out that it is not easy to control disaster but that it can manage. He added that climate change has led to increased disasters and that it is not easy to come up with big high investment structures to mitigate disaster. He added that the project aimed at building institutional and community capacity to manage floods. He added that today's meeting aimed at sharing the achievements of the Project and the result of terminal evaluation. He concluded his remarks by giving analogy of the tsunami disaster in Japan where over 30,000 people lost their lives. He explained that one mother with her child remembered a story shared to her by grandmother that in case of disaster the community members should go to the well and in case there are gargling in the well then the community members should escape to the back hill of the mountain. Therefore the lady with her daughter followed what the grandmother taught her and she escaped tsunami with her daughter. Mr. Hanai therefore pointed out the importance of traditional conventional way of mitigating disasters. He therefore stated that he hoped for a lively discussion and presentations during the workshop.

Mr. John Nyaoro, Director of Water Resources in Ministry of Environment, Water and Natural Resources thanked the participants for attending the workshop and JCC meeting. He gave apology on behalf of the PS of Water due to Ministry budgetary matters that were on going. He pointed out that the workshop aimed at building capacity. He drew from Mr. Hanai analogy and stated that knowledge was important in mitigating disasters. He pointed out that the project has played a key role in training staffs and also has led to discussions with government officials on what need to be put in place in order to mitigate floods. He thanked Japan Government in the efforts that JICA had undertaken in flood management not only in the current Pilot Project Areas but in the country. He requested the participants to lively in the workshop to achieve the best outcome desired for the workshop.

Eng. Kondo, the Chief Advisor to the Project, explained the outline of the JCC and the workshop. He also explained the structure of the Project. He outlined the history of flood management in Kenya which he stated started with Water Act 2002 and establishment of WRMA in 2005 that gave WRMA the mandate of managing floods in Kenya. He gave a synopisis of the JICA assisted projects in flood management in Kenya. He explained the Master Plan Project in Nyando with the 5 pilot project area. He thereafter explained the Japan Grant Aid Nyando project that was implemented in the Nyando River Basin. He further explained the post project conditions of the structural and non-structural measures in the Nyando where he stated that the evacuation centre were assisting community but in some villages the O&M was poorly carried out. He added that duplication of the Nyando Project was difficult due to the high cost of the Nyando Project. He thereafter explained the current Project including WRMA stage 1 and 2 training and the training of the community. He

thereafter explained the Project Structure consisting of Output 1 and Output 2. He explained the new constitutional dispensation has devolution and it was important to consider the element of devolution in flood management. He explained that output aimed at building capacity of the community in flood management. He thereafter explained the agenda for the workshop and JCC meeting.

CEO WRMA Eng. Olum pointed out that Flood Management was a mandate of WRMA; he stated that there were concerns during the bill whether there was enough capacity in flood management. He pointed out that the capacity had been built in flood management. He explained that the current political dispensation ushered county government. He added that counties were concern with flood management. He explained that he met with Governors representatives in Kisumu and all they discussed was flood management. He pointed out that for effective flood management there was need to incorporate county government in flood management and consideration of developing the capacity of the county government should be considered. He stated that the progress in developing the capacity of WRMA was good but there was much that needed to be done. The other areas that are affected by flood must be considered. He pointed out that it was important for WRMA staff to be trained in flood management giving an example of Elizabeth Diego who went to Japan. But he emphasized that it was prudent that grassroots community members be empowered in flood management and not control. He concluded his speech by requesting the development partners to assist WRMA and communities in flood management by assisting in the implementation of structural and non-structural measures that had been proposed by the Project assisted IFMPs.

Min 2: Report on activities on Output 1

Eng. Kimanga of WRMA HQ FMU began his presentation by explaining the Project Design Matrix (PDM). He explained the overall goal of the Project that the institutional framework of flood management in the context of integrated water resources management is expanded to the six catchments in the country.

Indicator 1-1: A future plan of WRMA on flood management covering personnel, budget and function is prepared.

He pointed out that WRMA has developed strategic plan 2012-2017 which is adopted and under implementation. Strategic Plan captured flood management as role of WRMA. He added that three flood management plan for three pilot project areas had been developed. He added that thirteen (13) plan of FM for thirteen (13) flood prone areas will be developed. He added that WRMA aims at establishing flood management department. He added that WRMA has dispatched FMO in all the ROs, SROs and FMU in the HQ. He added that in budgetary matter there are clear budget to support FM Activities.

Indicator 1-2: Catchment Management Strategies (CMSs) in the Project target areas properly integrate flood management.

WRMA is currently revising six CMSs which will address the integration of flood management

Indicator 1-3: Training plan, training material and trainers are prepared.

WRMA maintains annual training plan and under the PCDEFM WRMA stage 1 training was done in Kenya and Japan and they were trained to be trainers. Stage 2 training WRMA trainers are training FMO and 28 officers have been trained. 3rd Stage training aims at trained personnel in 2nd stage to train WRUAs in Flood Management. 3rd Stage not yet done

Indicator 1-4: More than 12 % (40 numbers out of 319 technical staffs) of WRMA technical staffs % of WRMA staffs attend training course by the end of this project.

So far 47 personnel trained which is more than 12% trained.

Indicator 1-5: WRMA's institutional setup and budgetary system for flood management are clearly defined and operated in the Project target areas.

FM department established, staff dispatched in all flood prone areas, FM has a budget, revision of WDC that has incorporated FM. Establishment of Assistance Manual for Community Disaster Risk Reduction Activities. This activity is on-going. That manual will be developed and used by WRUA. He explained that WRMA aimed at developing two kinds of manuals one for procurement manual and manual for supporting WRUA activities in FM. Manual on gabion works, raised road, sandbagging and O&M manuals.

He pointed out the need for Knowledge Management System which aimed at easing problem of searching and dealing with the problem of the huge gulf bridge between HQ and SROs.

The MC pointed out the reactions will be during the discussion session.

Min 3: Report on activities on Output 2 Isiolo Sub-catchment

Mr. Kinyanjui, WRMA Sub-Regional Manager Isiolo in his presentation highlighted the outline of Isiolo River Basin. He explained the type of flood that affects Isiolo, the natural conditions of Isiolo River Basin, the graphs of the daily rainfall in Isiolo, the topography of Isiolo. He stated that the Project assisted in coming up with causes and effects of floods in Isiolo River Basin. He explained the erosion and sedimentation as a result of floods. He explained in the process of implementation of the Project Flood Disaster Analysis had been carried out. He explained the countermeasures that were developed under the Integrated Flood Management Plan (IFMP) Isiolo River Basin. He explained that the communities have developed flood hazard maps and the Kenya Red Cross Society (KRCS) have trained community on flood management including Flood Early Warning System (FEWS). He stated that the community managed rainfall gauge gadget and river level gadget have been installed and community members are managing the same.

He explained that structural measures have been undertaken completed and handover to the community. He added that WRUA capacity for procurement was built. He added that WRUA were empowered in monitoring of the implementation of the gabion works.

He explained that no-structural measures had been undertaken with four rain gauge gadgets installed and one river level gadget.

He added that IFMP had been drafted and awaits adoption in April 2014 during 3rd IFMC Meeting.

Mr. Karimba, Chairman of Isiolo WRUA began his presentation by pointing out that the communities in Isiolo have greatly benefited from the Project. He pointed out that Isiolo is a water scarce area but when it rains the area becomes flooded. He explained that four rain gauges had been installed in Isiolo River Basin he added that the gadgets will play an important role in early warning because the floods in Isiolo town were not as a result of rains in Isiolo but in the slopes of Mt. Kenya. He added that river gauge that aims at FM had been installed in Isiolo.

He pointed out that community members are moving away from Riparian Land.

He added that river bank protection had been undertaken and WRUA members had been trained in the O&M. He pointed out that gabion works were expensive activity that will take time before WRUA could roll out such structure by themselves. He added that there was need for scaling up the Project and great beneficiary for the community will be development and construction of dams and check-dams that can be community use the flood water constructively.

