

# *Attachments*

*Attachment D2*  
*JICA EIA Checklists*

# JICA CHECKLIST

## Construction and Improvement of Water Supply Pipeline in Arapal, Loiyangalani District, Marsabit County

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
<b>1 Permits and Explanation</b>	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a)Y (b)Y (c)Y (d)Y	(a) The EIA report has been prepared following the guidelines required by the National Environment Management Authority (NEMA) (b) The EIA report has been approved by NEMA (c) However, the project must adhere to the recommendations of EIA findings. The proponent/executants should undertake monitoring and evaluation to understand if the project is meeting its long-term objectives and sustainability. (d) Adequate consultations with the relevant government authorities have been undertaken and the project explained to them. No special permits are required for the project
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a)Y (b)Y	(a) Adequate consultation and discussions with the communities have been undertaken and the project has been explained to them. (b) The comments of the local residents have been obtained. Overall, the local residents are in support of the project and donated the proposed site for the project.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a)Y	(a) Through EIA, the social and environmental impacts of the project have been documented and the required mitigation measures for the negative impacts of the project proposed.
<b>2 Pollution Control</b>	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a)N (b)N	(a) Alteration of water quality if probable from the project, but the impacts will not be enormous. Monitoring of the potential water quality changes/alterations have been proposed from the EIA study. (b) Monitoring framework of potential water quality change from the project is yet to be developed, but this will be decided as part of the monitoring and evaluation of the project after the completion of the project
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a)Y	(a) Plans for waste management from the project are explained in the EIA report
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any	(a)N (b)Y (c)N	(a) No impacts on soil contamination are anticipated from the project, but monitoring of soil quality would be necessary. (b) EIA report provides detailed account on how potential soil contamination shall be mitigated. (c) No agrochemicals impacts are anticipated from the project, but a

		implementation structures organized for proper use of the plans?		monitoring plan to be developed shall take this important aspect into consideration
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a)N	(a)
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a)N	(a) No impacts anticipated
<b>3 Natural Environment</b>	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a)N	(a) The project will neither affect protected area or species of conservation concern
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a)N (b)N (c)N (d)Y (e)Y	(a)N/A (b)N/A (c)N/A (d) Degradation from overgrazing is anticipated near the project site, but the impacts shall be minimal and shall be controlled through community involvement in regulation of grazing regime near the project site. (e) No significant ecological impacts anticipated
<b>4 Social Environment</b>	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Is the compensations going to be paid prior to the resettlement? (e) Is the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the	(a)N (b)N (c)N (d)N (e)N (f)N (g)N (h)N (i)N (j)N	(a) The scale of the project does not involve involuntary resettlement or displacement of the residents around the project site (b)N/A (c)N/A (d)N/A (e)N/A (f)N/A (g)N/A (h)N/A (i)N/A (j)N/A

		impacts of resettlement? (j) Is the grievance redress mechanism established?		
<b>4 Social Environment</b>	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?(b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources? (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?	(a)N (b)Y (c)Y (d)N (e)N	(a) The project has been designed and prioritized based on the consultations with the local communities, and will among others improve their livelihoods and resilience to the adverse effects of climate change.(b) The community donated the land where the project shall be undertaken. Additionally, all relevant procedures were followed for the allotment of the project site.)
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a)N	(a) The project location is not within any local archeological site
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a)N	(a) Although the project is likely to change the local landscape through the introduction of a new feature courtesy of the project, the activity will not adversely affect the landscape features and structures.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a)Y (b)Y	(a) Adequate consultations were undertaken, considerations of the likely impacts of project on the cultures and minorities taken into consideration. (b) All communities and clans around the project site have been adequately involved in the project planning, discussions and consultations.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a)N (b)Y (c)Y (d)Y	(a) No laws and regulations have been violated by the project. Indeed the project is a priority under the Kenya's economic blueprint - the Vision 2030. (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities (d) Contractor to take this aspect into consideration during the project activities

<b>5 Others</b>	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a)Y (b)Y (c)Y	(a) Contractor to take this aspect into consideration during the project activities(b) Contractor to take this aspect into consideration during the project activities(c) Contractor to take this aspect into consideration during the project activities
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a)Y (b)N (c)N (d)Y	(a)TBA (b)TBA (c)TBA (d) TBA
<b>6 Note</b>	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked.	(a)N (b) N	(a)N/A (b) N/A
	Note on Using Environmental Checklist	(a) If necessary, the impacts to trans-boundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as trans-boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a)N	(a) The project location is not within a trans-boundary
<p>1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).</p> <p>2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.</p>				

# JICA CHECKLIST

## Construction of Livestock Market Yard in Dirib Location, Marsabit Central District, Marsabit County

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
<b>1 Permits and Explanation</b>	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a)Y (b)Y (c)Y (d)Y	(a) The EIA report has been prepared following the guidelines required by the National Environment Management Authority (NEMA) (b) The EIA report has been approved by NEMA (c) However, the project must adhere to the recommendations of EIA findings. The proponent/executant should undertake monitoring and evaluation to understand if the project is meeting its long-term objectives and sustainability. (d) Adequate consultations with the relevant government authorities have been undertaken and the project explained to them. No special permits are required for the project
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a)Y (b)Y	(a) Adequate consultation and discussions with the communities have been undertaken and the project has been explained to them. (b) The comments of the local residents have been obtained. Overall, the local residents are in support of the project and donated the proposed site for the project.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a)Y	(a) Through EIA, the social and environmental impacts of the project have been documented and the required mitigation measures for the negative impacts of the project proposed.
<b>2 Pollution Control</b>	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a)N (b)N	(a) Alteration of water quality if probable from the project, but the impacts will not be enormous. Monitoring of the potential water quality changes/alterations have been proposed from the EIA study. (b) Monitoring framework of potential water quality change from the project is yet to be developed, but this will be decided as part of the monitoring and evaluation of the project after the completion of the project
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a)Y	(a) Plans for waste management from the project are explained in the EIA report

	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a)N (b)Y (c)N	(a) No impacts on soil contamination are anticipated from the project, but monitoring of soil quality would be necessary. (b) EIA report provides detailed account on how potential soil contamination shall be mitigated. (c) No agrochemicals impacts are anticipated from the project, but a monitoring plan to be developed shall take this important aspect into consideration
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a)N	(a)
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a)N	(a) No impacts anticipated
<b>3 Natural Environment</b>	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a)N	(a) The project will neither affect protected area or species of conservation concern
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a)N (b)N (c)N (d)Y (e)Y	(a)N/A (b)N/A (c)N/A (d) Degradation from overgrazing is anticipated near the project site, but the impacts shall be minimal and shall be controlled through community involvement in regulation of grazing regime near the project site. (e) No significant ecological impacts anticipated



<p><b>4 Social Environment</b></p>	<p>(1) Resettlement</p>	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?  (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?  (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?  (d) Is the compensations going to be paid prior to the resettlement?  (e) Is the compensation policies prepared in document?  (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?  (g) Are agreements with the affected people obtained prior to resettlement?  (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?  (i) Are any plans developed to monitor the impacts of resettlement?  (j) Is the grievance redress mechanism established?</p>	<p>(a)N  (b)N  (c)N  (d)N  (e)N  (f)N  (g)N  (h)N  (i)N  (j)N</p>	<p>(a) The scale of the project does not involve involuntary resettlement or displacement of the residents around the project site  (b)N/A  (c)N/A  (d)N/A  (e)N/A  (f)N/A  (g)N/A  (h)N/A  (i)N/A  (j)N/A</p>
<p><b>4 Social Environment</b></p>	<p>(2) Living and Livelihood</p>	<p>(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?(b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources?  (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?</p>	<p>(a)N  (b)Y  (c)Y  (d)N  (e)N</p>	<p>(a) The project has been designed and prioritized based on the consultations with the local communities, and will among others improve their livelihoods and resilience to the adverse effects of climate change.(b) The community donated the land where the project shall be undertaken. Additionally, all relevant procedures were followed for the allotment of the project site.)</p>
	<p>(3) Heritage</p>	<p>(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	<p>(a)N</p>	<p>(a) The project location is not within any local archeological site</p>

	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a)N	(a) Although the project is likely to change the local landscape through the introduction of a new feature courtesy of the project, the activity will not adversely affect the landscape features and structures.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a)Y (b)Y	(a) Adequate consultations were undertaken, considerations of the likely impacts of project on the cultures and minorities taken into consideration. (b) All communities and clans around the project site have been adequately involved in the project plannings, discussions and consultations.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a)N (b)Y (c)Y (d)Y	(a) No laws and regulations have been violated by the project. Indeed the project is a priority under the Kenya's economic blueprint - the Vision 2030. (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities (d) Contractor to take this aspect into consideration during the project activities
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a)Y (b)Y (c)Y	(a) Contractor to take this aspect into consideration during the project activities(b) Contractor to take this aspect into consideration during the project activities(c) Contractor to take this aspect into consideration during the project activities
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a)Y (b)N (c)N (d)Y	(a)TBA (b)TBA (c)TBA (d) TBA

<b>6 Note</b>	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked.	(a)N (b)N	(a)N/A (b) N/A
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as trans-boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a)N	(a) The project location is not within a transboundary
<p>1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).</p> <p>2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.</p>				

## JICA CHECKLIST

### Dololo Dokatu Water Pan and 15km temporary access road in Qachacha Dirib Location, Marsabit Central District, Marsabit County

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
<b>1 Permits and Explanations</b>	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) Y (c) Y (d) Y	(a) The EIA report has been prepared following the guidelines required by the National Environment Management Authority (NEMA) (b) The EIA report has been approved by NEMA (c) However, the project must adhere to the recommendations of EIA findings. The proponent/executant should undertake monitoring and evaluation to understand if the project is meeting its long-term objectives and sustainability. (d) Adequate consultations with the relevant government authorities have been undertaken and the project explained to them. No special permits are required for the project
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Adequate consultation and discussions with the communities have been undertaken and the project has been explained to them. (b) The comments of the local residents have been obtained. Overall, the local residents are in support of the project and donated the proposed site for the project.
	(3) Examination of	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Through EIA, the social and environmental impacts of the project have been documented and the required

	Alternatives			mitigation measures for the negative impacts of the project proposed.
<b>2 Pollution Control</b>	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a) N (b) N	(a) Alteration of water quality if probable from the project, but the impacts will not be enormous. Monitoring of the potential water quality changes/alterations have been proposed from the EIA study. (b) Monitoring framework of potential water quality change from the project is yet to be developed, but this will be decided as part of the monitoring and evaluation of the project after the completion of the project
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) Plans for waste management from the project are explained in the EIA report
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a) N (b) Y (c) N	(a) No impacts on soil contamination are anticipated from the project, but monitoring of soil quality would be necessary. (b) EIA report provides detailed account on how potential soil contamination shall be mitigated. (c) No agrochemicals impacts are anticipated from the project, but a monitoring plan to be developed shall take this important aspect into consideration
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a)
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a) N	(a) No impacts anticipated
<b>3 Natural Environment</b>	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The project will neither affect protected area or species of conservation concern
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a) N (b) N (c) N (d) Y (e) Y	(a)N/A (b)N/A (c)N/A (d) Degradation from overgrazing is anticipated near the project site, but the impacts shall be minimal and shall be controlled through community involvement in regulation of grazing regime near the project site. (e) No significant ecological impacts anticipated

4 Social Environment	(1) Resettlement	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Is the compensations going to be paid prior to the resettlement?</p> <p>(e) Is the compensation policies prepared in document?</p> <p>(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	<p>(a) N (b) N (c) N (d) N (e) N (f) N (g) N (h) N (i) N (j) N</p>	<p>(a) The scale of the project does not involve involuntary resettlement or displacement of the residents around the project site (b)N/A (c)N/A (d)N/A (e)N/A (f)N/A (g)N/A (h)N/A (i)N/A (j)N/A</p>
4 Social Environment	(2) Living and Livelihood	<p>(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?(b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources? (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?</p>	<p>(a) N (b)Y (c)Y (d)N (e)N</p>	<p>(a) The project has been designed and prioritized based on the consultations with the local communities, and will among others improve their livelihoods and resilience to the adverse effects of climate change.(b) The community donated the land where the project shall be undertaken. Additionally, all relevant procedures were followed for the allotment of the project site.)</p>
	(3) Heritage	<p>(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	<p>(a) N</p>	<p>(a) The project location is not within any local archeological site</p>

	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) Although the project is likely to change the local landscape through the introduction of a new feature courtesy of the project, the activity will not adversely affect the landscape features and structures.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) Y (b) Y	(a) Adequate consultations were undertaken, considerations of the likely impacts of project on the cultures and minorities taken into consideration. (b) All communities and clans around the project site have been adequately involved in the project planning, discussions and consultations.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) N (b) Y (c) Y (d) Y	(a) No laws and regulations have been violated by the project. Indeed the project is a priority under the Kenya's economic blueprint - the Vision 2030. (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities (d) Contractor to take this aspect into consideration during the project activities
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) Y (b) Y (c) Y	(a) Contractor to take this aspect into consideration during the project activities(b) Contractor to take this aspect into consideration during the project activities(c) Contractor to take this aspect into consideration during the project activities
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) N (c) N (d) Y	(a) TBA (b) TBA (c) TBA (d) TBA

<b>6 Note</b>	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked.	(a) N (b) N	(a) N/A (b) N/A
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) N	(a) The project location is not within a transboundary
<p>1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).</p> <p>2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.</p>				

## JICA CHECKLIST

### Dadach Man Churre Water Pan In Gar Qarsa Sub-Location, Marsabit Central District, Marsabit County

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
<b>1 Permits and Explanation</b>	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) Y (c) Y (d) Y	(a) The EIA report has been prepared following the guidelines required by the National Environment Management Authority (NEMA) (b) The EIA report has been approved by NEMA (c) However, the project must adhere to the recommendations of EIA findings. The proponent/executant should undertake monitoring and evaluation to understand if the project is meeting its long-term objectives and sustainability. (d) Adequate consultations with the relevant government authorities have been undertaken and the project explained to them. No special permits are required for the project
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Adequate consultation and discussions with the communities have been undertaken and the project has been explained to them. (b) The comments of the local residents have been obtained. Overall, the local residents are in support of the project and donated the proposed site for the project.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Through EIA, the social and environmental impacts of the project have been documented and the

				required mitigation measures for the negative impacts of the project proposed.
<b>2 Pollution Control</b>	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a) N (b) N	(a) Alteration of water quality if probable from the project, but the impacts will not be enormous. Monitoring of the potential water quality changes/alterations have been proposed from the EIA study. (b) Monitoring framework of potential water quality change from the project is yet to be developed, but this will be decided as part of the monitoring and evaluation of the project after the completion of the project
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) Plans for waste management from the project are explained in the EIA report
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a) N (b) Y (c) N	(a) No impacts on soil contamination are anticipated from the project, but monitoring of soil quality would be necessary. (b) EIA report provides detailed account on how potential soil contamination shall be mitigated. (c) No agrochemicals impacts are anticipated from the project, but a monitoring plan to be developed shall take this important aspect into consideration
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a)
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a) N	(a) No impacts anticipated
<b>3 Natural Environment</b>	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The project will neither affect protected area or species of conservation concern
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a) N (b) N (c) N (d) Y (e) Y	(a)N/A (b)N/A (c)N/A (d) Degradation from overgrazing is anticipated near the project site, but the impacts shall be minimal and shall be controlled through community involvement in regulation of grazing regime near the project site. (e) No significant ecological impacts anticipated



<b>Social Environment</b>	(1) Resettlement	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Is the compensations going to be paid prior to the resettlement?</p> <p>(e) Is the compensation policies prepared in document?</p> <p>(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	<p>(a) N (b) N (c) N (d) N (e) N (f) N (g) N (h) N (i) N (j) N</p>	<p>(a) The scale of the project does not involve involuntary resettlement or displacement of the residents around the project site (b)N/A (c)N/A (d)N/A (e)N/A (f)N/A (g)N/A (h)N/A (i)N/A (j)N/A</p>
<b>Social Environment</b>	(2) Living and Livelihood	<p>(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?(b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources? (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?</p>	<p>(a) N (b)Y (c)Y (d)N (e)N</p>	<p>(a) The project has been designed and prioritized based on the consultations with the local communities, and will among others improve their livelihoods and resilience to the adverse effects of climate change.(b) The community donated the land where the project shall be undertaken. Additionally, all relevant procedures were followed for the allotment of the project site.)</p>
	(3) Heritage	<p>(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	<p>(a) N</p>	<p>(a) The project location is not within any local archeological site</p>
	(4) Landscape	<p>(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	<p>(a) N</p>	<p>(a) Although the project is likely to change the local landscape through the introduction of a new feature</p>

				courtesy of the project, the activity will not adversely affect the landscape features and structures.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) Y (b) Y	(a) Adequate consultations were undertaken, considerations of the likely impacts of project on the cultures and minorities taken into consideration. (b) All communities and clans around the project site have been adequately involved in the project plannings, discussions and consultations.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) N (b) Y (c) Y (d) Y	(a) No laws and regulations have been violated by the project. Indeed the project is a priority under the Kenya's economic blueprint - the Vision 2030. (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities (d) Contractor to take this aspect into consideration during the project activities
<b>5 Others</b>	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) Y (b) Y (c) Y	(a) Contractor to take this aspect into consideration during the project activities (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) N (c) N (d) Y	(a)TBA (b)TBA (c)TBA (d) TBA
<b>6 Note</b>	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and	(a)N (b) N	(a)N/A (b) N/A

		Reservoirs checklist should also be checked.		
	Note on Using Environmental Checklist	(a) If necessary, the impacts to trans-boundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as trans-boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) N	(a) The project location is not within a trans-boundary
<p>1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).</p> <p>2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.</p>				

## JICA CHECKLIST

### Rehabilitation of Yaa Gala in Hurri Hills Location, Marsabit North District, Marsabit County

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) Y (c) Y (d) Y	(a) The EIA report has been prepared following the guidelines required by the National Environment Management Authority (NEMA) (b) The EIA report has been approved by NEMA (c) The project has been approved with conditions that must adhere to the recommendations of EIA findings. The proponent/executants should undertake regular monitoring and evaluation to understand if the project is meeting its long-term objectives and sustainability. (d) Adequate consultations with the relevant government authorities have been undertaken and the project explained to them. No special permits are required for the project
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Adequate consultation and discussions with the communities have been undertaken and the project has been explained to them. (b) The comments of the local residents have been obtained. Overall, the local residents are in support of the project and donated the proposed site for the project.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Through EIA, the social and environmental impacts of the project have been documented and the required mitigation measures for the potential negative impacts of the project proposed.

