

KUJENGA MAISHA EAST AFRICA-KUMEA



PROJECT COMPLETION AND IMPACT ASSESSMENT REPORT FOR WESTERN WATER LIVELIHOODS PROJECT

“Develop sustainable livelihoods with communities through water & sanitation access for schools & communities”

TABLE OF CONTENT

ITEM	PG
1.0 Executive Summary.....	2
2.0 Background of Western Water Livelihoods Project.....	3-4
3.0 Project Implementation Performance.....	5-9
4.0 Outcomes of Project Interventions.....	10-11
5.0 Key Project Impacts	11-14
6.0 Project Impacts in relation to Millennium Development Goals.	15
7.0 Project Impacts based on Sustainable Development Goals.....	15
8.0 Other Key Project Impacts	16-17

Annex 1: Project Photos

List of tables

Table No.	Description	Page No.
<i>Table 3.1.1</i>	<i>Summary Construction of Water points progress in the different Project areas</i>	<i>5</i>
<i>Table 3.1.4</i>	<i>Analysis of hand dug wells water points in various villages &beneficiaries</i>	<i>6</i>
<i>Table 3.1.5</i>	<i>Analysis of spring water points in various villages &beneficiaries</i>	<i>7</i>
<i>Table 3.1.6</i>	<i>Analysis of Water &sanitation in schools & beneficiaries</i>	<i>8</i>
<i>Table: 3.2.3</i>	<i>Ecological Sanitation promotion in target villages for Agroforestry promotion</i>	<i>8</i>
<i>Table:3.2.4</i>	<i>Support farmers' groups with Cassava seedlings for food security & sustainable agriculture</i>	<i>8</i>
<i>Table 5.1.1</i>	<i>Community contribution ratio for Water and Sanitation facilities</i>	<i>11</i>
<i>Table 5.1.7</i>	<i>Inventory of Households Kitchen Gardens</i>	<i>12</i>
<i>Table 5.1.8</i>	<i>Cost benefit analysis and value for money aspects for completed water livelihoods projects</i>	<i>13</i>

1.0 EXECUTIVE SUMMARY

The Western Water livelihoods project has been under implementation for the last two-years from November, 2022 to November 2024 through implementation by Kujenga Miasha East Africa-KUMEA with funding from NAK-Karitiative. The project covered Matayos sub county of Busia County, Bumula subcounty and parts of Kanduyi subcounty in Bungoma County.

The project has worked with 10no. schools and 10no.women/youth groups for hand dug well water-points and 10no. Community groups for spring water-points. Throughout the implementation process the project has worked with partners and stakeholders i.e. Sub county Agriculture department, Farmers Training Center at Mabanga ,Ministry of Education and Department of Fisheries at the County level.

The choice of technology for the project's water supply implementation was roof catchment tanks for schools based on Ferro-cement technology , hand dug wells for the communities fitted with solar pumping unit and spring protections in target villages. All the water points have been fitted with drip irrigation to enhance sustainable food production for target villages and also schools. Some project sites have integrated tree nurseries to diversify into forest livelihoods. For sanitation, Ventilated Improved Pit-latrines for 4doors was constructed in target schools, promotion of Ecological sanitation concept and technology based on recycling of waste and hygiene & sanitation improvements in schools. School sanitation has been well addressed by physical facilities in form of Ventilated Improved Pit latrines and through Effective Micro-organism for degrading & suppressing the waste and providing schools with ease of maintaining the latrines since the flies, bad odors and worms have been contained.

Adequate Capacity building and the training components of the project included on-site and workshops, follow-ups, demonstrations which have enabled the communities to operate, maintain and manage the installed facilities, collaborate with other stakeholders to facilitate sustainability.

The project has been well supported by other key stakeholders namely Ministry of Education in promoting school water and sanitation improvements and Ministry of Agriculture Fisheries department for scaling up Fish farming livelihoods for spring water points.

The purpose of this project completion and impact assessment report is therefore to assess the performance of the project against the objectives it set out to achieve. Also assess the completion of the various project outputs as stated in the initial project proposal.

The Project performed very well in achieving all projects targeted components (100%) which include construction targets-water and sanitation facilities in target villages and schools, Project appraisal process through participatory Rural Appraisals, Conservation Agriculture and organic farming, Vegetation production orientation and establishing sustainable vegetable production process. There has been improved socioeconomic performance from groups selling vegetables and schools enhancing school feeding programs at reduced costs due to vegetable production and spring water points benefiting from fish production via fish farming & ponds facilitated by the project as part of livelihoods improvement at the village level.