Min 4: Report on activities on Output 2 Lower Lumi Sub-catchment

Mr. Musau WRMA Sub-Regional Manager Loitokitok began his presentation by explaining the outline of Lumi River Basin. He explained the natural conditions of Lumi River Basin. He explained the achievements in Lumi as Integrated Flood Management Committee (IFMC), draft IFMP, training of WRMA locally and internationally.

He explained that the County Government was actively involved in the IFMC. He added that IFMP (draft) had been developed and shared the plan with the Governor.

He explained the Flood Early Warning System (FEWS) where WRUA had been trained in assembling the gadget and installation. He explained the concept of early warning and pointed out that river gauge gadget had been installed and played an important role in warning community members to evacuate during floods two weeks after its installation.

He pointed out that WRMA staff and WRUA member went to Japan for further training in flood management

He further clarified the raised road construction using sand bags where WRMA staff and WRUA members were trained were ongoing.

He explained the current progress in construction of raised evacuation centre and toilets.

Mr. Fredy Reuna, secretary of Lower Lumi WRUA, explained the achievements in Lower Lumi. He pointed out that communities were the greatest beneficiary of the Project. He explained FEWS development of gadgets, DO-NOU (sand bag) technology in raised road construction, exchange visit to Nyando and LOGUMI SC, and the MOU signing where WRUA had a role to play in the construction of evacuation centre and toilet.

Min 5: Report on activities on Output 2 Lower Gucha Migori Sub-catchment

Mr. Masafu, WRMA Sub-regional Manager Southern Shoreline began his presentation explained the background of his presentation. He explained FEWS in Gucha Migori River Basin starting from the hydrograph, RGS gadget. He explained the first and second IFMC in Gucha Migori river basin. He explained the current progress of IFMP. He thereafter explained establishment of Community-based Flood Management Organizations (CFMOs). He also explained the impact of Nyando Project exchange visit.

Mr. Joshua Ouma, secretary of Lower Gucha Migori (LOGUMI) WRUA, explained the background of LOGUMI SC. He explained that floods in LOGUMI have been on increase both in intensity and impact. He explained the flood management trainings that the WRUA had undergone through. He explained the excursion visit to Nyando. He explained the training of WRUA member in Japan. He explained the use of hydrograph and the community based FEWS. He explained the cooperation with KRCS during the training. He further explained the LOGUMI WRUA achievements including rapid response against floods in 2013, he pointed out the good coordination and cooperation among the stakeholders. He explained the training of community members on monitoring and information. He explained that LOGUMI WRUA had established 11 CFMOs under WRUA. He explained the lesson

learnt was the raised toilets in the Nyando and using the knowledge from the visit and WRUA was able to convince World Vision to change design of the toilet and constructed raised toilets. He explained the milestone achievements of LOGUMI WRUA which included developing of Flood Hazard Map, participated in response of floods, participated in training in FEWS in Nairobi; He explained the challenges in LOGUMI WRUA and shared the pictures of the problems in LOGUMI SC and pointed out that LOGUMI WRUA had submitted a proposal to Japan Embassy for Grant for Grassroots for construction of evacuation centre in LOGUMI SC

Min 6: Report on KRCS activities

Mr. Shadrack Musyoka of Kenya Red Cross Society (KRCS) in his presentation explained the role of KRSC in the Project. He explained the sensitization trainings for WRUA. He also explained the Flood Early Warning System (FEWS) training and developing rain gauge gadgets. He explained that during FEWS training both traditional and scientific early warning were considered. He thereafter explained the installation of the rainfall gadgets.

He also explained the disaster management training that was carried out in the three pilot project areas. He explained the training materials that were used during the training. He explained that KRCS assisted schools through school clubs to discuss the issues of floods. He explained that songs and role plays were used in school. He explained the livelihood component of chicken rearing. He explained the methodologies that were used during the implementation of non-structural measures. He further explained that lessons learnt during the implementation. KRCS initially used to grants but the project gave them room to be part of tripartite partnership, community experience traditional and modern approaches on floods management and integrated approach in flood management between structural and non-structural measures in FM.

Min 7: Discussions on the report on output 2

MC invited Mr. Wanyonyi of WRMA to moderate. The moderator pointed out that as participants make the comments they should introduce themselves and organizations that they were representing. He gave brief overview of the presentations that had been undertaken during the morning sessions.

One participant wanted to know the plans in place to roll out the Project in all other parts of Kenya that are affected by floods and the role of devolution in FM. He also wanted to know the efficacy of structural and non-structural measures that had been implemented.

Mr. Ben Opaa of National Environmental Management Authority (NEMA) raised an issue with Mr. Kimanga presentation where flood prone areas were pointed out as the three pilot project areas. He wanted to know the other institutions that deal with flood in the country and how they interact with WRMA. MOU between Tanzania and Kenya what it entails and how the MOU will facilitate the management of trans-boundary waters.

Mr. Karimba of Isiolo WRUA pointed out that the airport and road construction are cause of floods in Isiolo and what can be done to mitigate.

Eng. Kimanga pointed out that FM department in WRMA was new and it was not possible for all flood prone areas in Kenya but they had to start by piloting in some of the areas. He pointed out that WRMA had done mapping and at least 15 SC are affected by floods. He stated that floods were not a preserve of WRMA but the Constitution 2010 gives disaster management to central government and county government. He added that WRMA aims at developing plans and activities that WRMA can undertake. He added that WRMA had been

mandated to coordinate flood management in Kenya. He further stated that measures can be divided only to structural measures.

Dir. Nyaoro stated that there was an MOU between Kenya and Tanzania which targets on getting was of implementing measures on the trans-boundary water. He pointed out that the two countries are identifying the activities that the two countries can undertake and after the activities had been developed then the activities will be handed to WRMA to implement under the support of WRMA.

Mr. Okge of Kenya National Highways Authority (KeNHA) pointed out that structural and non-structural measures were expensive and can be implemented in the piecemeal. He pointed out that construction of road is constructed after only after environmental and social impact assessment had been done. He added that the meetings are held for purposes of consultation but community members do not attended he gave example of construction of a road in Eldoret where community members did not attended the meeting. He pointed out that current set up of the construction of road demanded that the water that is being channeled must be certified where it will drain to. He further explained that under JICA assistance to National Road were being trained on road works, highway maintenance and environmental concerns.

MC pointed out that the water from the roads call for integrated approach in managing that kind of waters.

Min 8: Disaster Management Policy Post Hyogo Framework

Mr. Gordon Muga of Ministry of Interior and Coordination of National Government began his presentation by explaining the Hyogo Framework. He explained the five priorities of action i.e. ensure Disaster Risk Reduction (DRR) is a national and local priority, identify, assess and monitor disaster risk, use knowledge innovation, reduce the underlying risks factor.

He explained the Regional level member states of Africa had started formulating policies to address disaster. He explained the six objective of AU on disaster. He further explained the Sub-regional level where East Africa Disaster Risk Reduction and Management strategy while IGAD had developed a training manual.

At national level Kenya uses constitution and presidential decrees. He explained the objectives of National Disaster Risk Management Policy. He explained in summary the six chapters in the policy of National Disaster. He explained the comprehensive disaster risk management and thereafter the guiding principles and thereafter explained the code of conduct in disaster management.

He explained the National Disaster Management Authority (NADIMA), national funding mechanism and provision. He explained the devolved funds.

HFA 1 has not been fully implemented with emphasis on political commitment, commitment of more resources from development partners, commitment from global stage on public-private partnership to address urban risks and strengthen monitoring and evaluation mechanism for DRR projects and improve online reporting.

Min 9: Discussion on Devolution and flood management

MC invited Mr. Wanyonyi to moderate the session. Mr. Wanyanyi ushered the discussion and explaining in brief the presentation by Mr. Muga. He pointed out that top down approach was catastrophic where disaster occurs and then top government official flies to the area in a chopper to observe the disaster.

Mr. Ben Opaa of NEMA wanted to know the impact of disaster. He wanted to know how duplicity of effort is avoided between NADIMA and NADRA. He wanted to know the framework and interplay of NADIMA visivis the plan of government for lean government. He also wanted to know the funding stream can be enhanced to tackle the flood occurrence and drought.