<b>2 Pollution Control</b>	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a) N (b) N	(a) Alteration of water quality is probable from the project, but the impacts will not be enormous. Monitoring of the potential water quality changes/alterations have been proposed from the EIA study. (b) Monitoring framework of potential water quality changes from the project is yet to be developed, but this will be decided as part of the monitoring and evaluation of the project after the completion of the project
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) Plans for waste management and mitigation strategies from the project are explained in the EIA report
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a) N (b) Y (c) N	(a) No impacts on soil contamination are anticipated from the project, but monitoring of soil quality would be necessary. (b) EIA report provides detailed account on how potential soil contamination shall be mitigated. (c) No agrochemicals impacts are anticipated from the project, but a monitoring plan to be developed shall take this important aspect into consideration
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a) The project does not involve the extraction of ground water. As such the impacts on ground water volume changes is not anticipated.
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a) N	(a) No impacts anticipated
<b>3 Natural Environ ment</b>	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The project will neither affect protected area or species of conservation concern. The proposed site is not within or around a protected area
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a) N (b) N (c) N (d) Y (e) Y	(a)N/A (b)N/A (c)N/A (d) Degradation from overgrazing is anticipated near the project site, but the impacts shall be minimal and shall be controlled through community involvement in regulation of grazing regime near the project site. (e) No significant ecological impacts anticipated

<b>4 Social Environment</b>	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Is the compensations going to be paid prior to the resettlement? (e) Is the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts of resettlement? (j) Is the grievance redress mechanism established?	(a) N (b) N (c) N (d) N (e) N (f) N (g) N (h) N (i) N (j) N	(a) The scale of the project does not involve involuntary resettlement or displacement of the residents around the project site (b)N/A (c)N/A (d)N/A (e)N/A (f)N/A (g)N/A (h)N/A (i)N/A (j)N/A
<b>4 Social Environment</b>	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary? (b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources? (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?	(a) N (b)Y (c)Y (d)N (e)N	(a) The project has been designed and prioritized based on the consultations with the local communities, and will among others improve their livelihoods and resilience to the adverse effects of climate change. (b) The community donated the land where the project shall be undertaken. Additionally, all relevant procedures were followed for the allotment of the project site.)
	(3) Heritage	(a) Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) The project location is not within any known archaeological site

	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) Although the project is likely to change the local landscape through the introduction of a new feature courtesy of the project, the activity will not significantly and adversely affect the landscape features and structures.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) Y (b) Y	(a) Adequate consultations were undertaken, considerations of the likely impacts of project on the cultures and minorities taken into consideration. (b) All communities and clans around the project site have been adequately involved in the project planning, discussions and consultations.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) N (b) Y (c) Y (d) Y	(a) No laws and regulations have been violated by the project. Indeed the project is a priority under the Kenya's economic blueprint - the Vision 2030. (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities (d) Contractor to take this aspect into consideration during the project activities
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) Y (b) Y (c) Y	(a) Contractor to take this aspect into consideration during the project activities (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) N (c) N (d) Y	(a) TBA (b) TBA (c) TBA (d) TBA

<b>6 Note</b>	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked.	(a)N (b)N	(a)N/A (b) N/A
	Note on Using Environmental Checklist	(a) If necessary, the impacts to trans-boundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as trans-boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a)N	(a) The project location is not within a trans-boundary area
<p>1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).</p> <p>2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.</p>				

## JICA CHECKLIST

### Satawesa Water Pan and Temporary 6km Access Road in Turbi Location, Marsabit North District, Marsabit County

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
<b>1 Permits and Explanations</b>	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) Y (c) Y (d) Y	(a) The EIA report has been prepared following the guidelines required by the National Environment Management Authority (NEMA) (b) The EIA report has been approved by NEMA (c) However, the project must adhere to the recommendations of EIA findings. The proponent/executants should undertake monitoring and evaluation to understand if the project is meeting its long-term objectives and sustainability. Additionally the approval conditions have been met accordingly by the project proponent (d) Adequate consultations with the relevant government authorities have been undertaken and the project explained to them. No special permits are required for the project
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Adequate consultation and discussions with the affected communities have been undertaken and the project objectives explained to them accordingly. (b) The comments of the local residents have been obtained. Overall, the local residents are in support of the project and donated the proposed site for the project.

	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Through EIA, the social and environmental impacts of the project have been documented and the required mitigation measures for the negative impacts of the project proposed.
<b>2 Pollution Control</b>	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a) N (b) N	(a) Monitoring of the potential water quality changes/alterations have been proposed from the EIA study. (b) Monitoring framework of potential water quality change from the project is yet to be developed, but this will be decided as part of the monitoring and evaluation of the project after the completion of the project
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) Plans for waste management from the project are explained in the EIA report
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a) N (b) Y (c) N	(a) No impacts on soil contamination are anticipated from the project, but monitoring of soil quality would be necessary. (b) EIA report provides detailed account on how potential soil contamination shall be mitigated. (c) No agrochemicals impacts are anticipated from the project, but a monitoring plan to be developed shall take this important aspect into consideration
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a) The project does not impact on water volume through extraction processes. Rather the project will rely on seasonal flooding during rain seasons
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a) N	(a) No impacts anticipated
<b>3 Natural Environment</b>	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The project will neither affect protected area or species of conservation concern. It is not located within or around a protected wildlife area
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts	(a) N (b) N (c) N (d) Y (e) Y	(a)N/A (b)N/A (c)N/A (d) Degradation from overgrazing is anticipated near the project site, but the impacts shall be minimal and shall be controlled through community involvement in regulation of grazing regime near the project site. (e) No significant ecological impacts anticipated



		on the ecosystem?		
<b>4 Social Environment</b>	(1) Resettlement	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Is the compensations going to be paid prior to the resettlement?</p> <p>(e) Is the compensation policies prepared in document?</p> <p>(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	<p>(a) N (b) N (c) N (d) N (e) N (f) N (g) N (h) N (i) N (j) N</p>	<p>(a) The scale of the project does not involve involuntary resettlement or displacement of the residents around the project site (b)N/A (c)N/A (d)N/A (e)N/A (f)N/A (g)N/A (h)N/A (i)N/A (j)N/A</p>
<b>4 Social Environment</b>	(2) Living and Livelihood	<p>(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>(b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources?</p> <p>(c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources?</p> <p>(d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely the downstream fisheries and water uses?</p> <p>(e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?</p>	<p>(a) N (b)Y (c)Y (d)N (e)N</p>	<p>(a) The project has been designed and prioritized based on the consultations with the local communities, and will among others improve their livelihoods and resilience to the adverse effects of climate change. (b) The community donated the land where the project shall be undertaken. Additionally, all relevant procedures were followed for the allotment of the project site.</p>
	(3) Heritage	<p>(a) Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage? Are adequate measures</p>	<p>(a) N</p>	<p>(a) The project location is not within any local archaeological site</p>

		considered to protect these sites in accordance with the country's laws?		
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) Although the project is likely to change the local landscape through the introduction of a new feature courtesy of the project, the activity will not adversely affect the landscape features and structures.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) Y (b) Y	(a) Adequate consultations were undertaken, considerations of the likely impacts of project on the cultures and minorities taken into consideration. (b) All communities and clans around the project site have been adequately involved in the project planning, discussions and consultations.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a)N (b)Y (c)Y (d)Y	(a) No laws and regulations have been violated by the project. Indeed the project is a priority under the Kenya's economic blueprint - the Vision 2030. (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities (d) Contractor to take this aspect into consideration during the project activities
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a)Y (b)Y (c)Y	(a) Contractor to take this aspect into consideration during the project activities(b) Contractor to take this aspect into consideration during the project activities(c) Contractor to take this aspect into consideration during the project activities
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a)Y (b)N (c)N (d)Y	(a)TBA (b)TBA (c)TBA (d) TBA

<b>6 Note</b>	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked.	(a)N (b)N	(a)N/A (b)N/A
	Note on Using Environmental Checklist	(a) If necessary, the impacts to trans-boundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as trans-boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) N	(a) The project location is not within a trans-boundary
<p>1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).</p> <p>2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.</p>				

## JICA CHECKLIST

### Construction of Lekuchula Rock Catchment in Ngurunit, Marsabit South District, Marsabit

#### County

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
<b>1 Permits and Explanation</b>	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) Y (c) Y (d) Y	(a) The EIA report has been prepared following the guidelines required by the National Environment Management Authority (NEMA) (b) The EIA report has been approved by NEMA (c) However, the project must adhere to the recommendations of EIA findings and the NEMA approval conditions. (d) Adequate consultations with the relevant government authorities have been undertaken and the project explained to them. No special permits are required for the project
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Adequate consultation and discussions with the communities have been undertaken and the project has been explained to them. (b) Overall, the local residents are in support of the project and donated the proposed site for the project.

	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Through EIA, the social and environmental impacts of the project have been documented and the required mitigation measures for the negative impacts of the project proposed.
<b>2 Pollution Control</b>	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a) N (b) N	(a) Monitoring of the potential water quality changes/alterations have been proposed from the EIA study. (b) Monitoring framework of potential water quality change from the project is yet to be developed, but this will be decided as part of the monitoring and evaluation of the project after the completion of the project
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) Plans for waste management from the project are explained in the EIA report
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a) N (b) Y (c) N	(a) No impacts on soil contamination are anticipated from the project, but monitoring of soil quality would be necessary. (b) EIA report provides detailed account on how potential soil contamination shall be mitigated. (c) No agrochemicals impacts are anticipated from the project, but a monitoring plan to be developed shall take this important aspect into consideration
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a)
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a) N	(a) No impacts anticipated
<b>3 Natural Environment</b>	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The project is not located in a location within or around a wildlife protected area
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a) N (b) N (c) N (d) Y (e) Y	(a) N/A (b) N/A (c) N/A (d) Degradation from overgrazing is anticipated near the project site, but the impacts shall be minimal and shall be controlled through community involvement in regulation of grazing regime near the project site. (e) No significant ecological impacts anticipated
<b>4</b>	(1)	(a) Is involuntary resettlement caused by	(a) N	(a) The scale of the project does not

<b>Social Environment</b>	Resettlement	<p>project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Is the compensations going to be paid prior to the resettlement?</p> <p>(e) Is the compensation policies prepared in document?</p> <p>(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	(b)N (c)N (d)N (e)N (f)N (g)N (h)N (i)N (j)N	involve involuntary resettlement or displacement of the residents around the project site (b)N/A (c)N/A (d)N/A (e)N/A (f)N/A (g)N/A (h)N/A (i)N/A (j)N/A
<b>4 Social Environment</b>	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?(b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources? (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?	(a) N (b)Y (c)Y (d)N (e)N	(a) The project has been designed and prioritized based on the consultations with the local communities, and will among others improve their livelihoods and resilience to the adverse effects of climate change. (b) All relevant procedures were followed for the allotment of the project site.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) The project location is not within or around any local archaeological site
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) The project will not adversely affect the landscape features and structures.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) Y (b) Y	(a) Adequate consultations were undertaken, considerations of the likely impacts of project on the cultures and minorities taken into consideration. (b) All communities and clans around the project site have been

				adequately involved in the project discussions and consultations.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) N (b) Y (c) Y (d) Y	(a) No laws and regulations have been violated by the project. (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities (d) Contractor to take this aspect into consideration during the project activities
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) Y (b) Y (c) Y	(a) Contractor to take this aspect into consideration during the project activities (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) N (c) N (d) Y	(a)TBA (b)TBA (c)TBA (d)TBA
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked.	(a)N (b) N	(a)N/A (b)N/A
	Note on Using Environmental Checklist	(a) If necessary, the impacts to trans-boundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as trans-boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) N	(a) The project location is not within a transboundary
1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).				

- 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.

## JICA CHECKLIST

### Kalacha Goda feedlot project in Kalacha Location, Marsabit North District, Marsabit County

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) Y (c) Y (d) Y	(a) The EIA report has been prepared following the guidelines required by the National Environment Management Authority (NEMA) (b) The EIA report has been approved by NEMA (c) The proponent/executant should undertake monitoring and evaluation to understand if the project is meeting its long-term objectives and sustainability. (d) No special permits are required for the project
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Adequate consultation and discussions with the communities have been undertaken and the project has been explained to them. (b) The comments of the local residents have been obtained. Overall, the local residents are in support of the project and donated the proposed site for the project.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Through EIA, the social and environmental impacts of the project have been documented and the required mitigation measures for the negative impacts of the project proposed.
2 Pollution Control	(1) Water Quality	(a) Are considerations given to water pollution of the surrounding water bodies, such as rivers and groundwater by effluents or leachates from agricultural lands? Are adequate use/disposal standards for fertilizers, agrochemicals, and livestock wastes established? Is a framework established to increase awareness of the standards among farmers? (b) Is a monitoring framework established for water pollution of rivers and groundwater?	(a) N (b) N	(a) Alteration of water quality is probable from the project, but the impacts will not be enormous. Monitoring of the potential water quality changes/alterations have been proposed from the EIA study. (b) Monitoring framework of potential water quality change from the project is yet to be developed, but this will be decided as part of the monitoring and evaluation of the project after the completion of the project
	(2) Wastes	(a) Are wastes properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) Plans for waste management from the project are explained in the EIA report
	(3) Soil Contamination	(a) Is there a possibility that impacts in irrigated lands, such as salinization of soils will result? (b) Are adequate measures taken to prevent soil contamination of irrigated lands by agrochemicals, heavy metals and other hazardous substances? (c) Are any agrochemicals management plans prepared? Are any usages or any implementation structures organized for proper use of the plans?	(a) N (b) Y (c) N	(a) No impacts on soil contamination are anticipated from the project, but regular monitoring of soil quality would be necessary. (b) EIA report provides detailed account on how potential soil contamination shall be mitigated. (c) No agrochemicals impacts are anticipated from the project, but a monitoring plan to be developed shall take this important aspect into

				consideration
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a) The does not involve large-scale extraction ground water
	(5) Odor	(a) Are there any odor sources? Is there a possibility that odor problems will occur to the inhabitants?	(a) N	(a) No impacts anticipated
<b>3 Natural Environment</b>	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The project will neither affect protected area or species of conservation concern
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that the project will result in the loss of breeding and feeding grounds for valuable wildlife? If they are lost, are there substitutes for the grounds near the original locations? (d) Is there a possibility that overgrazing will cause ecological degradation, such as impacts on wildlife habitats and desertification? (e) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(a) N (b) N (c) N (d) Y (e) Y	(a)N/A (b)N/A (c)N/A (d) Degradation from overgrazing is anticipated near the project site, but the impacts shall be minimal and shall be controlled through community involvement in regulation of grazing regime near the project site. (e) No significant ecological impacts anticipated
<b>4 Social Environment</b>	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Is the compensations going to be paid prior to the resettlement? (e) Is the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts of resettlement? (j) Is the grievance redress mechanism established?	(a) N (b) N (c) N (d) N (e) N (f) N (g) N (h) N (i) N (j) N	(a) The scale of the project does not involve involuntary resettlement or displacement of the residents around the project site (b)N/A (c)N/A (d)N/A (e)N/A (f)N/A (g)N/A (h)N/A (i)N/A (j)N/A