In conclusion, the Western Water Livelihoods project phase one has achieved its objectives by maximizing respective contributions from all the parties. Water access and livelihoods intervention has been given equal attention hence the replications of households' kitchen gardens which will ensure sustainability in food production. Cassava and tissue banana production at households level has improved households food production and sufficiency. The lessons learned in this project will be in-built in other similar projects to improve the quality of project implementation and interventions.

2.1 Background of the Project

Western Water Livelihoods was initiated in November , 2022 with funding from NAK-Karitativ of Germany after approval of the water livelihoods proposal. The project has been working in 3 sub counties I.e. Matayos of Busia County ,Bumula and Kanduyi subcounties of Bungoma county. The project objective has been to improve access to safe water, Improved sanitation in schools and pilot villages ,improved livelihoods, enhanced food security and improved natural resource management.

2.2 Key project components

a) Sustainable agriculture and food production

The project promoted sustainable agriculture options to enhance effective land utilization for food production via promotion of conservation agriculture for all target groups involved. The target groups involved through water access for hand dug wells have been able to undertake drip irrigation for vegetable production. All the 10no. Women Groups for hand dug wells ,10no. Community groups for spring protection and 10no.target schools have vegetable production. Schools are able to provide school children with adequate vegetables and also sell excess to community members. The drip irrigation in schools has also improved agriculture practical lessons due to the adaptation of smart agriculture options via drip irrigation. All the target water points have adequate food supply through vegetable production,cassava and tissue banana production. All the group members of the water point have kitchen garden at their households to enhance sustainable food production at household level.

b) Promoting water efficiency & low-cost interventions

In each sub county the project worked with women group to construct shallow wells through community participation and also construction of Ferro-cement water tanks of 30,000litres for each school. The water point at the community for the women groups was fitted with solar pumping kit and 5,000litres tank. Water from the wells was pumped to the tank then community could access drinking water from the 5,000litres and part of the water was utilized for drip irrigation via the water tank. The utilization of water for domestic use and irrigation has enhanced effective use of the water point minimizing water wastage and time hence efficiency in water delivery.

c) Promotion of recycling for waste & garbage for food production

The project has trained all the 10no. women groups who have benefited from the water point on organic farming. The use of animal and chicken waste as manure to improve soil quality and hence improved food production. Through ecological sanitation the community members have access to SANPLAT/Arboloo latrines which after filling up households will transfer the superstructure and slabs to new latrine sites and use the filled pits for fruit tree production by planting mango, orange seedlings or banana seedlings to enhance food production

d) Promotion of Renewable energies for Water utilization, irrigation and energy at household

All the 10no. hand dug wells completed have been fitted with solar pumping unit and water is pumped to 5,000litres tank then community access water for domestic use while the drip irrigation installed at the tank provides water for vegetable production. The utilization of solar pumping system reduces the time when spent pumping water at the water points and irrigation of the crops can be administered by one person or can be systematical controlled by the group. Also water collection time can be controlled to ensure balance of water for irrigation and domestic use. Effective water collection and use has empowered women to address other pressing needs while the food production is well managed.

e) Effective use of sanitation facilities in schools and promotion of Girl child education

The ventilated Improved pit latrines constructed in schools are target for utilization by school girls to enhance improved access to sanitation and also provide access for menstrual hygiene support. The girls can clean up from the facilities during menstrual periods hence improve their hygiene. Previously the girls would miss schools due to menstrual challenges. The promotion and use of effective micro-organism for school sanitation has also improved sanitation in schools by enabling the old latrines to be hygienic to use hence accessible by the school population. EM solution is able to degrade waste ,reduce odour and flies from latrines making latrines hygienic for use.