One participant wanted to know the funding mechanism of disaster in Japan, the nature of flood management in Japan. He wanted to know how the draft framework is being used in intervening floods or the county governments are developing their own framework.

Prof. Onyando wanted to know the perimeters or guideline that determines a particular occurrence is a disaster and therefore funds are channeled to it.

Responses

Disaster policy started after El Niño rains and bomb blast. The policy formulated did not capture climate change and therefore the draft policy was sent back for review. During the review element of livelihood was incorporated. He added the policy has been realigned to the new constitution in consideration of the bill of rights. He explained that the policy is at cabinet levels and will soon be taken to parliament. He explained on the duplicity of efforts and stated that NDMA only focused on one disaster while NADIMA cuts across all the disasters. He pointed out NDMA is funded by EU. There are two options that NDMA be expanded to encompass other disasters or be augmented within the NADIMA.

He explained that National government sets the agenda and the County Governments develop their own county disaster reduction framework. County government need just to borrow from the National Government to developed their own.

Guidelines for declaring disaster is the inability of the nation to cope with a disaster. He pointed out due to political inclinations disasters exposes vulnerability of the nation and therefore

Min 10: Result of terminal evaluation of the Project

The afternoon session began with introductions of participants and the organizations that they represent. Mr. Kooke of Ministry of Environment, Water and Natural Resources chaired the sessions.

Ms. Nakamura of JICA Terminal Evaluation Team gave the results of the terminal evaluation. The outline in her presentation entailed introduction evaluation criteria. The outline of the Terminal Evaluation Study is shown in **Attachment 2**.

She explained the output and objectives of the Project. She explained the objectives of terminal evaluation.

She explained the five evaluation criteria i.e. relevance, efficiency, effectiveness, impact and sustainability.

She thereafter explained the summary of the results relevance (high), efficiency (Medium/low), effectiveness (low), impact (Medium/low), and sustainability (Medium/low).

She thereafter explained the evaluation criteria vis-a-vis evaluation and justification. She explained the current Project vis-a-vis Nyando project that implemented the Project through the community based organization i.e. CFMOs. She added that the current Project entry point was WRUA and she added that the idea was noble but for the success of such Project relies

on the proper organization of the WRUA where there are gaps in such situation it becomes difficult.

She explained the effectiveness was evaluated medium/ low because the Project has not achieved the Project purpose fully. She explained that there were hampering factors like the baseline survey that led to longer period in data collection poor project management wherein the scheduling was not checked, personnel allocation constant transfer of WRMA staff leading to slow capacity building process/ budget lack of finances to support activities of WRMA staff. If the budget is provided at the commencement of the Project then may be the activities could be done. The Project Team request for appointment of FMO but delayed until September 2013.

She explained the efficiency was evaluated low was vis-a-vis WRMA outputs, human resources, overseas training, equipment and cost.

She explained the impact was evaluated medium/ low in view of WRMA strategy, FMO and FMU i.e. the staff assigned not only assigned for flood management but also other role that makes it difficult to continue after the Project, revision of CMS which is ongoing and not sure if the revision of CMS will be carried out within Project duration period. On the training system 1st training, 2nd training and 3rd training. She pointed out that WRMA completed 2nd stage training, yet there is no plan for 3rd training. The budget not allocated to FM. Currently there is a budget for FM but in future it is not granted that the budget will be allocated.

She explained the sustainability was evaluated medium/ low vis-a-vis policy institution was good but organizationally there was a challenge based on the institutional framework that can sustain FM in the community. She pointed out technical transfer of Flood Hazard Map easy and is sustainable but on the structural measures. Pilot project sustainability not clear, IFMC sustainability is also in doubt.

She thereafter gave summary of evaluation and in summary she stated the Project need follow up support to check and guide the activity by the end of the Project

She invited Mr. Miyata, Leader of the JICA Terminal Evaluation Team, who gave the recommendations as follows

a) Mainstreaming flood management and incorporate in development plans;
b) Stronger institutional framework;
c) Extending Project activities to other regions. The Project Team to develop plan include scheduling and budgetary allocations before the end of the Project;
d) Resources/ budget. WRMA to conduct coordination for WRUA to ensure they get funding;
e) Capacity development. WRMA and Project Team to review 2nd stage training and come up with lesson learnt and capacity assessment. WRMA should conduct 3rd stage training;
f) Community participation/ coordination with flood vulnerable residents;
g) Community-based Flood Early Warning System (water gauge and rain gauge); WRMA to develop working group for FEWS and WRMA to provide technical advices to WRUA;
h) Knowledge management: Make manual for early warning, disaster education and livelihood;
i) Integrated Flood Management Committee
j) Structures constructed in pilot project. Recommend WRMA and Project Team to coordinate WRUA on ownership of the structures

He pointed out if the recommendations are implemented then the evaluation will be high.

Min 11: Discussion on the result of the terminal evaluation of the Project

Mr. Wanyonyi moderated.

Ms. Diego, Assistant Technical Coordination Manager in charge of community development of WRMA, wanted to know the perception of terminal evaluation on the community and the WRUA. She pointed out that what an X put on finance implies.

Response

Ms. Nakamura pointed out that according to WRMA WRUA is the community but JICA focus is the affected community. WRUA was formulated to solve water resources problem while community that focuses on floods. Mr. Wanyonyi pointed out that not only WRUA members are community members but all WRUA members in a particular geographical area are community members. Ms. Nakamura pointed out that focus on sustainability where finance was marked X was because the finance is based on concrete plan on the budget that can be used could not be noted with WRMA especially after the Project. Mr. Wanyonyi pointed out that if the future on budgetary was doubtful he would have preferred a question mark (?) rather than X

Mr. Njiru pointed out CFMO in Nyando have a problem of sustainability and WRMA uses WRUA because they have an MOU that enhances management. He added that FMU in headquarters in the only place where members have other assignment but in ROs and SROs there are flood management officers.

Prof. Onyando pointed out WRUA provides framework to CFMO to join them, WRUA members cannot turn away CFMO because they are members from that geographical area. He pointed out that FM was in the WRUA. He added that WRMA a national institution while flood is localized and for effective utilization of human resource must be considered.

CEO pointed out that WRUA by definition it may seem distinct but in flood impact the WRUA represented the community. WRUA were able to draw flood hazard map therefore the capacity to manage floods was available. He pointed out that WRUA was open to everyone and WRUA was not exclusive to individual. He added that it was a misconception that WRUA was a sub-set of the community but it was a community.

Min 12: Future development of flood management after the Project

Eng. Kimanga in his presentation stated that floods must be looked at from the disaster point of view. He explained floods caused loss of lives and loss of livelihood. He pointed out that disasters in Kenya was important and was considered at two tires of governments i.e. national and county governments.

He explained flood management in WRMA was a core mandate and currently the Project covered three SC. He explained that 15 other SC were also affected. He thereafter explained the proposed Framework of WRMA Action Plan in FM.

He stated that WRMA considers floods pre, during and post floods. He added that WRMA were preparing programmes for prefloods, during floods and post floods. In pre-flood phase FM plans and budget, early warning, inert-county and agencies coordination, putting up structural and non-structural measures shall be made. During floods monitor of high flows

and sedimentation and information dissemination shall be conducted. On post flooding review of flood plan, update flood hazard map shall be done.

He pointed out that other stakeholders' key in flood management includes KRCS and KMD.

He pointed out the actions WRMA intended to implement development of integrated flood management policy; mapping of flood prone areas in the country; delineation potential river basins for development of IRBFMPs; assess capacity of flood monitoring networks; collection of socio-economic data in the flood prone areas; flood data analysis; coordinate flood management stakeholders forums; development of integrated Flood Management Plan for other SC; Review of CMS and other planning tools such as SCMPs to incorporate IFM; review the annual budget for Flood Management; develop project proposals for flood management in flood prone areas from adopted IRBFFMPs; dissemination of flood information to public; train community to develop disaster prevention and hazard maps; develop TOR for code of practice to support self-help/ mutual help projects; development of a framework for river classification.