<b>4 Social Environment</b>	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?(b) Is proper allotment made for rights to agricultural land use? Is there a possibility that the allotment will result in inequitable distribution or usurpation of land and available resources? (c) Are proper allotments, such as water rights allotment in the project area made? Is there a possibility that the allotments will result in inequitable distribution or usurpation of water rights and available resources? (d) Is there a possibility that the amount of water used (surface water, groundwater) by the project will adversely affect the downstream fisheries and water uses? (e) Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? Is adequate consideration given to public health education, if necessary?	(a) N (b)Y (c)Y (d)N (e)N	(a) The project has been designed and prioritized based on the consultations with the local communities, and will among others improve their livelihoods and resilience to the adverse effects of climate change. (b) The community donated the land where the project shall be undertaken. Additionally, all relevant procedures were followed for the allotment of the project site.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) The project location is not within any local archaeological site
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) Although the project is likely to change the local landscape through the introduction of a new feature courtesy of the project, the activity will not adversely affect the landscape features and structures.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) Y (b) Y	(a) Adequate consultations were undertaken, considerations of the likely impacts of project on the cultures and minorities taken into consideration. (b) All communities and clans around the project site have been adequately involved in the project planning, discussions and consultations.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) N (b) Y (c) Y (d) Y	(a) No laws and regulations have been violated by the project. Indeed the project is a priority under the Kenya's economic blueprint - the Vision 2030. (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities (d) Contractor to take this aspect into consideration during the project activities

<b>5 Others</b>	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) Y (b) Y (c) Y	(a) Contractor to take this aspect into consideration during the project activities (b) Contractor to take this aspect into consideration during the project activities (c) Contractor to take this aspect into consideration during the project activities
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) N (c) N (d) Y	(a)TBA (b)TBA (c)TBA (d) TBA
<b>6 Note</b>	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry checklist should also be checked. (b) For the projects including construction of large-scale weirs, reservoirs, and dams, where necessary, pertinent items described in the Hydropower, Dams and Reservoirs checklist should also be checked.	(a)N (b) N	(a)N/A (b) N/A
	Note on Using Environmental Checklist	(a) If necessary, the impacts to trans-boundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as trans-boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) N	(a) The project location is not within a trans-boundary
<p>1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).</p> <p>2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.</p>				

# *Attachment D5*

*Reference material on Accounting and  
Record Keeping for Water Users  
Associations*

**Reference material**  
**on**  
**Accounting and Record Keeping**  
**For**  
**Water Users Associations**

~ Fee collection for borehole water supply~

~ Contents ~

- 1. Registration / Monthly Contribution**
- 2. Receipts / Payment Voucher**
- 3. Cash Book**
- 4. Water Fee Collection**
- 5. Revenue Analysis and Budgeting**
- 6. Accountability**

## Registration / Monthly Contribution

### Annual registration/monthly contribution record

Annual registration fee or monthly fee should be recorded record on the registration book and the revenue should be recorded in the cashbook.

The following is the example of the book to keep annual registration fee collection / monthly fee correction.



Sr.No.	Name of the Member	2012	2013	2014
1	<i>Katelo Umuro</i>	300	300	
2	<i>Atho Tura</i>	300	300	
3	<i>Malicha Duda</i>	300		
4	<i>Gisoya Wario</i>		300	
5	<i>Buke Adano</i>	300	300	
6	<i>Shuke Omare</i>	300	300	
7	<i>Boru Denge</i>	300	300	
8	<i>Jillo Duke</i>	300		
9	<i>Sororo Woto</i>		300	
10	<i>Dima Umuro</i>	300	300	
11	<i>Talasso Adele</i>	300		
12				
	Total	2700	2400	

Make one column for every year. Or every month if fees are collected monthly

Annual registration fee/ monthly fee collected from the each member

Total amount collected in this month. Enter the amount in the cashbook as income

This can be applied to the monthly contribution if they have the system of monthly contribution

## Receipts / Payment Voucher


### Preparation of Receipt / Payment Voucher

When to prepare and issue receipt / Payment Voucher

Receipt:	When the WUA receives any payment (to be issued to the payer)
Payment Voucher:	When the WUA made payment to a individual who does not have receipt to be issued (to be keep for WUA payment record)

1. When the WUA receive some payment (to give to the payer and *keep a carbon copy with treasure*)

### RECEIPT

<b>NAME</b> <u>Shurr WUA</u>	<b>Date</b> <u>20. 06 . 2013</u>
<b>Received From</b> <u>Adano Galgallo</u>	
<b>The Sum of Shillings</b> <u>Three Hundred only</u>	
<b>being payment of</b> <u>Annual membership fee</u>	
<b>Shs.</b> <u>300 /=</u>	

Name of the Payer

Amount paid

Purpose of the payment

Signature of the WUA (Treasurer)

2. When the WUA make payment to an individual who does not have a receipt to be issued

### Payment Voucher

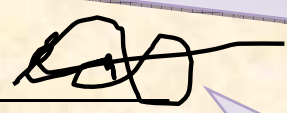
To Shurr Water Users Association

**Date** 13. 06 . 2013

Duly received a sum of  
Five Hundred Shillings (KSH 500 /= )

for being payment of Operator salary for June

Authorized by Katelo Guyo

Received by Denge Moga 

Authorized by the WUA Official (e.g. Chairman)

Signature of the person who receive the payment

## Cash Book

Cash record should be always compatible with cash in hand and the proof documents (receipts, registration resocrd, bank deposit slip etc) of incoming and outgoing.

Record all the transaction of cash and paste the proof documents on a sheet of paper and file the paper with the receipt in a 'Receipt File'. Balance cash in the record should be confirmed with the cash in hand.



## Cash ledger

Purpose of expense or source of cash received

Amount of cash received

Amount of cash spent

Date	Particular	Receipt No.	Debit/Incoming	Credit/Outgoing	Balance
2013/5/13	Collection of registration fee		60,600		60,600
2013/5/17	Purchasing fuel	1		20,000	40,600
2013/5/19	Bank deposit	2		30,000	10,600
2013/5/20	Fee collection		35,000		45,600
2013/5/30	Withdrawal from bank		20,000		65,600

Bank withdrawal should be entered as incoming in the cash ledger and as outgoing in the bank book ledger

Bank withdrawal should be entered as incoming in the cash ledger and as outgoing in the bank book ledger

Check the balance with the cash in hand

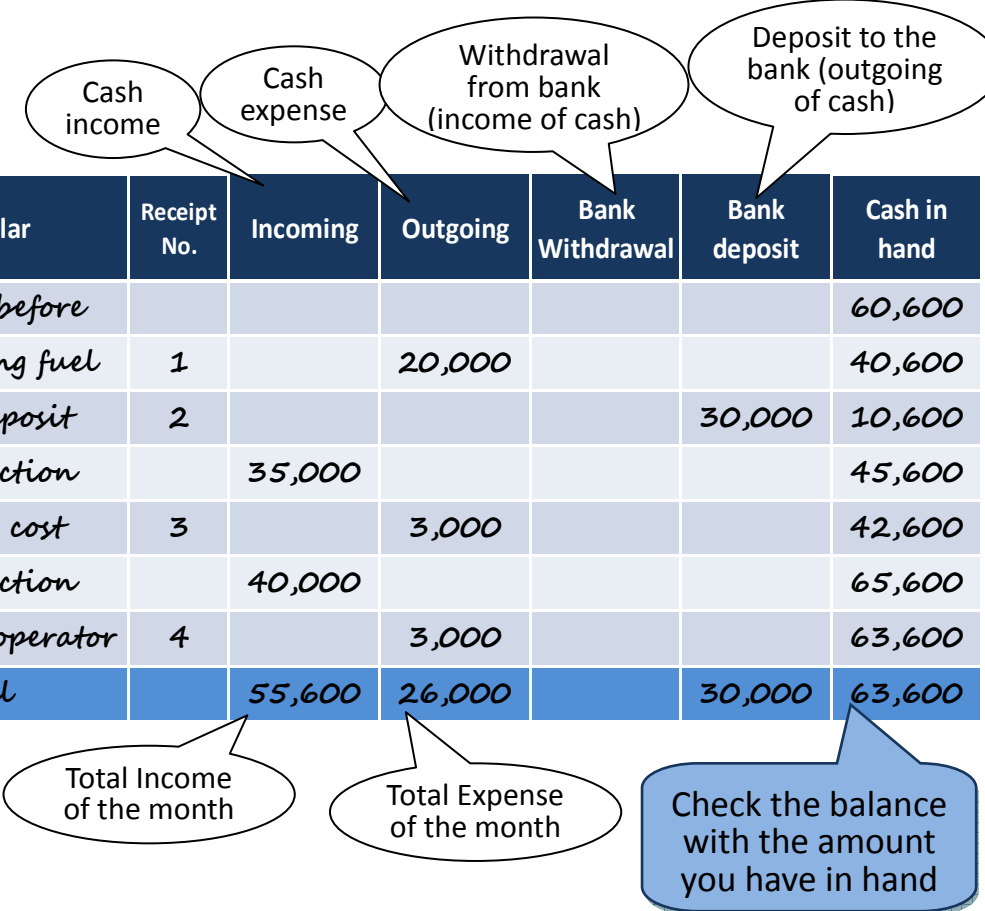
## Bank book ledger

Date	Particular	Receipt No.	Debit/Incoming	Credit/Outgoing	Balance
2013/5/19	Deposit to Bank		30,000		30,000
2013/5/30	withdrawal			20,000	10,000

The following ledger is another example, with which you can easily confirm monthly income, monthly expense by entreing bank transaction separately.

### Example of cash ledger with bank transaction

Date	Particular	Receipt No.	Incoming	Outgoing	Bank Withdrawal	Bank deposit	Cash in hand
2013/5/1	Balance before						60,600
2013/5/7	Purchasing fuel	1		20,000			40,600
2013/5/9	Bank deposit	2				30,000	10,600
2013/5/20	Fee collection		35,000				45,600
2013/5/23	repaing cost	3		3,000			42,600
2013/5/27	Fee collection		40,000				65,600
2013/5/29	Salary for operator	4		3,000			63,600
	<b>Total</b>		<b>55,600</b>	<b>26,000</b>		<b>30,000</b>	<b>63,600</b>



### How to Keep Receipts



## Let's Exercise !!

### Example of transaction

1. There is a balance from the last month(June) of Ksh.32,500
2. Water fee of Ksh.11,000 was collected at the kiosks on 5<sup>th</sup> July 2013
3. purchased oil for generator on 13<sup>th</sup> July 2013 with cost of Ksh.1500
4. Ksh.30,000 was deposited in the bank on 20<sup>th</sup> July 2013
5. Withdrawn cash of Ksh.10,000 from the bank and purchased fuel for Ksh.10,000 on 30<sup>th</sup> July 2013



A sample answer:

### Cash ledger

Date	Particular	Receipt No.	Incoming	Outgoing	balance
1/7/2013	Balance from last month		32,500	-	32,500
5/7/2013	Fee collection at kiosk		11,000	-	43,500
13/7/2013	Oil for generator	1	-	1,500	42,000
20/7/2013	Bank deposit	2	-	30,000	12,000
30/7/2013	Bank withdrawal		10,000-	-	22,000
30/7/2013	Fuel	3	-	10,000	12,000

Withdrawal should be entered as bank withdrawal and fuel cost should be separately entered as expense

Bank deposit should be deducted as you will not have the cash deposited in your hand

### Bank ledger

Date	Particular	Receipt /cheque	Incoming	Outgoing	balance
20/7/2013	Bank deposit		30,000	-	30,000
30/7/2013	Withdrawal of cash		-	10,000	20,000

## Water fee collection

### 1. Recording monthly payment system

Fee collection							
Monthly Fee collection							
Name	Camel	Shoats	Cattle	Donkey	July	August	September
	Ksh 50/=	Ksh 10/=	Ksh 60/=	Ksh 40/=			
<i>Katelo Umuro</i>	30	100	10	5	3,300	3,300	3,300
<i>Atho Tura</i>	20	50	-	2	1,580		1,580
<i>Malicha Duda</i>	40	80	-	4	2,960	2,960	
<i>Gisoya Wario</i>	10	30	-	2	880	880	880
<i>Buke Adano</i>	70	200	20	5	6,900	6,900	6,900
<i>Shuke Omare</i>	50	120	-	4	3,860	3,860	
<i>Boru Denge</i>	10	25	-	2	830	830	830
<i>Jillo Duke</i>	20	50	10	5	2,300	2,300	2,300
<i>Sororo Woto</i>	80	180	30	6	7,840	7,840	7,840
<i>Dima Umuro</i>	50	90	-	3		3,520	3,520
<i>Talasso Adele</i>	10	40	-	2		980	980
<b>Total</b>					<b>30450</b>	<b>33370</b>	<b>28130</b>

Monthly fee per animal per head

The number of animals each member owns

Total Monthly fees paid in each month

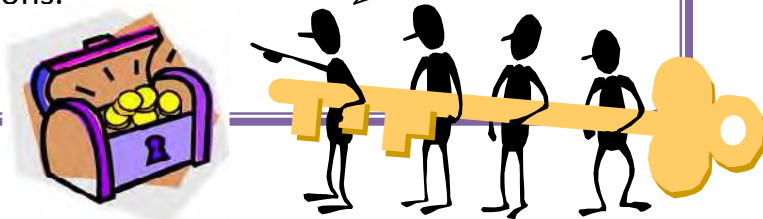
Entre in the Ledger as income

This can be applied to the recording of fixed amount with declared number of jerry cans par day for domestic use

#### Keep the cash in a safe place!!!

Prepare a box with 2-3 padlocks and keys should be kept by different responsible persons.

Let us open together



## 2. Recording collection per jerry can at the water kiosk

The following sheet should be kept and recorded by the operator and reported to the treasurer when handing over the collected fee

This means water fee per litre is Ksh.0.1

[Water consumption] × Ksh.0.1

**Fee collection**

Water Kiosk

Monthly Fee: **KSH 2/= per Jerry can of 20litre**

Date	Total Fee collected (Ksh)	Water meter reading		Water consumption	Expected amount to be collected	Difference of expected and actual
		Start	End			
30/06/2013	2530	289467	315067	25600	2560	30
01/07/2013	1970	315067	337067	22000	2200	230
02/07/2013	2360	337067	363467	26400	2640	280
03/07/2013	2022	363467	384869	21402	2140	118
04/07/2013	2790	384869	413027	28158	2816	26
05/07/2013	3078	413027	444277	31250	3125	47
06/07/2013	2380	444277	479350	35073	3507	1127
07/07/2013	2630	479350	507400	28050	2805	175

Total collected fee of the day

Meter reading [end] – [start]



Check the trend of Difference between expected amount and the actual fee collected.  
If this is irregular, something is wrong!!

If the daily calculation is difficult, weekly recording and calculation is still acceptable as long as you can read the meter and the 'fee per litre' is compatible with the expected fee per litre.

## Collection from different water points

Example

Fee collection Record

Date	Collection sites	Total Fee collected (Ksh)	Water meter reading		Water consumption	Signature
			Start	End		
28-30/6/2013	Town Kiosk	720	89467	96067	6600	<i>[Signature]</i>
1-5/7/2013	Nebei village	1970	187043	207598	20555	<i>[Signature]</i>
2-5/7/2013	Gobore	4082	362781	407982	45201	<i>[Signature]</i>
1-6/7/2013	Town Kiosk	1280	96067	109123	13056	<i>[Signature]</i>
6-8/7/2013	Gobore	2790	109123	139813	30690	<i>[Signature]</i>
6-9/07/2013	Nebei village	1530	139813	155878	16065	<i>[Signature]</i>

**Tip** for calculation of expected amount of fee to be collected

e.g. If the average water fee is **Ksh 2/= per 20litre jerry can**

Water consumption				Expected fee collected
<b>12.000m<sup>3</sup></b>	→	<b>12.000</b>	→	<b>Ksh1200</b>
<b>8.523m<sup>3</sup></b>	→	<b>8.523</b>	→	<b>Ksh852</b>

*Just remove the last number!!*

Example:



1.238m<sup>3</sup>



31.132m<sup>3</sup>

$$31.132 - 1.238 = 29.894\text{m}^3 \rightarrow 29894 \rightarrow \text{Ksh2989}$$

**Expected amount to be collected**

# Revenue analysis and Budgeting

## 1. Revenue analysis

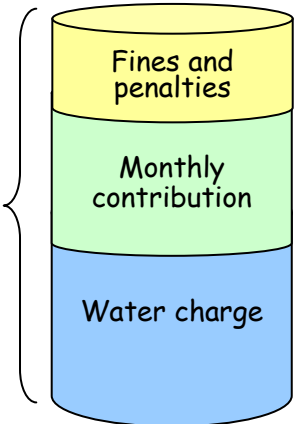
How much can we expect as revenue of the WUA??

List source of revenue

Examples of sources of revenue;

1. Membership fee and monthly contribution
2. Water fee collection
3. Irregular income such as fines and penalties

Expected Revenue



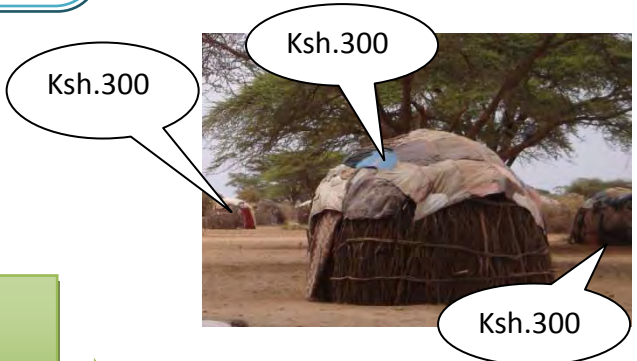
Calculation of monthly revenue

### 1. Membership fee and monthly contribution

Membership fee: Ksh.300 / household / year  
 →  $Ksh.300 \times 100 \text{ members} = Ksh.30,000$   
 →  $Ksh.30,000 / 12 \text{ month} = Ksh.2,500$

Monthly Contribution : Ksh.100 / member / month  
 →  $Ksh.100 \times 100 \text{ members} = Ksh.10,000$

Sub-total  
 $Ksh.2,500 + Ksh.10,000$   
 = Ksh.12,500



### 2. Water fee collection

e.g. Domestic Use : payment per fixed rate per month

Please put money in the box




Ksh.200 for user up to 4 jerry cans per day, 70 members paid for this  
 Ksh.400 for user up to 8 jerry cans per day, 30 members paid for this

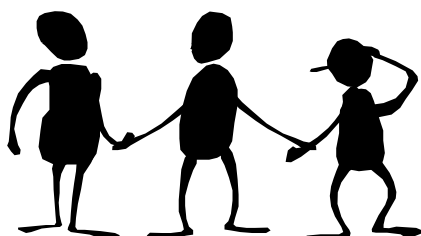
$Ksh.200 \times 70 + Ksh.400 \times 30$   
 =  $Ksh.14,000 + Ksh.12,000$   
 = Ksh.26,000



e.g. Domestic Use : payment per jerry can and  
Livestock : payment per use

 Read the record of the past 6 months and calculate the average

Source	Rain Season (less animal use)			Dry Season (more animal use)			Total	Average
	April	May	June	July	August	Sept		
Domestic	25,000	26,000	26,000	24,000	25,000	27,000	153,000	25,500
Camel	1,000	2,000	1,000	43,000	53,000	49,000	149,000	24,833
Shorts	2,000	2,500	2,500	70,000	78,000	82,000	237,000	39,500
Cattles	0	1,000	1,000	4,000	7,000	8,000	21,000	3,500
Total							560,000	<b>93,333</b>



Average income per month

## 2. Operational cost analysis

They will need to consider the following categories;

### 1. Daily constant operational cost

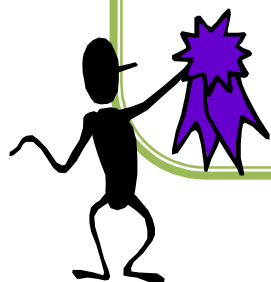
- Generator fuel cost
- Payment for operator, field clerk, guards (daily or monthly payment)

### 2. Maintenance and repairing cost

- Generator maintenance cost (oil, cleaning)
- Cost for minor repair of machinery and structures
- Saving for major repair (fix amount to be saved and accumulated every month)

### 3. Other administrative cost

- Stationary for management and operation
- Transportation cost (e.g. for procurement of fuel)
- Allowance for the workers or committee (if any)
- Saving for miscellaneous expenses (government fee etc.) (save a fixed amount every month)



How much do they cost per month??

Example:

<i>Necessary cost</i>	<i>Expenditure condition</i>	<i>Cost calculation</i>	<i>Cost per month</i>
<b>◆ Constant operational cost</b>			
<b>Generator fuel cost (use at night / cloudy day)</b>	Average hours of use per day : 1h Consumption of fuel per hour : 5litre / hour	$1h \times 30days \times 5litre \times Ksh.120 = Ksh.18,000$	Ksh.18,000
<b>Payment for operator, field clerk, guards</b>	Operator: Ksh.3,000/month, 1person Field Clerk: Ksh.2,000/month, 2persons Guards Ksh.2,000/month, 2persons	Ksh.3,000×1 = Ksh.3,000 Ksh.2,000×2 = Ksh.4,000 Ksh.2,000×2 = Ksh.4,000	Ksh.11,000
<b>◆ Maintenance and repairing cost</b>			
<b>Generator maintenance cost (oil, cleaning)</b>	Oil: 10litre/month, Ksh.350/litre Oil filter: Ksh.1,500, once in 3month Air filter: Ksh.1,500, once in 3month	Ksh.350×10 = Ksh.3,500 Ksh.1,500/3 = Ksh.500 Ksh.1,500/3 = Ksh.500	Ksh.4,500
<b>Cost for minor repair of machinery</b>	Ksh.12,000, once in 4month	$Ksh.12,000/4 = Ksh.3,000$	Ksh.3,000
<b>Saving for major repair</b>	Ksh.5,000 per month	Ksh.5,000	Ksh.5,000
<b>◆ Administrative cost</b>			
<b>Stationary</b>	Ksh.1,000 per month	Ksh.1,000	Ksh.1,000
<b>Transportation</b>	Ksh.5,000 to/from Marsabit, once in 2month	$Ksh.5,000/2 = Ksh.2,500$	Ksh.2,500
<b>Allowance for works</b>	Ksh.300/day, 10 day/person	$Ksh.300 \times 10 = Ksh.3,000$	Ksh.3,000
<b>Saving for emergency</b>	Ksh.1,000 per month	Ksh.1,000	Ksh.1,000
<b>Total per month</b>			<b>Ksh.52,000</b>



This savings can contribute to the repair or replacement of solar in future

# Accountability with Reporting

## Importance of accountability



Accountability of the financial transaction is very important to keep reliable accounting and reputation of the organisation. It is better to appoint a treasurer to handle cash and keep records and some other responsible persons to check the account time to time. It is not just to avoid misuse but also to correct innocent mistake.

As the WUA is a community organisation representing the community, the WUA officials have responsibility to explain the financial situation to the community.

## Preparation for reporting to the members

Records to be reported

1. Income (regular fee collection, water fee collection against water use)
2. Expenditure (amount and purpose)

### 1. Reporting the Water fee collection against water use

- Calculate total fee collected from the water use and water consumption of the whole month

Monthly Report						
Water charge						
Year 2013						
Month	Total Fee collected (Ksh)	Master meter reading		Water consumption	Expected amount to be collected	Difference of expected and actual
		Start	End			
June	50480	289467	815067	525600	52560	2080
July	57200	815067	1392067	577000	57700	500
August	87040	1392067	2293467	901400	90140	3100
September	92100	2293467	3784869	1491402	149140	57040
October	100620	3784869	4813027	1028158	102816	2196?

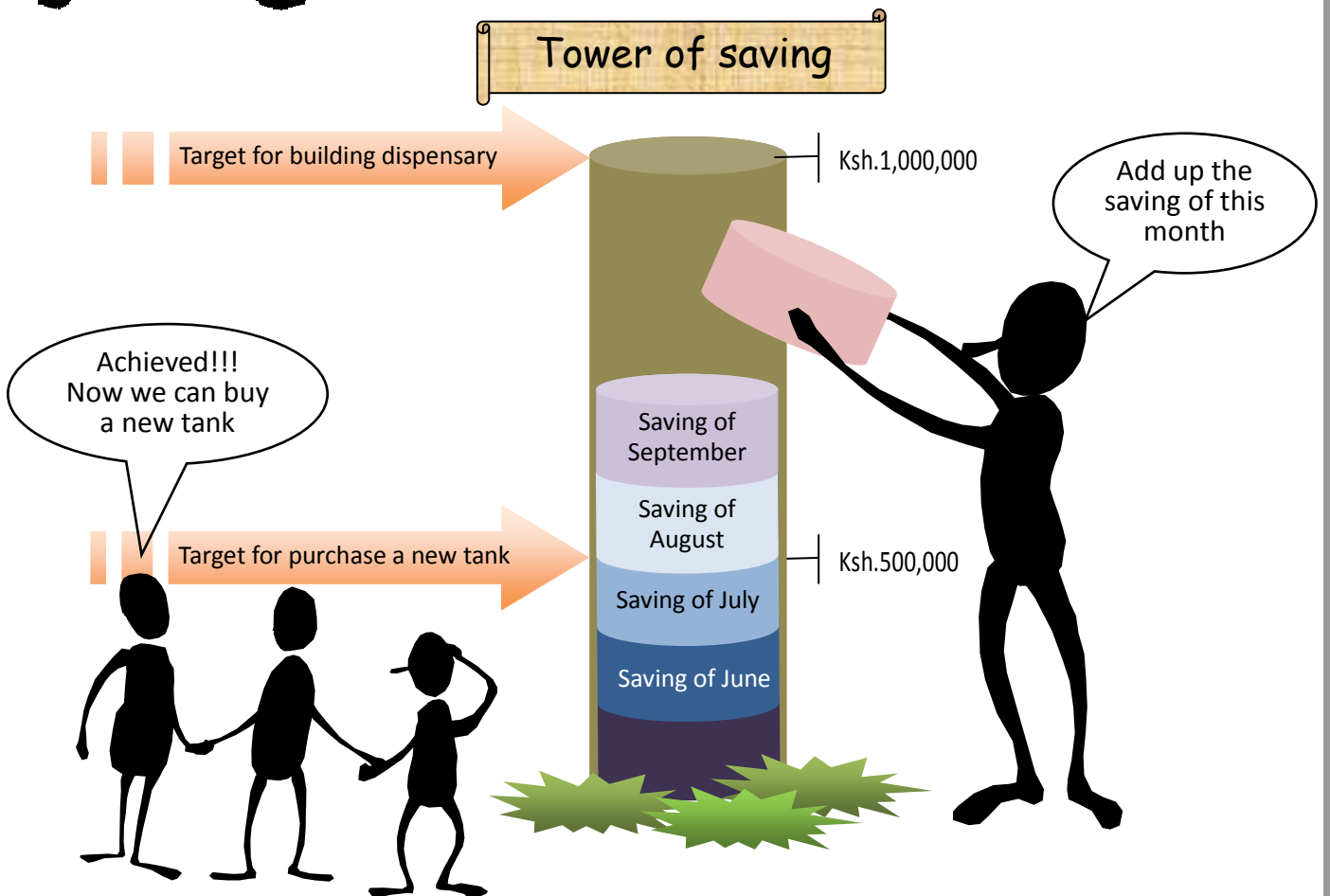
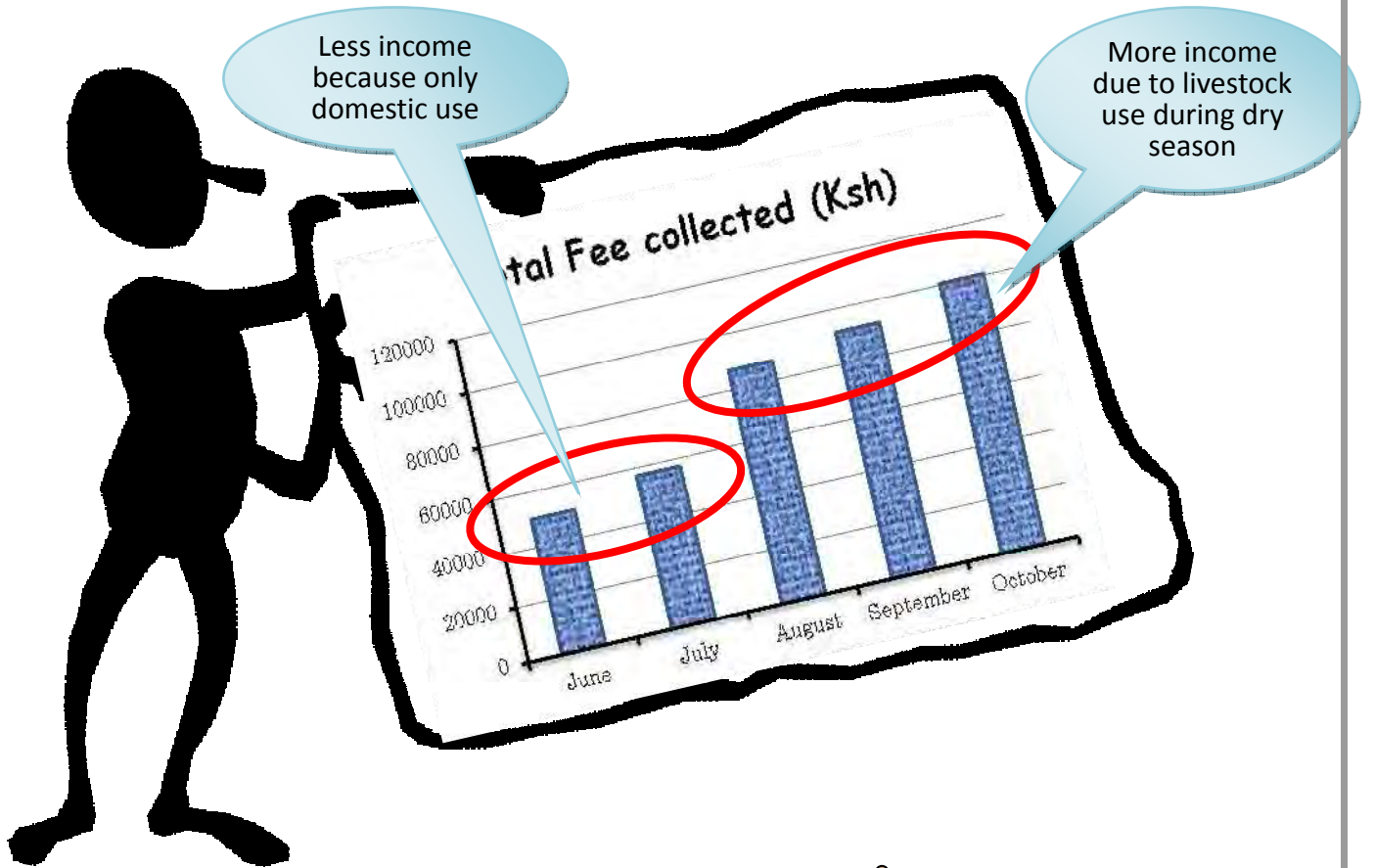
Compare the expected amount and the actual fee collected. If the difference is big, something is wrong...

Something wrong in September





Let's describe monthly trend of the fee collection in bar chart or any other visual forms for people to understand better and explain if there is irregularity.