He pointed out that the current Project was a good opportunity and eye opener for WRMA/WRUA in possible flood management activities. He added that this kind of technical cooperation can be enhanced and strengthened continuously. The outline of the presentation is shown in **Attachment 3**.

Min 13: Discussion on future development of flood management after the Project

KMD representative pointed out that KMD was ready to cooperate with WRMA on early warning. He added that most Met stations across the country are able to give warnings every ten minutes. He added that a model can be developed that can allow an accurate two day weather focus. He added KMD with support can develop such models for every catchment similar to the one that is being operated in Budalangi.

Min 14: closing remarks

Mr. Kooke deputy director Water Resources Management handed back to the MC who pointed out that most of the presentation had been done.

Eng. Kondo passed a vote of thanks to all participants and volunteered to demonstrate the community based early warning. He thereafter requested Ms. Diego to pray before the closure of the meeting. He thereafter declared the meeting closed.

Adjournment

The meeting thereafter was adjourned.

Attachment List

1. **Attendance List**
2. **Outline of the Terminal Evaluation**
3. **Outline of the Future Development of Flood Management after the Project**

Attachment 2

Terminal Evaluation Study

Project on Capacity Development for Effective Flood Management in Flood Prone Areas In Republic of Kenya

March 20, 2014
Terminal Evaluation Team
Mitsuko NAKAMURA (Evaluation Analysis)

1

Outline of Presentation

- Introduction
- Evaluation by The Five Criteria
  - Relevance
  - Effective
  - Efficiency
  - Impact
  - Sustainability
- Recommendations

2

Output and Objectives of the Project

Project Objective:
Institutional Fromework of flood and integrated water resource monagement is established in Target Areas

Community-Based Activities In Target Areas

Structure Measures

Non-Structure Measures

Output 1:
Strengthening the capacity of WRMA as a sustainable organization for flood management

Output 2:
Strengthening the Capacity of WRMA to support and WRUA and communities

Objectives of Terminal Evaluation

(1) To review and evaluate the inputs, activities and achievements of the Project, and to summarize the achievement.

(2) To execute a comprehensive evaluation on the achievement of the Project from the viewpoint of the five criteria of evaluation, namely "Relevance", "Effectiveness", "Efficiency", "Impact" and "Sustainability".

(3) To make recommendations on future perspective of the Project and draw lessons learned from the Project for the projects in the same field of technical cooperation.

EVALUATION BY THE FIVE CRITERIA

Item	Content
Relevance	An overall assessment of whether the project purpose and overall goal are in line with recipient and donor policy and with recipient needs
Efficiency	Measurement of whether the project purpose has been achieved
Effectiveness	Compare "planned" and "actual" figures using indicators to examine to what extent objectives of the project have been attained
Impact	Examine direct/ indirect & positive/ negative effects of the project from macro-economic, social and environmental perspectives.
Sustainability	Examine medium and long-term sustainability of the project effects, and examine possible countermeasures are required to resolve the problems if any.

Summary Results of Evaluation

Relevance	High
Effectiveness	Medium/Low
Efficiency	Low
Impact	Medium/Low
Sustainability	Medium/Low

EVALUATION BY FIVE CRITERIA

Criteria	Evaluation	Justification
Relevance	High	•Policy Support from GOK(◎) •Japanese ODA Policy(◎) •Selection of Target Areas(△)
Effectiveness	Medium /Low	•Achievement of Project purpose (Middle) •Hampering Factors (Baseline Survey/Poor Project Management/ Personnel Allocation/Budget) •Contributing Factors (FMO)

EVALUATION BY FIVE CRITERIA

Criteria	Evaluation	Justification
Efficiency	Low	•Outputs (Medium) •Human resources •Overseas Training •Equipment •Cost
Impact	Medium /Low	•WRMA Strategy(◎) •FMO (◎)FMU(△) •Revised CRS(○) •Training System(○) •Budget(△)

EVALUATION BY FIVE CRITERIA

Criteria	Evaluation	Justification
Sustainability	Medium /Low	•Policy & Institutional(◎) •Organizationally(○) •Financially(×) •Technically(○) •Pilot Project(△)

Summary of Evaluation

- The team has confirmed that the expected outputs have been partially achieved due to the notable delay in the implementation of the Project.
- It was also assumed that the Project would not achieve its purpose fully within the cooperation period.
- Therefore the Team concluded that the Project will need follow-up support to check and guide the activity by the end of the Project and after the Project if necessary.

Recommendations

(1) Mainstream flood management and incorporate in development plans.
(2) Stronger institutional framework
(3) Extending Project activities to other Regions
(4) Resources / Budget
(5) Capacity Development

Recommendations (Continued)

(6) Community participation
(7) Community-based Flood Early Warning System (water gauge and rain gauge)
(8)Knowledge Management
(9)Integrated Flood Management Committee
(10)Structures constructed in pilot project

Attachment 3

FUTURE DEVELOPMENT OF FLOOD MANAGEMENT

Presentation by:
Eng. Joseph K Mutua
20 March 2014

FLOOD MANAGEMENT IN PERSEPECTIVE

- Floods can be a disaster.
- Disaster is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

(UNISDR)

Why Disaster Management?

- Losses in:
  - Human life
  - Property and Material
  - Economic
- GoK has mandated both National and County Governments with Disaster Management. It is a concurrent function and involves many stakeholders.
- Next Millennium Development Goals???

The CoK 2010

Extract from the 4th Schedule - Distribution of functions between the National Government and County Governments

Part 1 – National Government
(2, 18, 19, 22, 24, 32, 33)
2. The use of international waters and water resources
18. Transport and communications, including, in particular - (e) pipelines
19. National public works
22. Protection of the environment and natural resources with a view to establishing a durable and sustainable system of development, including, in particular (c) water protection, securing sufficient residual water, hydraulic engineering and the safety of dams
24. Disaster management
32. Capacity building and technical assistance to the counties
33. Public investment

Part 2 – County Governments
10. Implementation of specific national government policies on natural resources and environmental conservation, including (a) soil and water conservation, (b) forestry
11. County public works and services, including (a) stormwater management systems in built-up areas; and (b) water and sanitation services
12. Fire fighting services and

Flood Management in WRMA

1	Athi	Nairobi
2		Loitokitok
3		Mombasa
4	Tana	Garissa
5	Ewaso Ngiro North	Isiolo
6		Runuruti
7		Mandera
8	Rift Valley	Lodwar
9		Narok
10		Kabarnet
11	Lake Victoria North	Siaya
12		Kitale
13	Lake Victoria South	Kisii
14		Kisumu
15		Kericho

Proposed Framework of WRMA Action Plan in Flood Management

Stakeholders	Roles before floods	Roles During floods	Roles After floods
Ministry of Environment Water and Natural Resources	Develop Flood policy	Inter-government/ministerial Coordination	Review and update the policy
County Government	Domesticate the flood policy	Mobilise resources	Support Rebuilding

Framework cont'd

Stakeholders	Roles before floods	Roles During floods	Roles After floods
WRMA	• Flood Management Plans and budget • Early warning • Inter county and agencies coordination • Put in place structural and non-structural measures • Community mobilization	• High flow, rainfall and sediment monitoring • Information dissemination	• Review the flood mgt plans • Update the flood hazard maps • Update the early warning systems • Mitigate on the flood structural and non-structural measures • Update the database

Framework cont'd

Stakeholders	Roles before floods	Roles During floods	Roles After floods
Kenya Meteorological Department	• Early warning	• Rainfall monitoring • Information dissemination	•Update weather database. •Disseminate information.
Regional Development Authority	Identify and share information on flood prone areas	Implement Integrated Flood management plans	Support Rebuilding
Kenya Red Cross Society	• Stock Resources for Flood disaster • Perform evacuation drills	• Evacuation of the vulnerable • Removal victims • Distribution of relief items • Disseminate information	Update the database

Action items by WRMA after end of this project

- Continue to work on the development of integrated flood management policy
- Mapping of flood prone areas in the country.
- Delineate potential river basins for development of IRBFMPs
- Assess flood monitoring network for collecting and disseminating of information
- Collection of socio-economic data in the flood prone areas.
- Flood data analysis (cause – effect) to support plans preparation

Actions Cont.