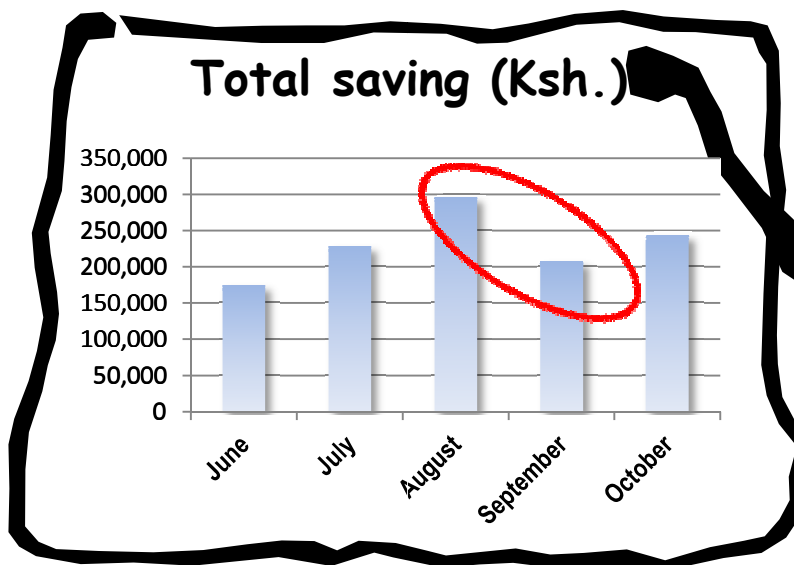
2. Report on income, expenditure and total saving

Date	Particular	Receipt No.	Incoming	Outgoing	Cash balance
2013/5/1	Balance before				60,600
2013/5/7	Purchasing fuel	1		20,000	40,600
2013/5/9	Bank deposit	2			10,600
2013/5/20	Fee collection		35,000		45,600
2013/5/23	repaing cost	3		3,000	42,600
2013/5/27	Fee collection		40,000		65,600
2013/5/29	Salary for operator	4		3,000	63,600
	<b>Total</b>		<b>55,600</b>	<b>26,000</b>	<b>63,600</b>

Monthly Report

Total saving at the end of each month

Month	Balance of the previous month	Income	Expense	Balance
June	152,500	56,000	34,000	174,500
July	174,500	82,500	28,900	228,100
August	228,100	91,000	22,930	296,170
September	296,170	87,060	176,050	207,180
October	207,180	55,600	26,000	236,780



Saving reduced in September because we repaired the tank as we agreed,,, spent Ksh100,000

Explain the reason why it reduced...  
e.g. major repair of the gen set, execution of the development activity (e.g. extension of pipe)

# *Attachment D6*

*Training Module for  
Borehole and Resource Management Training*

# **Borehole and Resource management training**

## **In Turkana County**

by JICA ECoRAD Project

July 2014



Source: ECoRAD project

### **Training objective:**

Newly established boreholes make water available to nearby communities as well as pastoralists. However, it can cause negative effects on environment as well as the nearby community if it cannot be managed properly.

The training aims at equipping the community with adequate recognition of environmental management in the broad meaning, and with proper information and knowledge for sustainable use of the borehole system for the benefit of wider community.

### **Training target:**

- WUA (or a committee selected to be responsible for the management of the borehole) members (2 members) from each newly established boreholes that have been registered under the O&M scheme of Diocese of Lodwar.
- DC representative (1 member) of the 11 target sub-locations with established boreholes.

### **Facilitation:**

- JICA ECoRAD team
- Diocese of Lodwar
- NDMA

## Timetable

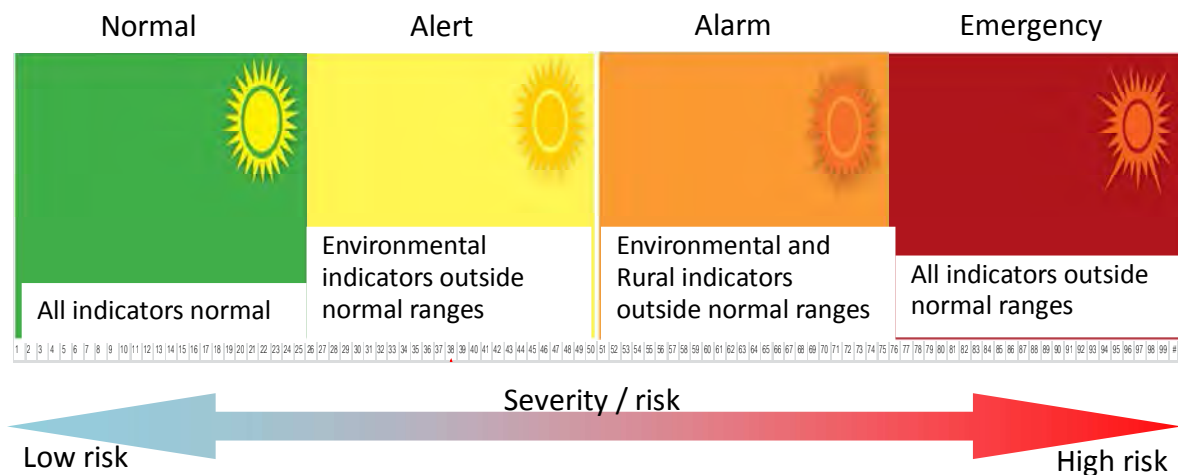
<u>Time</u>	<u>Topic</u>	<u>Contents</u>	<u>Facilitator</u>
DAY 1			
9:00 – 9:15	Registration and opening		ECoRAD
9:15 – 9:30	Introduction	Objective and outline of the training	ECoRAD
9:30 – 10:15	Early Warning System	Brief review of EWS and activities to be done in each stages	Grace, participants from DCs, (NDMA??)
10:15 – 11:30	Impact analysis of newly established borehole	Assessment of possible impact of the borehole	Vicky
11:30 – 11:45	Tea break		
11:45 – 12:45	Water and sanitation	Lecture and discussion on sanitation and water related disease focusing on borehole management	Diocese
12:45 – 13:45	Lunch break		
13:45 – 14:45	Technical maintenance of hand pumps	<ul style="list-style-type: none"> <li>▪ Preferable use of the system</li> <li>▪ Daily care to avoid problems</li> <li>▪ Identification of problems</li> <li>▪ Process to take in case of problems</li> </ul>	Diocese
14:45 – 15:00	Tea break		
15:00 – 17:00	Practical of hand pump maintenance	Demonstration and practice of the hand pump maintenance by participants	Diocese
DAY 2			
9:00 – 9:30	Recap of Day1	General review of Day1	Grace
9:30 – 11:00	Rangeland management	Importance of rangeland management in relation with newly established borehole	Hosea,
11:00 – 11:15	Tea break		
11:15 – 11:45	Review of the Impact analysis	Remind the possible impact of the borehole discussed in Day 1 to come up with the necessary management in the following session	Vicky
11:45 – 12:45	How can we manage borehole and resource?	Who to be responsible? Organisation of ourselves to manage? Rules to be agreed and followed?	Vicky
12:45 – 13:30	Way forward	Roles of the management committee / responsible person Sharing with the community to make consensus on the management	Grace
13:30 – 14:30	Lunch and Closing		

## Training contents:

### 1. Early Warning System

Brief review of the EWS (stages of EWS and activities to be done in each stage)

\*Involve the participants from the development committees to explain to other participants with help of facilitator.

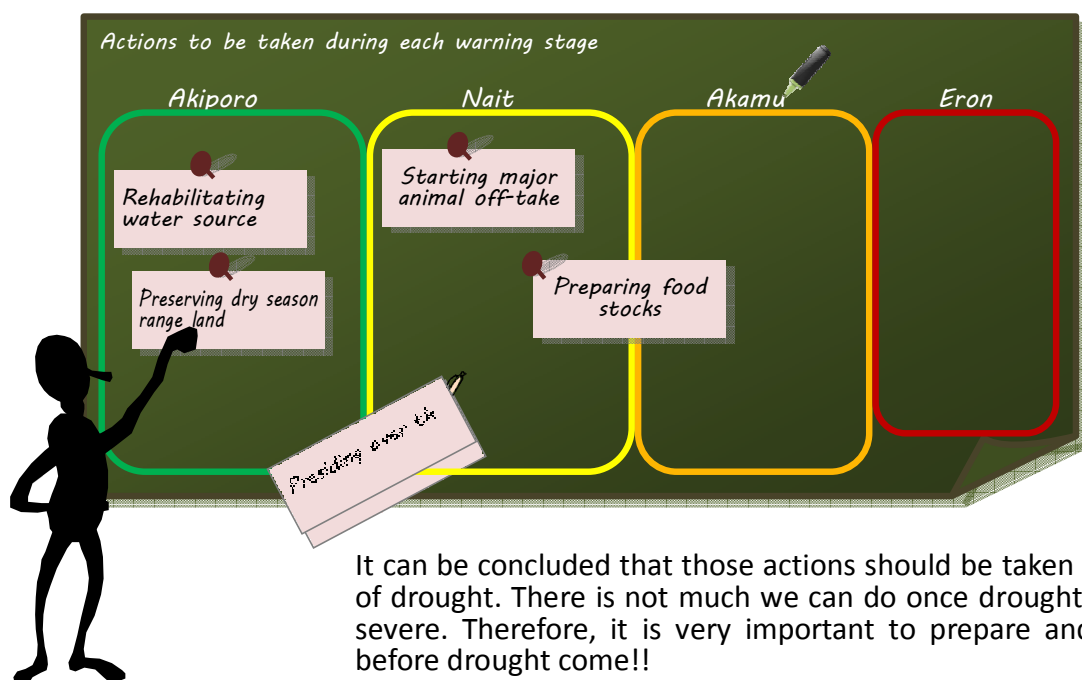


Actions to be taken in each stage of drought

Example of actions ;

- Livestock market
- Water management and assuring function of the water source
- De-silting of water pans and rehabilitation of other water sources
- Pasture management, rangeland management
- Natural resource sharing negotiations
- Mainstreamed conflict mitigation aimed at increasing access to vital resources
- Provide training ranging from business management to animal health
- Implementation of new projects

When those actions should be taken???



## 2. Impact analysis of newly established borehole

### 2.1. Possible change in environment/situation of the area due to established borehole

Open discussion on what kind of situation and change can be expected due to new borehole both positive and negative

e.g.

#### **Positive impact**

- Water is available during dry season
- Pasture that were wasted before due to lack of water source around can be consumed during dry season
- Improving plant species (raised grazing system by controlling shrub growth and dispersing seeds through animal hoots and manure, and trampling can stimulate grass tilling and improve seed germination)
- Provide opportunities for improving health and productivity



Source: canucks.nhl.com



Source: practicalaction.org



Source: eleosproject.wordpress.com

#### **Negative impacts**

- Congestion of people and livestock who come for watering
- Some people may settle around the BH and
- Overcrowding of livestock can cause overgrazing around the borehole site
- Overgrazing can cause soil erosion, and decreased soil fertility that results in poor productivity
- It can cause conflicts and fights among people especially around the borehole which different community of people use
- Some people may misuse the water
- Some people may make damage and breakage on the pump system
- Crowds of people and livestock can cause hygiene and sanitation problem around the BH



Source: csdi-international.org



Source: livinginturkana.blogspot.com

Based on the expected situation discussed in this session, the participants are expected to discuss how they can manage to maximise the positive impacts and to avoid negative impacts in the 2<sup>nd</sup>-day session.

### 3. Water and Sanitation<sup>1</sup>

#### IMPORTANCE OF WATER/USES OF WATER

- Domestic use e.g. for cooking, cleaning and all sorts of domestic cleaning.
- For livestock
- Hospital use e.g. for medication, drips etc.
- Industrial use.
- For Irrigation purposes.
- For building and construction.

#### WHY IS WATER FROM A HAND-PUMP BETTER THAN WATER FROM OTHER SOURCES?

The deep-well hand-pumps is one of the safest source of clean and potable water. Water from streams, open wells and tanks usually carries disease. But the tube well is sealed so that harmful germs cannot enter it. It's a protected source of water.

If people want to stay healthy, they must have been drinking clean water always. If they drink even a sip of water which is not clean, they can get ill.

Therefore, it is important to know what clean water is and how we can make water safe enough for human consumption.

#### GENERAL WAYS OF PROTECTING WATER CONTAMINATION

- Human faeces should not be near water source and urinating shouldn't be done near a water source.
- Leaves from trees which are cut down near a water source shouldn't be left lying there and roots from some trees make water have a certain smell.
- Pit latrines should not be constructed near a water sources and should be covered to avoid the transmission of diseases.
- Food should be well cooked to kill germs and flies should be kept away from our homes by keeping our surrounding clean.
- Water should be boiled to kill germs before it's used for drinking and stagnant water near water sources should be drained off to avoid contaminating underground water.

#### METHODS OF WATER PURIFICATION

1. Decantation.
2. Filtration: e.g. clean piece of cloth, a sieve, a filter (candle filter).
3. Sterilization : e.g. boiling, chlorination, distillation.

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<sup>1</sup> Prepared by Diocese of Lodwar with minor modification



## WATER –RELATED DISEASES

1. *Water borne diseases*

Typhoid, Cholera, Polio, Myelitia, Amoibiasis, Hepatitis, TRACHOMA

2. *Air borne diseases*

T.B, Measles, Common cold, Whooping cough, Influenza, Small pox, Rubella, Mumps

3. *Faecal contamination through 4fs*

Food, Flies, Fingers, Faeces;- Typhoid, Fever, Cholera, Dysentery, Amoeba

4. *Helminthes/worms diseases*

e.g. hookworms, tapeworms, round worms.

5. *Vermin's and rodents disease*

e.g. yellow fever, malaria, sleeping sickness, bilharzias, plague.

6. *Contact (STDS) diseases.*

Gonorrhea, Syphilis, Chanacroid, Rabies, Tetanus

#### 4. Technical Maintenance of Borehole and hand pumps<sup>2</sup>

##### 4.1. Basics of Indian Mark-II Hand pump



*Source: ACF Uganda Mission (2010) 'Installation and maintenance manual for Hand pump technicians and borehole caretakers'*

India Mark II was made from India and its parts are galvanized and the pump rods are steel even the cylinder is galvanized. The pump uses 1 ¼ main rising GI. It can pump water from 60meters and it uses rubber caps for pumping water. The pump is not simple like Afridev' pump. It needs the Tripod to remove the rising main and pump rods during mechanical breakdown.

#### FOUR IMPORTANT THINGS ABOUT HAND-PUMP.

1. Deep-well hand pump water is better than water from other sources. Water from ponds, rivers and tanks can contain disease carrying germs. If we drink this water, we can get ill. But the water from a hand- pump is protected from disease. So if we drink water from a hand –pump, we will stay healthy.
2. People must use hand-pump properly.
3. People must maintain hand-pumps properly.
4. The villagers must contact the appropriate people if the hand-pump break down.

<sup>2</sup> Prepared by Diocese of Lodwar with minor modification with reference of 'Indian Mark II installation and maintenance manual' Ajay Industrial Corporation Limited

## The Hand Pump Detailed Assembly

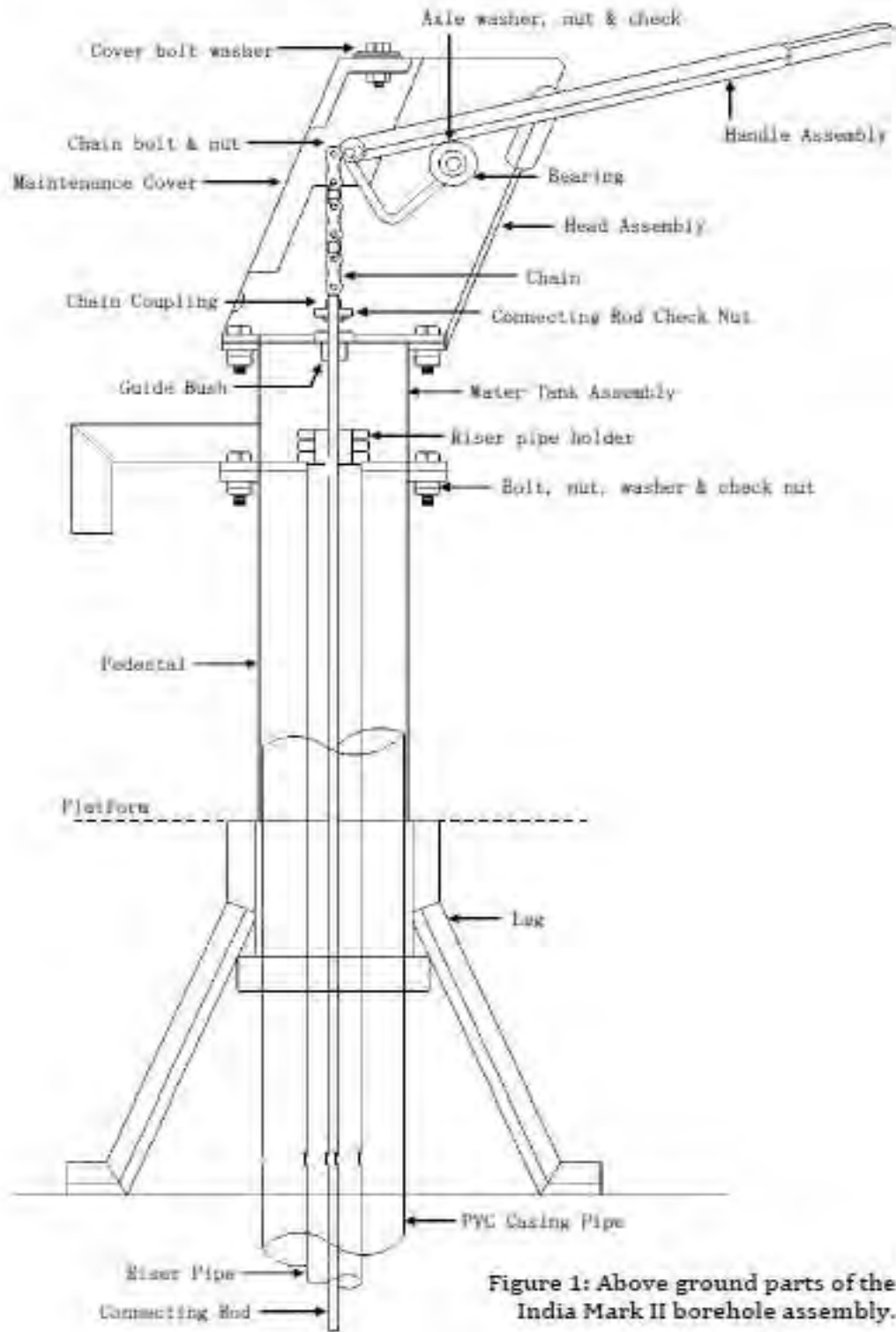


Figure 1: Above ground parts of the India Mark II borehole assembly.

Source: ACF Uganda Mission (2010) 'Installation and maintenance manual for Hand pump technicians and borehole caretakers'

### Below Ground Pump Cylinder

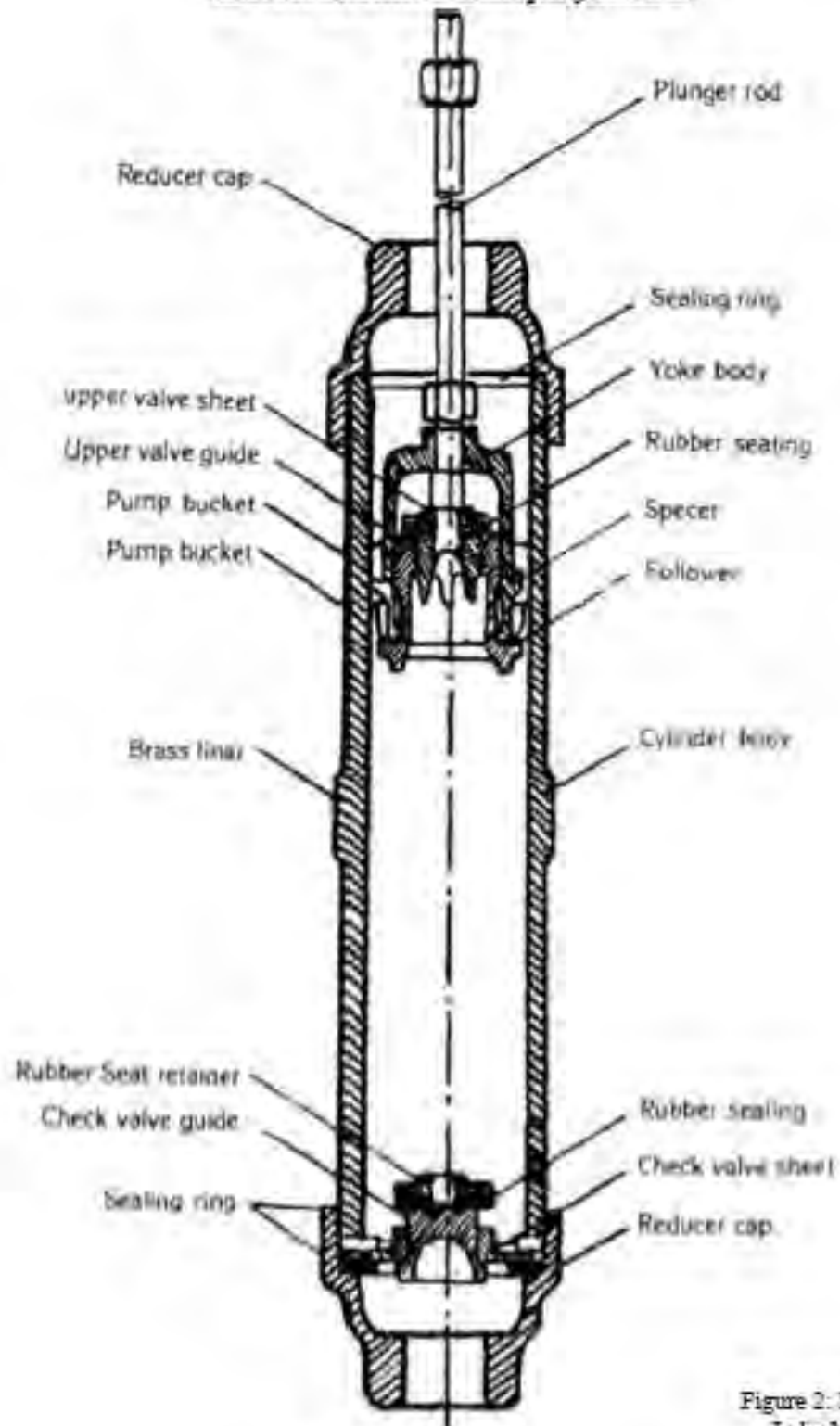


Figure 2: Pump cylinder for the India Mark II

Source: ACF Uganda Mission (2010) 'Installation and maintenance manual for Hand pump technicians and borehole caretakers'

#### 4.2. Adequate use of the hand pump

- Proper way of handling the Indian mark two India mark II Deep well hand-pump is made of very strong materials and it seldom breaks down, it still require care and periodical maintenance to use it for longer period with better performance.

##### “DO’s” and “DON’Ts” for Using Hand-pump

“DO’s”	“DON’Ts”
1. Do use the pump gently	1. Don’t use the hand pump roughly
2. Do pump the handle with Long, Slow strokes.	2. Don’t pump the handle short, quick strokes.

#### 4.3. Daily care and maintenance of the hand pump

##### **How boreholes can be maintained:**

Ideally, a well is regularly checked and maintained by a trained pump mechanic whose duties are to make sure major breakdowns do not occur, which could severely interrupt service. This includes preventative maintenance to ensure a long life for the borehole.

##### **A typical schedule of maintenance could involve the following:**

###### **Daily**

- ✓ Monitor pump operation and grease pump parts where necessary
- ✓ Check for all loose nuts and tighten them when necessary
- ✓ Avoid banging the borehole with the handle when pumping water
- ✓ Fix any broken fencing (to keep animals out) and ensure that water point is clean

###### **Weekly**

- ✓ Lubricate all joints and moving parts of the borehole
- ✓ Check and tighten all nuts and bolts
- ✓ Check security of pump on pedestal

###### **Monthly**

- ✓ Check output rate
- ✓ Check for condition of concrete apron

###### **Yearly**

- ✓ Remove the pump cylinder and pipes from the well, inspect, replace any worn out parts.

“DO’S” AND “DON’TS “ FOR MAINTAINING HAND-PUMPS.

DO’S	DON’TS
1. Do sweep the platform(CATTLE TOUGH AND PLINTH) regularly	1. Don’t let the platform(CATTLE TOUGH AND PLINTH) get dirty
2. Do keep the area around the platform(CATTLE TOUGH AND PLINTH) dry	2. Don’t let water collect around the platform(CATTLE TOUGH AND PLINTH)
3. Do clean the ground near the pump and keep the drain clean	3. Don’t let rubbish collect near the pump and don’t allow pit latrines compost within 100 meters of the well.
4. Do make compost far from the pump.	4. Don’t let animals near the pump and don’t defecate near the pump
5. Use waste water for vegetables, fruits, trees or other plants which can soak up the excess water.	5. Don’t let animals defecate near the pump.
	6. Don’t put Oil or any other Lubricant on the plastic bearings(Bushes)

4.4. Identification of problems

- What are common problems / expected failure of hand pump?

**How Boreholes Hand Pumps Break Down**

Hand pumps, like all mechanical assemblies tend to break down if not properly used, ne-glected, or if overused. Long-term maintenance of rural water boreholes therefore has be-come the most challenging task for governments and humanitarian aid organizations. In re-sponse to this, ACF will work with beneficiaries to educate communities on proper mainte-nance schedules for community boreholes.

**Common mechanical borehole problems include:**

- ✦ Worn out handle assembly that is no longer properly connected to the chain and con-necting rods
- ✦ Worn out bearings and bolts components in pump head assembly
- ✦ Worn out pipes and leakage of the pipes.
- ✦ Worn out sealing and rubber sealing rings
- ✦ Riser pipes become corroded and disconnected.
- ✦ Broken pedestal which can create unsanitary conditions inside the well

*Source: ACF Uganda Mission (2010) ‘Installation and maintenance manual for Hand pump technicians and borehole caretakers’*

How can the users and operators identify problem?

**These remedies should be handled by skilled technicians**

**THE TROUBLE SHOOTING TABLE FOR COMMON PROBLEMS**

S/N	SIGN/DEFECT/INDICATION	POSSIBLE CAUSE(S)	REMEDY
1	Draws rusty water	<ul style="list-style-type: none"> <li>• Pipes and the rods corrosions</li> <li>• Chemistry of water problems</li> </ul>	Free the pipes and rod from corrosion by developing/flushing the well.
2	Pumped out water containing worms	<ul style="list-style-type: none"> <li>• Damaged casing</li> <li>• Improper sanitary seal</li> <li>• Poor well design</li> </ul>	Chlorinate the well Improve on the BH design.
3	Pump weightless and no water. Then at instant of breakdown splash sound hardly.	<ul style="list-style-type: none"> <li>• Pipes/rods disconnected and dropped.</li> </ul>	Check for the pipes if the pipes are dropped then Fishing out is re-quired.
4	Pump weight is usual but no water comes	<ul style="list-style-type: none"> <li>• Reducer cap disconnected and the lower valve assembly dropped.</li> <li>• Complete cylinder dropped.</li> <li>• Cylinder yoke body disconnected</li> </ul>	Dismantle and replace the lower valve and the reducer cap. Replace the whole cylinder. Dismantle and reconnect it.
5	Pump is very light but no water comes completely	<ul style="list-style-type: none"> <li>• Disconnection of rods at the joint</li> </ul>	Re-connect the disconnected rod.
6	Water takes very long to come even after a brief stop over.	<ul style="list-style-type: none"> <li>• Worn out sealing rings or pump buckets</li> <li>• Cracks on the rising mains</li> </ul>	Replace the sealing rings and the pump buckets. Replace the damaged rising mains
7	Water only comes well during rapid pumping	<ul style="list-style-type: none"> <li>• Pipe leakages</li> <li>• Worn out sealing and rubber sealing rings</li> </ul>	Replace leaking pipes or tighten the pipes at the sockets. Replace sealing rings
8	Unusual noise when pumping	<ul style="list-style-type: none"> <li>• Lack of lubrication</li> <li>• Bearing crushing</li> <li>• Some Bolts and nuts are missing or loosen</li> <li>• Top connecting rods is bent</li> </ul>	Greasing Replace bearing Tighten the nuts or replace the miss-ing nuts. Remove and straighten the rod or replace the rod.
9	Muddy or silt water pumps out	<ul style="list-style-type: none"> <li>• Cylinder is too close to the well bot-tom</li> <li>• Insufficient filtration of inflow water by the gravel packs.</li> </ul>	Reduce the cylinder depth –depending on the yield of the well, cylinders shouldn't be installed at least 6m from the bottom of the well. Develop the well.

Source: ACF Uganda Mission (2010) 'Installation and maintenance manual for Hand pump technicians and borehole caretakers'

## **General Maintenance Guidelines**

The India Mark II deep well hand pumps are to be properly maintained to ensure safe potable drinking water to the community, without break down. Proper and regular maintenance will prevent breakdowns as seen earlier in the booklet. The moving parts in the India Mark II hand pump above and below the ground level are few and therefore simplifying the maintenance of the hand pump.

The following schedule of maintenance has been drawn at fixed intervals and has been explained more elaborately.

### **1) Once in 30 days:**

These actions are to be taken by the community.

#### **(a) Cares to be done by the community**

- (i). Tighten the handle axle nut and lock nut
- (ii). Look for loose or missing flange bolts and nuts
- (iii). Open the front of the head cover and clean inside the pump.
- (iv). Check the chain anchor bolt for proper fitment. Tighten if necessary.
- (v). Clean the chain assembly. Apply graphite grease.
- (vi). Look for rusty patches and clean them.
- (vii). Check whether the hand pump base is loose in the foundation. In case it is loose an arrangement should be made to redo the foundation.

### **2) After 365 days (1 year)**

#### **(a) Cares to be done by the community**

Examine the pump carefully and check whether:

- (i). Discharge is satisfactory
- (ii). Handle shaky and not firm
- (iii). Guide bush has excessively worn out
- (iv). All bolts, nuts and washers are in position
- (v). Chain has worn out
- (vi). Roller chain guide is excessively worn out

These should be done by skilled technicians.

#### **(b) Cares and actions to be taken by the skilled technicians**

*Overhaul the pump and follow the instructions:*

- (i). If chain, bearing spacer are damaged, replace them*
- (ii). If roller chain is badly worn out, replace the handle assembly*
- (iii). If there are any damaged pipes have them replaced*
- (iv). Open out the cylinder assembly and replace cup washers, sealing rings and other components found to be faulty*
- (v). Check the condition of the water tank riser holder. If the threads are worn out, replace water chamber*
- (vi). Check for any other seam line failures or cracks*
- (vii). Re-install the pump as in the training*



#### 4.5. Necessary action to be taken in case of problem

- What should users and operators do when they identify problems?

Some hand-pump problems are quite complicated and too technical for the community to handle by themselves.

What is necessary for the community is to identify the problem and the problem is technical, you should not try to adjust by yourself. If you try without enough technical skills and equipments, you may cause serious damage on the pump.

Call relevant and responsible institutions or government office for help when you observe technical problem, informing technicians with clear information of the problem.

- How they can arrange repair with Dioceses scheme?

As long as your borehole is registered under the O&M scheme of Diocese of Lodwar, you can ask for assistance from Diocese of Lodwar.

Contact the following people of nearby Diocese churches when you observe problems.



TURKANA WATER PROJECT STAFFS CONTACTS IN CASE OF WATER POINTS EMERGENCIES/BREAKDOWN.	
1. JOSEPH NG'ANG'A:	0713682085
2. GABRIEL NAITA:	0728277096
3. GERALDINE WANJIKU:	0715841247
4. EDMOND KIPKORIR:	0720258248
5. RONALD MUSYOKI:	0704163747
6. JOSEPHAT LOKWANG:	0714652547
7. SAMSON EMEKWI:	0718181464

## **The Roles of the Water User Committee in ensuring the functionality of the Water Point**

- ✧ Mobilize community members to participate in water source protection e.g . Building the fence, and regular cleaning of the surrounding.
- ✧ Keep an updated list of the water users in the community.
- ✧ Collect and keep contributions towards the construction cost and the O&M funds
- ✧ Regularly visit and monitor the condition and performance of the water point
- ✧ Verification of the purchase of materials needed for the repair or maintenance of the water source.
- ✧ Pay for any repairs carried out by a mason or hand pump mechanic.