- Coordinate flood management stakeholders forums
- Development of integrated flood management plans for other sub catchments
- Review of Catchment Management Strategies and other planning tools such as SCMPS to incorporate IFM
- Review the annual budget for flood management
- Develop project proposals for flood management in flood prone areas from adopted IRBFMPs
- Dissemination of flood information to public

Actions Cont'

- Train community to develop 'my disaster prevention and hazard maps'.
- Develop TOR for code of practice to support self help/mutual projects
- Development of a framework for river classification

7. Minutes of JCC

7-6 Minutes of 6th JCC

MINUTES OF MEETING

OF

THE 6th JOINT COORDINATING COMMITTEE (JCC) MEETING

ON

THE PROJECT ON CAPACITY DEVELOPMENT

FOR

EFFECTIVE FLOOD MANAGEMENT IN FLOOD PRONE AREA

IN

THE REPUBLIC OF KENYA

HELD ON THURSDAY, JULY 31, 2014

AT

UTALII HOTEL

AGREED UPON BETWEEN

MINISTRY OF ENVIRONMENT, WATER AND NATURAL RESOURCES (MEWNR),

WATER RESOURCES MANAGEMENT AUTHORITY (WRMA)

AND

JICA PROJECT TEAM,

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Nairobi, 1st August 2014

Mr. James Teko Lopoyetum, HSC,
Principal Secretary,
Ministry of Environment, Water and Natural Resources
State Department of Water

for Mr. Hideo Eguchi
Chief Representative
JICA Kenya Office

Eng. John P. Olum
Chief Executive Office
Water Resources Management Authority

Mr. Hideki Sawa
Team Leader
JICA Project Team

The 6th Joint Coordinating Committee (hereinafter referred to as "JCC") Meeting on the Project on Capacity Development for Effective Flood Management in Flood Prone Area in the Republic of Kenya (hereinafter referred to as "the Project") was held on 31st July 2014. Attendance list is shown in **Attachment 1**. As the result of the discussions, JCC members confirmed the following issues;

Min 1: Background, Objectives and Outline of the Project

The draft final report of the Project was prepared by the JICA Project Team and presented to Ministry of Environment, Water and Natural Resources (hereinafter referred to as "MEWNR") and Water Resources Management Authority (hereinafter referred to as "WRMA"). Mr. Hideki Sawa, Team Leader of JICA Project Team, presented to the participants the background, objectives and outline of the Project. The Project Design Matrix (PDM) is shown in **Attachment 2**.

Activities after the 5th JCC and the terminal evaluation were presented as follows;

1) Pilot structural measures such as a riverbank protection in Isiolo and an evacuation centre in Lumi were completed. MOU on ownership, property rights and operation and maintenance responsibility for the works to be agreed upon among WRMA, WRUA and the JPT was prepared. Handing over of those structures from the JPT to WRMA was completed on 17 April 2014.
2) Training and Capacity Development
   - The 2nd stage training was evaluated and reviewed
   - The 3rd stage training for Lower Gucha Migori WRUA was conducted in May 2014
   - Capacity assessment of WRMA was conducted by the WG in June 2014
3) Establishment of Community Based Flood Early Warning System (CBFEWS)
   - Manual was developed.
   - Simple rain gauges and water level gauges were installed.
   - WRMA formulated the expansion plan to nationwide coverage.
   - CBFEWS forum in Lumi River Basin, Taveta was held.
4) Development of Manuals
   - Eight (8) manuals and two (2) lessons learnt report were developed and handed over to WRMA
5) Expansion of IFM to nationwide coverage
   - IFM nationwide expansion plan with budget plan was prepared.
   - The plan includes such works as flood hazard mapping, Integrated Flood Management Committee (IFMC) formulation and operation, Integrated Flood Management Plan (IFMP) development, CBFEWS installation, WRMA FM training and WRUA FM training.
6) Community Participation
   - Flood Management Sub Committee (FMSC) is recommended to be set up under WRUA in flood prone area.
   - Community-driven Flood Management Organization (CFMO) under WRUA can be a direction to take for better community participation for flood management.
7) Knowledge Management
   - The form and procedure for Flood Survey were prepared and they will be used in the second rainy season of 2014.

8) Revision of CMS: FM was incorporated in the revised CMSs.

9) Integrated Flood Management Plan (IFMP)

   - Three (3) IFMPs in three pilot river basins namely Isiolo, Lumi and Gucha Migori were developed in the target three river basins.
   - Twelve (12) target river basins were selected and IFMPs for these river basins are scheduled to be developed within next three years.

10) Enhancement of FM in WRMA: ATCM (FM) in HQ was appointed exclusively to FM.

11) Reflection of flood management issue to other national acts and plans

   - Disaster Management Bill is yet to be approved.
   - Water Bill is yet to be approved.

12) WDC Manual revision

   - FM module (Chapter 9) was incorporated into WDC Manual Version two (2) finalized in April 2014

13) Integrated Flood Management Committee (IFMC)

   - IFMCs in three pilot river basins were established and operationalized.
   - IFM nationwide expansion plan with budget plan including IFMC establishment and operation in twelve (12) target river basins was prepared.

Expected actions to be taken by WRMA after the Project were exlained as follows;

1) Utilization and updating of manuals
2) CBFEWS expansion and operation and maintenance of installed system
3) Execution and continuous improvement of WRMA IFM training
4) Execution and continuous improvement of WRUA IFM training
5) Incorporation of IFM into SCMPs
6) Handover of the structures of the pilot projects from WRMA to WRUA
7) Knowledge management

   - Implementation of flood survey after every rainy season
   - Utilization of WRMA website for storing and sharing of knowledge on community based FM

Min 2: Activities and Achievement of Output 1

Mr. Simon Mwangi, Assistant Technical Coordination Manager (ATCM) in charge of Flood Management of WRMA presented the Output 1 and the indicators as follows;

Description
Output 1: At each level of WRMA (headquarters, regional offices and sub-regional offices), sustainable organizations in charge of Flood Management are strengthened.
Indicators: 1.1 A future plan of WRMA on Flood Management covering personnel, budget and function is

prepared.

1.2 Catchment Management Strategies (CMSs) in the Project target areas properly Integrate Flood Management.

1.3 Training plan, training material and trainers are prepared.

1.4 More than 12 % (40 from 319 technical staffs) of WRMA staffs attend training course by the end of this project.

1.5 WRMA's institutional setup and budgetary system for Flood Management are clearly defined and operated in the Project target areas.

Indicator 1.1

In 2012, WRMA developed "WRMA Strategic Plan 2012-2017" as a five-year plan. In the plan flood management is clearly mentioned as a mandate and function of WRMA.

That plan also cater for personnel reinforcement that led to the establishment of Flood Management Department (FMD) at HQ, ROs and SROs and appointment of Flood Management Officer (FMO) and all these were approved in January 2013. In July 2013 FMD was established and FMOs were deployed to their respective catchments.

As for the future budget plan, Annual Corporate Work Plan for FY 2014/15 shown in **Attachment 3** has included flood management activities.

Indicator 1.2

Revision of CMSs has since been carried out by WRMA and the revised CMSs capture integrated flood management. Revised CMSs in the Project target areas have been already developed and are being presented to the counties and relevant stakeholders.

Indicator 1.3

Training plan with time table, materials including WDC Manual Flood Management Module and teaching materials were finalized.

Master trainers were fostered in the 1st stage training (TOT). Trainers for WRUA were fostered in the 2nd stage training. The trained trainers conducted 3rd

Budget for expansion of 2nd stage training for other WRMA officers and 3rd stage training for WRUA was included in the Annual Corporate Work Plan for FY 2014/15.

Indicator 1.4

1st stage training: 17 officers x 10 days (Oct. 2013)

2nd stage 1st batch: 16 officers x 5 days (Dec. 2013)

2nd stage 2nd batch: 15 officers x 5 days (Feb. 2014)

In total, 15 % (48 from 319 technical staffs) of WRMA staffs participated in the training.