Source: ACF Uganda Mission (2010) 'Installation and maintenance manual for Hand pump technicians and borehole caretakers'

## 5. Pasture and grazing area management around the borehole

- ✧ Management of pasture around permanent water source  
(to preserve pasture around the permanent water source for dry season)

"Prolonged heavy grazing undoubtedly contributes to the disappearance of palatable species and the subsequent dominance by other, less palatable, herbaceous plants or bushes. Such loss of plant and, in consequence, animal biodiversity can require a long regenerative cycle (30 years in savannas, 100 years in rainforests). Excessive livestock grazing also causes soil compaction and erosion, decreased soil fertility and water infiltration, and a loss in organic matter content and water storage capacity." (FAO )

### Exercise 1<sup>3</sup>

#### **WHAT IS OVERGRAZING?**

##### **BACKGROUND**

Pastoralists often perceive the deterioration of their pastures due to overgrazing as if it affected the vegetation as a whole and not just one plant at a time and further as an effect simply of excessive numbers of animals. This exercise widens the perspective of what overgrazing entails.

##### **OBJECTIVES**

- for participants to be able to explain the process of overgrazing
- to understand concepts such as minimum resting time, maximum grazing time and overgrazing on a plant-by-plant basis
- to apprehend the process by which animals select priority species for herders to rehabilitate.

##### ***Introductory Practice***

1. Place some objects representing shrubs, forage, and pasture.
2. Let the participants, in turn, to choose and take the objects according to preference of livestock.
3. Once most of the objects have been picked by the participants, stop the game and ask participants to describe what they observed:
  - Did all the objects disappear equally fast?
  - Which objects disappeared first and why?
  - Do animals display food preference, as humans do?

<sup>3</sup> Adapted from: Pastoralist Field School – Guidelines for facilitation (FAO 2009) with minor modification

Now read out the story below as expressively as possible.

***The story of the village of Oukaltine***

*Oukaltine was once a green village in the midst of a lush savanna landscape. This savanna was very dense, with tall trees, bushes and plants of various kinds of species and in very great numbers. There were also so many wild animals that the population could get all the meat it needed by hunting.*

*The community was good at using its village lands: its livestock was in good condition and produced enough milk and meat. This situation lasted until about thirty years ago, when the young people began to migrate towards the city, the herders' organization began to fall apart, and there was less control over the land management. For example, livestock was allowed to wander without supervision. Animals remained close to the village and its well and essentially grazed the same spots constantly. Without any controls, the animals had plenty of time to choose the fodder plants they liked best. Of course, they began to seek out the most appetizing ones. After some time of grazing, these plants tried to regenerate by producing very tender shoots that were even more delicious than the older part of the plant, and to which the animals gravitated as soon as they emerged. Indeed, each time a plant is grazed, it tries to regenerate after a few days, but if the livestock is still there waiting for the most tender shoots, the plant ends up exhausting its reserves and disappears completely. Once the most appetizing plant is gone, the animals are forced to settle for something a little less appetizing, just as we humans settle for bread when there is no more cake and we are still hungry. The same thing happened here: since the animals concentrated on this second type of plant, it suffered the same fate as the first, and ended up disappearing also.*

*Thus, one by one, the most appetizing species of plants disappeared, thus enabling the least appetizing plants to colonize the grazing area, until the only thing left on the grazing land were absolutely unpalatable plants that neither cattle nor wild animals would touch. The herd got thinner and thinner and the wild game began to disappear too. Monkeys that had previously come up to the huts to steal became scarce, and nobody remembered having seen any gazelles, which had been abundant in the old days, according to the village elders. Since there was now nothing left to feed the livestock, the herders had to migrate to other regions in perch of pasturage, thus erasing the name of Oukaltine from the map.*

7. Once finished telling the story, ask participants for questions or clarifications related to the story. Then have them discuss what happened in the story:

- Does this story remind you of anything that you have observed around your land?
- Does this story seem made-up to you, or do you think it's a true story?
- When you bring animals to new grazing land, what plants do they start to graze on? Why?
- Why do the animals return constantly to the same grazing spot?
- In your view, is overgrazing the fault of an excessive number of animals? Why or why not?
- What very practical lessons can one derive from this story, regarding the deeper causes of overgrazing and the degradation of pasture lands?
- In your own tradition, is there a proverb that might illustrate the important ideas contained in this story?

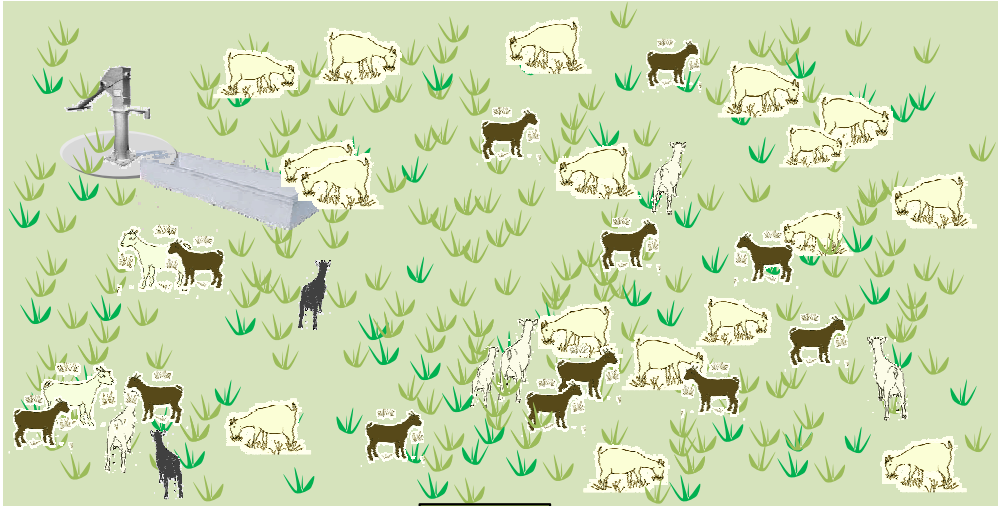
8. Remind participants what happened to the vegetation in the story, and how one species after the other disappeared according to which one was the most appetizing plant for animals.

9. Make the following points;

- The number of animals is not the issue: when the numbers are decreased, as in this story the environment is no better off.
- The issue is the fact that the plants are grazed selectively, one after the other.
- Insist also on the fact that the most tender parts of the plant (i.e., the new shoots) are most eagerly sought out by the animals, which are less interested in older vegetation that could tolerate grazing.
- Overgrazing occurs on a plant-by-plant basis over time; given enough time, a single animal left continuously in a large pasture can cause overgrazing.

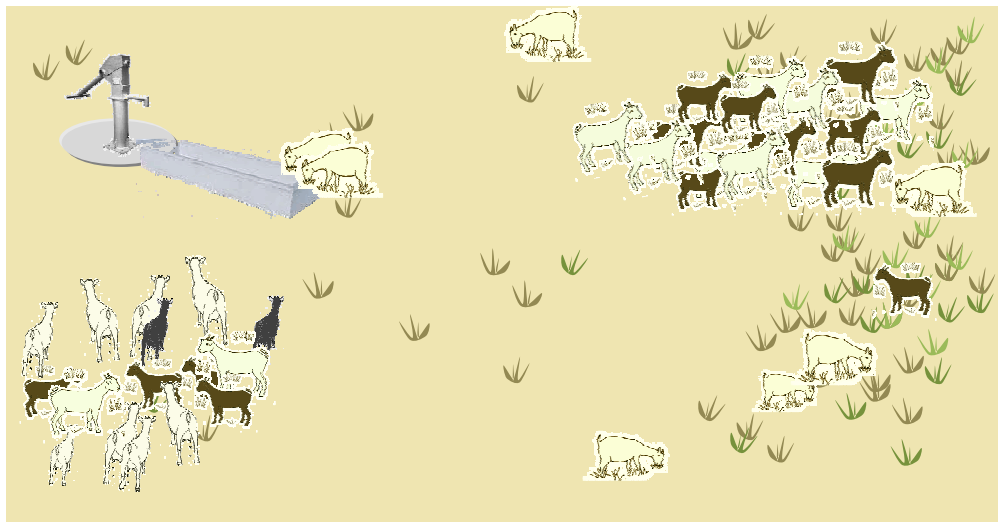
During wet season:

Grazing and consuming pasture around the borehole



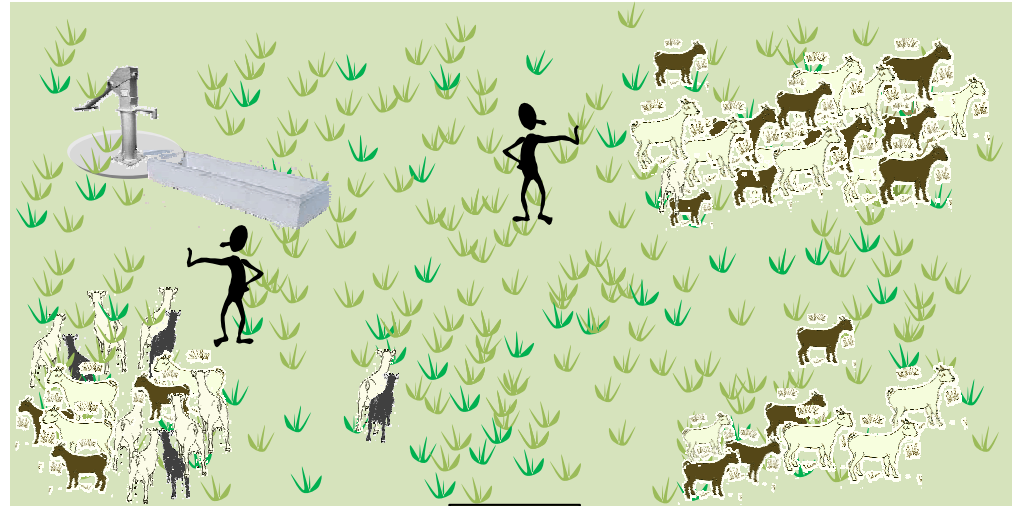
During dry season:

Need to move as pasture has been consumed although water is available



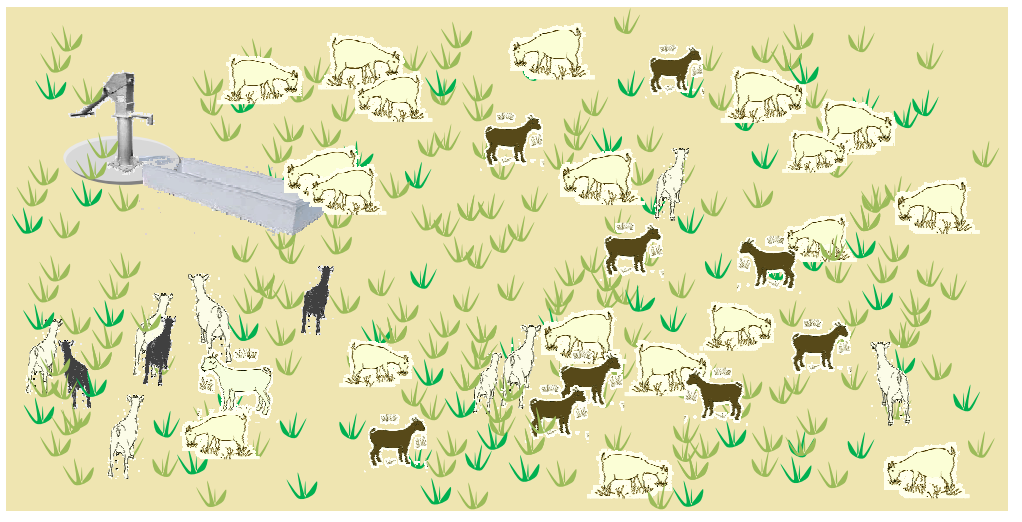
During wet season:

Graze far from borehole and preserve pasture around the borehole



During dry season:

Both pasture and water are available around the borehole



## **Exercise 2<sup>4</sup>**

### **SOIL AND THE IMPACT OF ANIMALS**

#### **BACKGROUND**

Sometimes there is a lack of awareness of the relationship between time and overgrazing. An understanding of concepts such as resting period (during which vegetation is protected from the livestock) and grazing period (the length of time animals stay in a certain grazing area) is necessary, as well as an understating of the "time" factors.

#### *Objectives*

- to understand the relationship between overgrazing and the lack of control over time (leading to deterioration of vegetation)
- to understand that the impact of livestock on the land can be either positive or negative depending on the "time" factor.

#### *Steps*

#### **1. TELL THE STORY IN THE BOX BELOW FOR THE PARTICIPANTS.**

##### ***THE DONKEY TRAILS***

*An old woman lives all alone. Each day she takes her donkey to get water from the well. After a year, she notice that the donkey has worn a path between her hut and the well, on each side of which the vegetation has been totally destroyed, because the donkey has eaten everything and has worn away soil by passing over the same spot over again with his hooves.*

*One day, the old woman's friend decides to help her by bringing her enough water to last about one hundred days. They get organized to set out together with all the donkeys in the village, and bring back to her all the water she will need for three months. She is very happy.*

*But in the course of this one day, the hundreds of donkeys from the village have brought tremendous damage, not only along the path, but in the entire field. The grass has been trampled and the soil torn up! Once the hundred days have passed, however, the old woman and her friend are overjoyed to see that greenery has invaded the entire field as well as the trail, which has nearly disappeared.*

#### **2. ASK THE PARTICIPANTS THE FOLLOWING QUESTIONS:**

- What happened to the soil in the story?
- What effect did the large numbers of animals stampeding over the ground have on the soil?
- Can animals break the hardpan crust with their hooves?
- How do the droppings of animals affect the soil?
- How much time do the plants need to recuperate completely?
- What happens if one does not give the plants a minimum resting period?
- What happens if animals are kept too long in a single grazing spot? When is the ideal time to move them?
- What conclusions can be drawn from this story?

<sup>4</sup> Adapted from: WAPPP Outreach Manual for Pastoral Communities (Hall, 2002)

## Management of borehole with relevant natural resources

### 5.1. Pre-session

To review and remind the possible impacts of new borehole in both positive and negative, as well as issues they have learnt and discussed in the previous sessions. Management based on the expected issues shall be discussed in the following part.

### 5.2. Management of hand pump and relevant resources to maximize the benefit and minimize negative impacts

Ask the following question to come up with preferable management

Q. Understanding the proper use of the hand pump, how can they assure that the hand pump is properly used to minimise problem?

Q. Based on the discussion made on possible impact of newly established boreholes, how can they avoid negative impacts of;

- Misuse and breakage of the hand pump
- Congestion of people and livestock
- Overgrazing,
- Conflicts and fights among people
- Hygiene and sanitation problem



Source: [www.mottmac.com](http://www.mottmac.com)

### How to avoid negative impacts

e.g

- Making rules and regulations
- Awareness creation to protect environment e.g. fencing
- Attempts to regulate stocking rate and controlling grazing pattern
- Forming and operating rangeland management committee
- Conflict sensitive approach (how to ensure peaceful borehole operation: preventing triggers of violence regarding borehole use, addressing different possible type of conflict causes
- Specifying management body, duty operators, guards, etc.
- Penalties for violation of rules
- Sensitization of community to enhance ownership
- Promote sanitation practice to protect water source and taking safe water

## Possible management rules and operation

### ✧ Rule in use of borehole water by different users

e.g

- Internal users (mainly for domestic use):
  - e.g watering orders to be controlled
- Livestock purpose:
  - e.g animals should be watered only at the trough in turn
- Seasonal user (outside pastoralist):
  - e.g should report to elders before using borehole
- Any other users (e.g. commercial traders, etc)

### ✧ Rule in use of borehole water

e.g

- Animals should not be allowed to enter nearby the hand-pump
- Users should take part in cleaning tasks of surrounding environment
- Users should contribute Ksh. \_\_\_\_ per season to cover maintenance cost (or registration fee of the O&M schemes)



Source: [waterjournalistsafrica.wordpress.com](http://waterjournalistsafrica.wordpress.com)

### ✧ Rules and mutual understanding on rangeland management:

e.g

- Area to preserve for dry season, especially a certain distance from borehole
- When to open the borehole for livestock (Borehole can be open for livestock use only during dry season or particular time to conserve pasture)
- How to maintain the rule and how to supervise?,
- Any penalty for violation?

Discuss and come up with realistic and feasible rules that can be agreed and followed by all the users



Who will be responsible?

- ✧ Assigning particular people such as;
  - Operator: who direct and keep order in watering??
  - Person in charge to monitor preserved area for dry season??
  - Who keep the key of chain??
  - In case of any conflict??