Indicator 1.5

Flood Management Department (FMD) was established in HQ, six (6) ROs and fifteen (15) SROs in flood prone areas. One (1) DTCM and one (1) ATCM in charge of flood management were allocated at the HQ, six (6) ATCMs in charge of flood management were allocated at six (6) ROs, and

fifteen (15) FMOs were deployed at fifteen (15) SROs. Three layers (HQ, RO and SRO) of personnel system was set up. In total, twenty three (23) staff members were appointed in charge of flood management. The roles and mandates of FMD were clarified in the Annual Corporate Work Plan for FY 2014/15.

In the FY 2013/14, budget of flood management was incorporated. The budget of flood management for FY 2014/15 was defined.

Min 3: Activities and Achievement of Output 2

Mrs. Elizabeth Diego-Lusimba, ATCM in charge of Community Development of WRMA presented the Output 2 and the indicators as follows;

Description
Output 2: For promoting Community-based activities of Flood Management, capacity of WRMA to support communities is strengthened.
Indicators: Indicator 2.1 Flood Management plans in the pilot areas prepared. Indicator 2.2 Materials describing the case and lessons of Community-based Flood Management activities are prepared. Indicator 2.3 More than 25 number of WRMA staffs have experience of Community-based Flood Management activities in the Project target areas.

Indicator 2.1

Integrated Flood Management Plans (IFMPs) for Isiolo River Basin and Lumi River Basin were prepared. In Gucha Migori River Basin, through the 4th IFMC meeting on 17th July, draft IFMP was adopted and is being finalized by WRMA.

Indicator 2.2

The following three types of documents were prepared by the Project Team in cooperation with Working Group (WG);

1) Manual on supporting community-based flood management activities for WRMA and WRUA

(1) Manual on Supporting WRUA Procurement

2) Manuals on community-based flood management activities for WRMA and WRUA

a) Structural Measures

(2) Manual on DO-NOU raised road

(3) Manual on evacuation centre including raised toilets and drainage culverts

(4) Manual on river bank protection using gabion

b) Non-structural Measures

(5) Manual on Community Based Flood Early Warning System (CBFEWS)

(6) Manual on flood disaster education

(7) Manual on evacuation drill

(8) Manual on community-based flood hazard map

3) Case Study and Lessons Learnt Report

(9) Lessons learnt from Pilot Activities

(10) Lessons learnt from Nyando River Basin

Indicator 2.3

Forty (40) C/Ps in total at HQ, RO and SRO levels participated in the community activities (structure and non-structure).

Some of them have since developed their capacities and they have become lecturers of the disaster management education program in the community and the schools. In addition, there are many staffs who have learned techniques for producing an early warning system. CBFEWS will actually be installed later in the outside of the pilot areas. There are also many staffs who acquired knowledge on the Integrated Flood Management Plan of a river catchment and coordination of stakeholders through the Integrated Flood Management Committee (IFMC).

There were also good opportunities for WRMA staffs to participate in community based activities (non-structure measurement) such as school and community education program and evacuation drill conducted by KRCS. However, some of these opportunities were missed due to communication breakdown between KRCS and WRMA, and therefore WRMA staffs could not be fully involved in those activities.

Min 4: Achievement of Project Purpose and Developed Capacity of WRMA on Flood Management

Mr. Alexander Nzyuko, Deputy Technical Coordination Manager of WRMA presented developed capacity of WRMA on flood management and achievement of the Project Purpose as follows;

Developed Capacity of WRMA on Flood Management

In July 2012, necessary capacity for WRMA in the field of flood management was discussed through the meeting with the Working Group and the JICA Project Team. Based on the discussion, prioritized subjects which should be tackled by GOK were listed as follows;

1) To integrate data and analyze causes and effect relationship of flood

2) To formulate river basin flood management plan

3) To develop resilient community to floods

Also, necessary capacity to conduct above mentioned subjects were decided as follows:

- To develop a system to collect information/data related to cause and effect of flood holistically
- To analyze information/data related to cause and effect of flood holistically
- To coordinate relevant stakeholders for better flood management
- To advice WRUAs to formulate SCMPs
- To formulate and update a manual on flood cause and effect assessment and teach RO/SRO and County (District) officers
- To formulate "River Basin Flood Management Plans" which shall be under the CMSs and oversee the SCMPs

The abovementioned capacities were assessed within the Working Group (WG) that was held in November 2011, one and half year after the Project had commenced. And another assessment was carried out before the end of the Project, in the WG meeting that was held in June 2014.

Capacities which were assessed and were deemed as very much improved were: "4 To advice WRUAs to formulate SCMPs" with 75%; "6 To formulate "River Basin Flood Management Plans" which shall be under the CMSs and oversee the SCMPs" with 57%; and "5 To formulate and update a manual on flood cause and effect assessment and teach RO/SRO and District officers" with 27%.

Project Purpose and Indicators:

Description
Project Purpose: In the Project target areas, institutional framework of flood management in the context of integrated water resource management is established for effective and sustainable implementation of community based activities.
Indicators: 1: Staff of WRMA in charge of flood management in the project target areas has capacity to implement community based activities. 2: Flood management is incorporated in CMS and SCMP of flood prone areas in the project target areas. 3: WRMA's knowledge management mechanism (knowledge management) and triaging system function covering the project target areas are established. 4: Budget for flood management is secured in the project target areas.

Indicator 1:

Many C/Ps received transfer of knowledge and enhanced their capacities through the Project activities under the close collaboration and working with the Project supervisors and JICA Project Team as described in Indicator 2.3 of Output 2. In addition, almost all the C/P staffs participated in the 1st and 2nd stage training, and learned theories and concepts of flood management through the training as confirmed in Indicator 1.4 of Output 1.

Based on the abovementioned capacity assessment after the Project, (4) to advice WRUAs to formulate SCMPs, (6) to formulate "River Basin Flood Management Plans" which shall be under the CMSs and oversee the SCMPs, (5) to formulate and update a manual on flood cause and effect assessment and teach RO/SRO and County (District) officers, and (3) to coordinate relevant stakeholders for better flood management were relatively highly evaluated as very much improved and/or partially improved.

In total, 23 % of elements of capacity development were deemed as very much improved and 55 % were deemed as partially improved.

Indicator 2:

As for CMS, revision process of CMS has been carried out, and revised CMSs are currently in the final draft stage and IFM is already included. This is because the context of WDC Manual sets the standard for CMS and in WDC Manual has chapter 9 that entails flood management contents.

As for SCMP, IFMPs for Isiolo River and Lumi River have been completed and ready to be incorporated into SCMP. Meanwhile the IFMP for Gucha Migori River is in the process of finalization. WRMA FMD has included budget for the revision of SCMPs in the three pilot river basins in the Annual Corporate Work Plan.

WDC Manual was updated and flood management was incorporated in chapter 9. Therefore, the newly developed SCMPs now and in the future must have flood management chapter and the existing SCMPs must be revised to reflect WDC Manual chapter 9.

Indicator 3:

<Knowledge management mechanism>

Knowledge management mechanism in the Project target area is defined by JPT as the structure to accumulate the experiences and lessons learned from the disaster management activities at community level, which will be accumulated by WRMA HQ, RO and SRO, as a result of discussions with WRMA/FMU counterparts. Specifically, the concept is an archive of the information that the person in charge has, as well as fragmented information scattered in each place, and the lessons learnt.

The procedure of flood situation survey and the survey sheet were prepared and are planned to be used in the next rainy season.

<Training system>

As described in Output 1 (indicator 1.3), training plan and training material were prepared and master trainers and trainers were fostered. WDC manual which is a core training material of the third stage training was finalized in April 2014 and it included flood management chapter. The third stage training was carried out for the members and leaders of Lower Gucha Migori (LOGUMI) WRUA by the chosen trainers fostered in the second stage training.

Budget for expansion of the second stage training has been included in the Annual Corporate Work Plan. Therefore, the training system on IFM was established.

Indicator 4:

IFM Expansion plan to 12 target river basins was prepared and the Annual Corporate Work plan and the budget were prepared by WRMA. In the Annual Plan, activities and budget for three Project target areas and the Nyando River were included.

Min 5: Next Step on Flood Management in WRMA

Eng. Joseph Kinyua, Technical Coordination Manager of WRMA presented the next steps on Flood Management in WRMA. The outline of the presentation is as follows and is shown in the **Attachment 4**:

1) Develop and implement effective flood management tools
2) Implementation of existing IFMPs for Isiolo, Taveta, Migori and Nyando
3) Development of projects and programs for flood mitigation
4) Carry out Detailed surveys in flood prone areas
5) Promote Partnerships
6) Modernize surface water resource monitoring networks
7) Implement the Constitutional Requirement on Capacity building of CGs
8) Enhance WRMA capacity to manage floods

Attachment List

1. **Attendance List**
2. **Project Design Matrix**
3. **Annual Corporate Work Plan for FY 2014/15**
4. **Next Step on Flood Management in WRMA**

Attachment 2: Project Design Matrix

Project Design Matrix Version 2

Project Name: The Project on Capacity Development for Effective Flood Management in Flood Prone Area

Creation date: 8 October 2013

Duration: July 2011 – June 2014 (3 years)

Target Group: Working Group in WRMA

	Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal	Institutional framework of flood management in the context of integrated water resource management is expanded to all of the six catchments.	· WRMA's Strategic Plan properly addresses flood management. · WRMA staff in charge of flood management has capacity to implement community based activities in the six catchments. · Flood management is incorporated in CMS and SCMP of flood prone areas in the six catchments · WRMA's knowledge management mechanism (knowledge management) and training system function covering the six catchments are established. · Budget for flood management is secured in the six catchments.	· Strategic Plan of WRMA · Training records and performance appraisal records · CMS and SCMP · WRMA's activity records and training records · ·Financial records	GOK maintains its strategy to promote flood management.
Project Purpose	In the Project target areas, institutional framework of flood management in the context of integrated water resource management is established for effective and sustainable implementation of community based activities.	· Staff of WRMA in charge of flood management in the project target areas has capacity to implement community based activities. · Flood management is incorporated in CMS and SCMP of flood prone areas in the project target areas. · WRMA's knowledge management mechanism (knowledge management) and triaging system function covering the project target areas are established. · Budget for flood management is secured in the project target areas.	· Training records, project records and performance appraisal records. · Strategies and plans in the project target areas. · WRMS's activity records and training records · Financial records	Budget and personnel for flood management is allocated as planned.
Outputs	1) At each level of WRMA (headquarters, regional offices and sub-regional offices), sustainable organizations in charge of flood management are strengthened.	1-1 A future plan of WRMA on flood management covering personnel, budget and function is prepared. 1-2 Catchment Management Strategies (CMSs) in the Project target areas properly integrate flood management. 1-3 Training plan, training material and trainers are prepared. 1-4 More than 12 % (40 numbers out of 319 technical staffs) of WRMA technical staffs attend training course by the end of this Project. 1-5 WRMA's institutional setup and budgetary systems for flood management are clearly defined and operated in the Project target areas.	1.1 Project records 1.2 CMS 1.3 Project records 1.4 Project records 1.5 Project records and financial records	· Trained staff continue working for WRMA · Residents in the pilot areas cooperate to the Project.
	2) For promoting community based activities of flood management, capacity of WRMA to support WRUAs and communities is strengthened.	2-1 Flood management plans in the pilot areas are prepared. 2-2 Materials describing the cases and lessons of the community based flood management activities are prepared. 2-3 More than 25 number of WRMA staffs have experience of community based flood management activities in the Project target areas.	2.1 Project records 2.2 Project records 2.3 Project records	

Attachment 2: Project Design Matrix

Activities	(1-1) Working Group (WG) analyzes the actual state of flood management at national, regional and sub-regional level respectively. (1-1-1) Institutional framework (1-1-2) Budget arrangement (1-1-3) Personnel allocation (1-1-4) Good practices (1-2) WRMA formulates a future plan of WRMA on flood management including personnel, budget and strategy. (1-3) WRMA elaborates Catchment Management Strategy (CMS) including flood management. (1-4) WRMA advises MWI to include a chapter of flood management in the National Water Resource Management Strategy (1-5) WRMA establishes a training system for WRMA staff. (1-5-1) Formulation of a training plan (1-5-2) Preparation of training manuals (1-5-3) Implementation of training courses for trainers (1-5-4) Implementation of training courses by the trainers (1-5-5) Evaluation and feedback of the outcomes from the training courses (1-5-6) Contribution to the relevant organization in terms of implementation of training courses (1-6) WRMA institutionalizes knowledge management mechanism at regional level and sub- regional level respectively (1-7) WRMA establishes institution and budgetary systems to address flood issues.	Inputs <u>Japan side</u> 1. Experts a) Chief Advisor / Flood management administration b) Flood management technology c) Community based disaster management d) Promotion of disaster management activity e) Institution / Training The other field will be considered when necessity arises 2. Equipment a) Office equipment (Personal computer and printer etc.) b) Project vehicles 3. C/P training in Japan 4. Facilities and equipment for community based activities a) sub-contracting cost for local consultant b) material and equipment cost for community based activities	<u>Kenya side</u> 1. Personnel allocation from Counter Part (C/P) a) Joint Coordinating Committee (JCC) b) Working Group (WG) 2. Budget allocation 3. Office Space and Facilities a) Office space b) Depot space for construction materials, vehicles and other necessary equipment 4. Local cost	Flood management Unit is established.

	(2-1) WRMA determines pilot sub-catchments. (2-2) WG establishes a coordinating function among relevant stakeholders such as flood management forum. (2-3) WRMA analyzes the current situations of communities.(Baseline survey) (2-3-1) Capacity assessment of community on flood management (2-3-2) Risk analysis including flood disaster map (2-4) JCC determines pilot areas based on a baseline survey. (2-5) WG facilitates communities to prepare flood management plans in the pilot areas to be integrated in Sub-Catchment Management Plan (SCMP) (2-5-1) Study on good practices (2-5-2) Participatory planning (2-6) WG supports the implementation of community based activities based on the flood management plans. (2-7) WG monitors and evaluates the community based activities. (2-8) WG prepares materials describing the cases and the lessons based on the community based activities. (2-9) WG contributes the cases and the lessons of the community based activities to the knowledge management mechanism.			

Attachment 3: Annual Corporate Work Plan for FY 2014/15

ANNUAL CORPORATE WORK PLAN FOR FY 2014/15

INDICATOR	OBJECTIVES	STRATEGIES	ACTIVITIES/PROJECTS	ANNUAL TARGETS	UNIT OF MEASURE	LEAD ACTOR	REGIONAL QUARTERLY TARGETS				Budget (Ksh. M)
							Q1	Q2	Q3	Q4	
SERVICE DELIVERY	2. To maintain efficiency and effectiveness in water resource planning and management	Modernize water resource monitoring networks	Mapping out all the flood prone areas within the 15No flood prone areas	1	Reports	DTCM(FM)					0.10
			Identify, map and monitor the monitoring stations for flood monitoring and prediction (weather and river monitoring stations)	2	No.	DTCM(FM)					-
			Establish/Rehabilitate/Upgrade targeted flood monitoring networks into realtime	18	No.	DTCM(FM)					5.00
		Improve water resource management tools	Mainstream flood management in RVCA Catchment Management Strategy	1	No.	DTCM(FM)					0.05
			Develop integrated River Basin Flood Management Plans for Awach Kano, Perkerra and Engare Narok(Rumuruti)	6	Draft IFMPs	DTCM(FM)					Below
			+ Execution of training for WRMA	*6*	No.	DTCM(FM)					2.00
			+ Execution of training for WRUA (2 Weeks) (Including drawing Community based hazard map)	*6*	No.	DTCM(FM)					-
			+ Reflecting IFM to SCMP (1 weeks)	*9*	No.	DTCM(FM)					Budget with CD
			+ Formurating and holding of IFMC	*18*	No.	DTCM(FM)					7.25
			+ Site survey and Collecting river basin data (Natural and Socio-economic condition, Development plan)	*6*	Reports	DTCM(FM)					0.60
			+ Drafting IFMP (Including plan of flood counter measures)	*6*	Reports	DTCM(FM)					0.60
			+ Site survey for flood damage data and Analysis of flood characteristics(after every flood for all 15No SRs)	*6*	reports	DTCM(FM)					3.00
			+ Fabrication and installation of FEWS for all SRs	*18*	No.	DTCM(FM)					0.60
			Implement integrated River Basin Flood Management Plans for Isiolo, Taveta, Lower Lumi and Nyando	3	No.	DTCM(FM)					8.00
		Carryout water resources assessment	Undertake flood impact studies for 6No among the 15No flood prone areas	6	reports	DTCM(FM)					0.60
		Service Delivery System	**Improve access to information by:**	100	%	DTCM(FM)					
			Prepare periodicals on flood management activities taking place in the flood prone areas	1	report	DTCM(FM)					0.05
		Carryout service delivery innovations	Operationalization of innovation (Convinient rain and water gauge)	1	No.	DTCM(FM)					0.30