Source: EcoRAD Project

- ✧ Supervision and responsibility of the owner community
  - How the community can make decision and solve in case of problems??
- ✧ Regular operation and monitoring system of management (how to operate and who to be responsible)

## 6. Way forward

## Annex 1

### Technical instruction of pump maintenance (information for pump technicians)

#### **PARTS OF INDIA MARK II**

1. Plunger rod
2. Reducer cap
3. Sealing ring
4. Plunger yoke body
5. Upper valve guide
6. Spacer
7. Follower
8. Cylinder body
9. Brass liner
10. Hex. Coupling (M 12 x 20)
11. Rubber seating
12. Pump Bucket
13. Rubber seat retainer
14. Check valve guide
15. Check valve seat

#### **INSTALLATION PROCESS OF INDIA MARK II**

- Re- Assemble cylinder: Test cylinder in a bucket of water. If check- valve leaks replace it.
- Remove cover of pedestal and re-measure depth of water level in tube-well, then Chlorinate tube-well
- Joint first connecting rod to plunger rod
- Screw first pipe into cylinder using jointing compound. Tighten fully, then wipe off excess jointing compound.
- Lower cylinder, first pipe and connecting rod into tube-well and clamp the pipe

(Cylinder should be installed at a minimum depth of between 24 meters(80') and 40 meters(120') for maximum efficiency. Cylinder installed at greater depth will require more pumping effort. NEVER INSTALL A CYLINDER LESS THAN 6 METERS(20') FROM THE BOTTOM OF THE TUBE-WELL)

- Put jointing compound on pipe threads, join connecting rods together, joint pipe together tighten fully then tighten fully against couplings. Wipe of excess jointing compound. Finally Lower cylinder, pipe and connecting rod into tube-well using pipe lifters and clam with self-locking clamp. Continue to last pipe.
- Screw water tank to last pipe and tighten fully.
- Carefully Lower water tank on to pedestal with the water tank lifter and pipe lifters and spout must face drain.
- Push rod down as far as possible, mark rod level with top of water tank
- Lift rod for as for as possible, cut at mark, clamp rod with the help of connecting rod vice, put cloth into water tank opening so that cutting do not fall in and File top of rod to smooth.
- Thread top connecting rod for at least 50mm(2") make sure the thread is clean and true. Check thread with check nut. You must be able to screw the nut all the way down the thread by hand , then now remove the cloth.
- Remove inspection cover and handle, Lower head onto water tank then fit check nut while the rod goes through guide bush.
- Screw chain onto the rod. Use two spanners tighten check nut fully against chain coupling.
- Lifty evenly, Lower head onto water tank. Remove rod clamp. Bolt, fit check nuts and then tighten fully.
- Insert handle through head , Adjust handle then insert Axle. Tap lightly, Do not hammer then Fit washer nut and check-nut to axle fully.
- Lift chain coupling with a crowbar so that you can move the handle easily. Bolt chain with handle and grease chain.

### **DISMANTLING THE PUMP.**

1. Remove inspection cover from head assembly
2. Disconnect handle from chain by removing the nyloc nut and bolt
3. Take out handle- axle. While removing, use axle punch toe protect axle thread and remove handle from head assembly.
4. Remove flange bolts from head assembly
5. Insert one pipe lifter into the holes provided in the head assembly and lift up.
6. Fit the connection rod vice onto the water chamber top flange and tighten vice against connection rod
7. Remove chain & chain lock nut and remove head assembly
8. Support connecting rod with connecting rod lifter, ollsen connecting rod vice and remove. Gently lower connecting rod. Remove connecting rod lifter.
9. Remove water tank bottom flange bolts.
10. Lift water tank by using water tank lifter and pipe lifters.
11. Fit self locking clamp and remove water tank.
12. Disassemble rising main and connecting rods.
13. While removing the pipes and rods, ensure that you place these on the pipes stands. Continue doing so until the entire below- ground assembly has been removed from the tube-well
14. Disconnect cylinder from the last pipe.
15. Check all the pipe threads, clean out the threads using wire brush. Remove any dirt and rust from the pipes by using wire brush or sandpaper. If any pipe is damaged, replace. Ensure that all pipe couplings are intact and fit properly.

### **CONNECTING RODS**

16. Check all the connecting rod threads and couplings. Clean out threads with wire brush. Remove any dirt and rust from the rods by using wire brush or sandpaper. Re-thread connecting rods if required. Check each rod for straightness. If rods are bent, try to straighten them. If not possible, replace.

### **CYLINDER OVERHAUL**

17. Unscrew top and bottom reducer caps using wrenches. Remove piston assembly and check-valve. Inspect piston and check- valve assembly, and replace any worn out components. If necessary, replace nitrile cup-washers nitrile sealing ring, rubber seating, etc. check for cracks which may have developed in the cylinder components. Replace parts, if necessary, reassemble complete cylinder.
18. Fill up cracks in the platform with cement. Make sure that exposed platform is again cement plastered.
19. To reinforce the hand-pump pedestal base, dig out a circular space around the pedestal and fill this up with a 1:2:4 concrete mixture. Whenever-cement plaster for concrete mixture is reapplied to an existing platform, seven days curing time should be allowed. Disconnect the handle from the chain so that nobody can operate the pump and ask the villagers not to use the hand-pump for the duration of the prescribed time. The required setting time can be reduced to 24hours, if a quick setting cement compound is used.

# *Attachment D9*

*Memorandum of Understanding  
Regarding Borehole Maintenance Fund*

**MEMORANDUM OF UNDERSTANDING**

**Between**

**Turkana County Government**

**And**

**Lodwar Water and Sanitation Company Ltd.**

**For**

**Installation of Solar Power Pump System to Lodwar Water and Sanitation  
Company Ltd.**

**Under**

**The Project for Enhancing Community Resilience against Drought in Northern Kenya  
(Japan International Cooperation Agency (JICA)-ECoRAD Project)**

This Memorandum of Understanding (MOU) is entered into by

**Turkana County Government hereinafter referred to as “County Government” its assignees or  
successors represented by Mr Ekutan Wonyang’ Paul, the County Chief Officer for Water,  
Irrigation and Agriculture**

**And**

**Lodwar Water and Sanitation Company Ltd hereinafter referred to as “LOWASCO” its  
assignees or successors represented by E J Esekon, Managing Director for the purpose of  
establishing the partnership between the parties.**

The three Parties agreed as follows:

**Article 1 Objective**

The objective of this memorandum is to establish an effective partnership (1) to raise a special fund that shall be exclusively utilized for repair and maintenance of boreholes with hand pump in the pastoralists' communities in Turkana County as well as (2) to support financial status of LOWASCO. In order to achieve better service, both parties are fully committed to the goals and objectives of the implementation of this programme.

*HA*      *DW*      *EJ Esekon*      *Ekutan Paul*  
*John*

## Article 2 Background

LOWASCO Operates 8 no. boreholes along river Turkwel which provide water to residents/communities in its area of jurisdiction as defined in its Service Provision Agreement (SPA) with Rift Valley Water Services Board (RVWSB). LOWASCO incurs high O&M costs due to the high electricity tariff of KPLC (Kenya Power and Lighting Company) in Lodwar whose electricity power is gotten from diesel generators. The current water tariff is Ksh 33.00 per cubic meter and has been maintained at that rate due to high incidences of poverty which stand at 96% nationally. The production cost of 1 m<sup>3</sup> is Ksh 45.00. A tariff adjustment from Ksh 33.00 to 48.00 has been applied through RVWSB in 2013 but is being considered by WASREB (Water Services Regulatory Board) against the poverty background.

LOWASCO also has a scheme of hand pump maintenance service without any charge from the borehole management body, utilizing the water tariff collected from the water service delivery. However, LOWASCO has not been able to spare enough fund for borehole pump repair having a list of borehole with outstanding maintenance and rehabilitation costs.

Solar power pumping system needs vast initial investment, but no operation and maintenance cost is required. However, existing pumping system with power supply from Kenya Power with standby diesel generators requires continuous expense for fuel consumption. The solar system has a big economical advantage to reduce total O&M cost. On the other hand, water fee collection will be continued at the same tariff of the current agreement, which will result in producing surplus of fund. It is therefore expected that LOWASCO can have enough operation fund for sustainable use of the pumping system. And an excess of such operation fund can be diverted to a special financial source for the routine maintenance and repair cost in the pastoralists' communities as the "preparedness".

JICA-ECORAD Project wishes and proposes to replace the existing pump systems of LOWASCO and supplement with solar power under the project, in order to reduce O&M cost and raise the additional fund for repair and maintenance of hand pumps in the rural parts of Turkana County.

Diocese-Lodwar currently operates the hand pump maintenance services (Cost Sharing) under Turkana Water Project, and it is understood that the Diocese has sufficient capacity and the most suitable organization for pump maintenance works in Turkana County.

## Article 3 Implementation Programme

1. At first, the County Government shall exchange the agreement with Diocese of Lodwar on repair and maintenance services of boreholes.
2. On conclusion of consensus among the concerned parties, JICA ECoRAD Project will make service contract with a solar pump supplier to supplement solar power pump system(s) at LOWASCO.
3. The newly installed solar pump system(s) shall be assets of the County Government and be operated and maintained by LOWASCO under the supervision of RVWSB.
4. LOWASCO shall continue to collect water tariff at Ksh. 33 while reducing the O&M cost.
5. The fund raised from reduction of the O&M cost shall be recorded.
6. The amount saved from O&M shall be reported monthly to the County Government.

*AA*

*DW*

*E-sasekan*

*ELCU TAN AUL*  
*John*

7. LOWASCO shall share the raised fund with the County Government as a levy as specified in Article 5 in this memorandum.
8. The County Government shall make payment to Diocese of Lodwar as will be agreed with Diocese.

#### **Article 4 Roles and responsibilities of the parties**

##### **1. County Government shall;**

- Be the asset owner of the solar power pumps installed at LOWASCO under JICA-ECORAD Project,
- Have the responsibility for effective use of the fund raised through this implementation
- Participate in the design, implementation and supervision solar installation, and
- Exchange the agreement of a contract with Diocese of Lodwar for providing maintenance services of boreholes with hand pump in the pastoralists' communities in Turkana County.
- On behalf of the County Government supervise all the activities concerning the implementation of both LOWASCO and maintenance services carried out by Dioceses of Lodwar,
- Communicate with the concerned communities to prepare an annual schedule for pump maintenance, and
- Have access to all the financial documents concerning the implementation

##### **2. LOWASCO shall;**

- Operate and maintain the newly installed solar power pump system by the JICA-ECORAD Project,
- Continue the applicable operation to collect water tariff as per the service provision agreements,
- Pay rental fee to the County Government as specified in Article 5 in this memorandum, and
- Provide other required support to the Turkana County Ministry of water, irrigation and agriculture Office as specified in Article 5 in this memorandum.

##### **3. JICA-ECORAD Project shall;**

- Select the most suitable existing pump of LOWASCO to be supplemented by power pump system and design the improved pump system,
- Procure and install a solar power systems supplementing the existing pump system with a service contract to be concluded between the ECoRAD Project and solar pump supplier, and
- Monitor and evaluate the activities concerned on this memorandum and assist the concerned parties as required during the project of ECoRAD.

*HA*

*Onis*

*Wasekan*

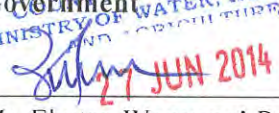
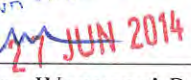
*ELIJAH PAUL  
John*

**Article 5 Provision of the Memorandum**

1. LOWASCO shall report monthly to the County Government and copy to ECoRAD (for the period of this MOU) the financial status including:
  - Operation hours and O&M cost of the concerned solar pump
  - Corrected water tariff calculated based on the operation hour of the concerned solar pump and
  
2. The fund raised through the implementation of this programme shall be shared as below:
  - The County Government : 60%
  - LOWASCO : 40%
  
3. LOWASCO to pay the calculated amount of the above to the County Government every month

This Memorandum is entered into on June 23, 2014 for the duration of one year between June 23, 2014 and June 23, 2015 and may be extended and/or modified at any time by mutual agreement.

For and on Behalf of Turkana County Government

  
  
Mr. Ekutan Wonyang' Paul  
County Chief Officer  
Turkana County Ministry of Water,  
Irrigation and Agriculture.

For and on Behalf of Lodwar Water and Sanitation Company Ltd.

  
Lt Col (Rtd) E J Esekon,  
Managing Director,  
Lodwar Water and Sanitation Company Ltd.

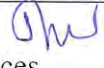
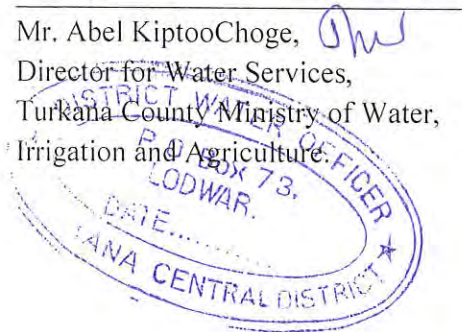


Witness

For and on Behalf of County Office of Ministry of Water, Irrigation and Agriculture

For and on Behalf of JICA-ECoRAD Project

Mr. Abel Kiptoo Choge,  
Director for Water Services,  
Turkana County Ministry of Water,  
Irrigation and Agriculture.

Mr. Fumiaki Murakami,  
Team Leader, JICA-ECoRAD Project




AMENDMENT TO ARTICLE 5 SECTION 2

OF THE MOU BETWEEN THE TURKANA COUNTY GOVERNMENT AND JICA-ECORAD  
ON PROJECT SAVINGS PAYABLE TO DIOCESE OF LODWAR BY LOWASCO FROM  
SOLAR PROJECT

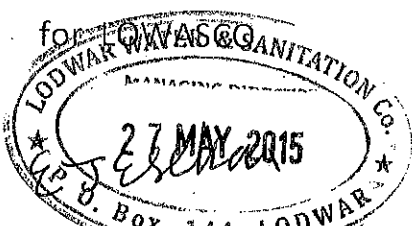
Please refer to Article 5 Section 2 of the Memorandum of Understanding signed between the Turkana County government and Japan International Cooperation Agency Enhancing Community Resilience Against Drought (JICA-ECORAD). The said project has been completed successfully and monitoring of savings by LOWASCO was undertaken by JICA-ECORAD from October, 2014 to date.

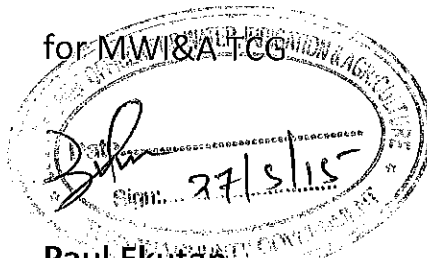
It was agreed that that the saved hours be shared at a fixed rate of 3 hours to be paid daily to the Diocese of Lodwar (DOL) and LOWASCO to work hard to realize the benefit of saving the balance of 5 available hours. It was also agreed that payments be made bi-annually. The sharing of solar savings formula will be revised from time to time by mutual agreement between the Turkana County government and LOWASCO as the financial situation improves. This amends the earlier arrangement of sharing the savings at 60 % and 40 %.

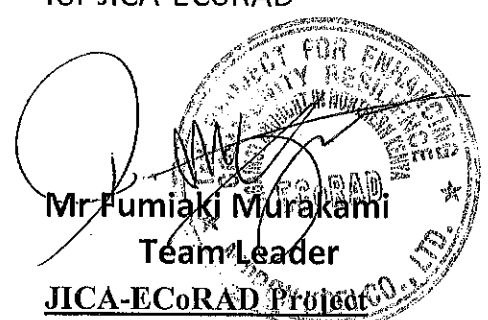
The fixed rate electricity savings by solar are calculated using current Kenya Power tariffs formulae shown in the attached KPLC schedule. A 30 day month is assumed and the annual savings in the 3 boreholes totals Ksh **900,000.00**. The bi-annual amount payable as fixed solar savings is therefore **Ksh 450,000.00**.

LOWASCO is now ready to make the initial payment of savings made from the month of November, 2014 to April, 2015. A payment of **Ksh 450,000.00** is hereby made to the Turkana County government and payable to the Diocese of Lodwar in accordance to the Memorandum of Understanding signed between the Turkana County government and JICA-ECORAD.

Thank you for the successful cooperation between the Turkana County government and JICA- ECoRAD

for LOWASCO  
  
E J ESEKON psc (K)  
Lt Col (KAF, Rtd)  
M D LOWASCO

for MWI & A TCG  
  
Paul Ekutan  
Chief Officer  
WI & A TCG

for JICA-ECORAD  
  
Mr Fumiaki Murakami  
Team Leader  
JICA-ECORAD Project