		Implementation of the Constitution	Build capacity of the CGs on the FM	1	No.	DTCM(FM)					0.30
		Enhance Institutional automation	Provide a list of requirements of setting flood control rooms	1	No.	DTCM(FM)					-
DYNAMIC/ QUALITATIVE	5. To promote partnerships, build institutional capacity and Improve work environment	Promote Partnerships	**Partner with other institutions on:**								
			Carry out joint studies of flood prone areas (Modelling)	1	Report	DTCM(FM)					0.10
			Engage with County governments on legislation and planning (Pilot 6No Counties on capacity building of IFM) . Prepare project proposals	1	Report	DTCM(FM)					above
		Repairs: equip. and machinery	Implement repair schedule of key Flood monitoring stations.	1	Report	DTCM(FM)					0.20
		Maintenance: Machinery, Building and equipment	Implement maintenance schedule of key Flood monitoring stations.	1	Report	DTCM(FM)					above
		Research and development	Research, development and capacity building(Capacity build 6No Hydrologist(ATCM FM) on Flood prediction using Crest and IFAS models) and Flood Risk Modeling)	1	Report	DTCM(FM)					0.30
		Develop institutional competency	Identify skills gaps for training of ATCM-FM & FMOs	1	policy doc	DTCM(FM)					-
			Total								**28.95**

Attachment 4: Next Step on Flood Management in WRMA

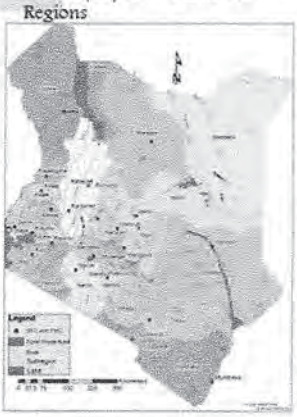
NEXT STEPS ON FLOOD MANAGEMENT IN WRMA

Presentation by:
Eng. Joseph Kinyua
31st JULY 2014

Presentation outline

1. Develop and implement effective flood management tools
2. Implementation of existing IFMPs for Isiolo, Taveta, Migori and Nyando
3. Development of projects and programs for flood mitigation
4. Carry out Detailed surveys in flood prone areas
5. Promote Partnerships
6. Modernize surface water resource monitoring networks
7. Implement the Constitutional Requirement on Capacity building of CGs
8. Enhance WRMA capacity to manage floods

Fifteen (15) Flood Prone Sub Regions



	Region	Sub Region
1	Athi	Nairobi
2		Loitokitok
3		Mombasa
4	Tana	Garissa
5	Ewaso Ngiro North	Isiolo
6		Rumuruti)
7		Mandera
8	Rift Valley	Lodwar
9		Narok
10		Kabarnet
11	Lake Victoria North	Siaya
12		Kitale
13	Lake Victoria South	Kisii
14		Kisumu
15		Kericho

1. Develop and implement effective flood management tools

This will entail Development of Integrated Flood management Plans

- Mainstream flood Management in our CMSs
- Execution of 3rd stage training of the WRUAs within the 12 river basins
- Mainstreaming IFM within the SCMPs
- Formulating the Integrated Flood Management committee (IFMC) in WRUAs
- Site survey and collecting data for natural and socio-economic.
- Development of the Integrated Flood Management Plans (IFMP) 12No for the next 3yrs as detailed below

I	Lower Sabaki	Athi	Kilifi	Mombasa
	Engare Narok Melhis(Rumuruti)	Ewaso Nyiro North Catchment Area	Nyandarua and Laikipia	Rumuruti
	Yala	Lake Victoria North Catchment Area	Siaya, Kakamega, Vihiga, Nandi, Nandi, Ewasin Gichu	Yala Swamp
	Awach Kano	Lake Victoria South Catchment Area	Kericho & Kisumu	Shoreline
	Perkerra	Rift Valley Catchment Area	Nakuru, Baringo & Laikipia	Mogotio
	Lower Tana	Tana	Garissa & Tana River	Garissa, Garsen
II	Mbagathi	Athi	Nairobi	Nairobi & Kitengela
	Daua	Ewaso Nyiro North Catchment Area	Mandera	Mandera
	Sabwani Trib of Nzoia	Lake Victoria North Catchment Area	Trans Nzoia	Kitale
	Sondu	Lake Victoria South Catchment Area	Kericho, Kisumu	
	Ewaso Ngiro South (Narok urban centre)	Rift Valley Catchment Area	Narok	Narok
	Thiba	Tana	Embu	Mwea

Flood prone areas targeted by WRMA

12No flood prone areas to be covered within 3years

2. Implementation of existing IFMPs for Isiolo, Taveta, Migori and Nyando

- Incorporating IFMP activities into the WRMA Annual work plans and budget
- Supporting WRUAs in SCMP development incorporating FM
- Advocating for the community based FM approach in County Integrated development Plans

3. Development of projects for FM mitigation

To support the development of projects and programs for the implementation of flood mitigation strategies. This will include;

- WRMA supporting the WRUAs in proposal writing
- WRMA will prepare large project proposals for financing by partners
- WRMA providing quality assurance to financiers on the proper use of funds given to WRUAs

Attachment 4: Next Step on Flood Management in WRMA

4. Carry out Detailed surveys

- Undertake flood impact studies for 6 No river basins
- Carry out joint studies i.e. Modelling of flood prone areas with stakeholders
- Research, development and capacity building(Capacity build 6No Hydrologist(ATCM FM) on Flood prediction using Crest and IFAS models) and Flood Risk Modeling among others)

5. Promote Partnerships

- Engage with County governments on legislation and FM planning (Pilot 6No Counties on capacity building of IFM)
- Learning from best practices in IFM from other parts of the world and domesticating the knowledge so gained

6. Modernize surface water resource monitoring networks

- Identify, map, operationalize and collect real time information from the monitoring stations for flood monitoring and prediction (weather and river monitoring stations)
- Flood Risk Modeling - Use of a hydrodynamic model for determining vulnerability to floods, flood return period/hazard mapping, and project impacts under various flow regimes

7. Implementation of the Constitution

In the fourth Schedule part 1 sec 32.of the Constitution of Kenya 2010, the National Government has a duty to capacity built the CGs.

- WRMA will capacity built CGs staff on Water Resources Management in general and IFM in particular.
- WRMA will also disseminate the interventions proposed in the National Water Master Plan 2030 to the CGs

8. Enhance WRMA capacity to manage floods

- Determine requirements for setting up flood operations control rooms
- Establish the Flood operations control rooms in various WRMA offices
- Identify skills gaps for training of ATCM-FMs & FMOs
- Implement capacity building program to bridge the identified skills gaps

Concluding Remarks

- The project on capacity building for Flood Management in flood prone areas of Kenya has provided good opportunity for WRMA/WRUA to effectively participate in flood management activities.
- It is WRMA's hope that this technical cooperation between Kenya and Japan will be strengthened for our mutual benefit.

End of Presentation

Thank you for your kind attention

End