2.3 Final Goal

Improving Quality of life for women and school children through sustainable rural livelihoods and horticulture farming

2.4 Intermediate Goals

- a) Improve access to safe water for utilization by community members and school
- b) Improve sanitation access for schools and communities through safe disposal of waste and hygiene & sanitation practices
- c) Improve community natural resource management and sustainable agriculture production
- d) Improve capacity building of various community & farmers group sustain various project activities

2.5 Key Project Strategies Applied

- a) Utilization of Participatory Rural Appraisal process for project planning and resource mobilization at community level
- b) Promotion of conservation agriculture and organic farming for sustainable food production
- c) Improve school sanitation access through construction of Ventilated Improved Pit-latrines for Girl Child access to quality education
- d) Utilization of drip irrigation for all the water points to enhance food production and water livelihoods
- e) Promote Ecological sanitation for improved sanitation and agroforestry through adaptation of Effective Micro-organism technology for school sanitation and Arboloo /SAN PLAT latrines for agroforestry promotion
- f) Promote role of women in Water and Environmental sanitation through targeting women groups for water point development and sanitation development through SANPLAT slabs
- g) Liaison and working with schools to develop demonstration farms for Competency Based Education and also involvement of 4K Clubs for sustainable agriculture
- h) Partnership with County Institutions i.e. Department of Education, Agriculture and Fisheries departments

3.0 THE PROJECT IMPLEMENTATION PERFORMANCE

3.1 THE PROJECT COMPONENTS

The Western Water Livelihoods had 5 key project components during implementation. These are: Develop low cost water options for Community, target farmers' groups and Schools, Improved sanitation access for schools to enhance girl child education, Natural Resource Management , Sustainable Agriculture and improved livelihoods, Capacity building and Partnership with various stakeholders

3.1.1 DEVELOP LOW COST WATER OPTIONS FOR COMMUNITY, TARGET FARMERS' GROUPS AND SCHOOLS

This component involved construction of Ferro-cement water tanks , hand dug/shallow wells fitted with Solar pumping system and spring protection&construction. All the water points had drip irrigation installed to enhance food production at village level and respective target schools. Table below provides progress of construction activities;

Table 3.1.1 Summary Construction of Water points progress in the different Project areas

TYPE OF WATER SYSTEM	SUBCOUNTY	PLANNED	ACHIEVED	UNDER CONSTRUCTION	% ACHIEVED
1. SHALLOWWELLS	BUMULA	10	10	0	100%
	TOTALS	10	10	0	100%
2. FERROCEMENT WATER TANKS	BUMULA	9	9	0	100%
	MATAYOS	1	1	0	100%
	TOTALS	10	10	0	100%
3. SPRING PROTECTION	BUMULA	3	3	0	100%
	KANDUYI	7	7	0	100%
	TOTALS	10	10	0	100%
OVERALL TOTALS & RATING					100%

All planned water points constructed and are operational supporting target communities and schools in the project area.

Table: 3.1.4 Analysis of Project sites and beneficiary for various village water points (Shallow wells)

NO.	SHALLOW WELL	BENEFITING VILLAGE	NO. HOUSEHOLDS	NO. OF PEOPLE	NO. SCHOOLS	MARKET
1	Imani Bora women group	1. Lurare 2. Sinoko B 3. Sinoko A 4. Kamurumba A 5. Kamurumba B 6. Khasolo C 7. Napara	200	2000	Napara primary Little Angels	Marram Market
2	Bititi youth group	8. Kamurumba A 9. Nambale 10. Masielo 11. Sinoko A 12. Sinoko B 13. Lurare A	130	1300	Kamurumba primary	Marram Market
3	Siyengo youth group	14. Khasolo C 15. Sango B 16. Siboti 17. Sango A	70	700	Mukhekhe primary	-
4	Upendo women group	18. Sango C 19. Sango B 20. Siboti 21. Mukwa	100	1100	Sango primary	Sango Market
5	Mulembe women group	22. Kitabisi C 23. Kamurumba 24. Kitabisi B	150	1500	St. Jude Girls	-
6	Nakalila B youth group	25. Nakalila B 26. Nakalila C	50	500	-	-
7	Wapendanao women group	27. Nakalila B 28. Nakalila C	30	300	Nakalila Primary	-
8	Nangaki Self Help group	29. Nakalila C 30. Nambuchi	30	300	-	Nambuchi Market
9	Bumula organic group	31. Bunambobi A 32. Matokho central 33. Bumula 34. Lurare 35. Sinoko	90	900	Bumula primary Bumula secondary	Bumula market Bumula police station
10	Lunao wajane women group	36. Lunao A	50	500	Quarry primary	Quarry Market
	Totals	36 Villages	900	9100	10	7

Note:

10no. Shallow wells constructed for 10no. Community groups (women,youth groups and self help groups) have assisted 36 villages , 900 households access safe water reaching out to 9100 community members and supporting at least 10 schools in various villages and 7market centers.

Table: 3.1.5 Analysis of Project sites and beneficiary for various village water points (Springs)

NO.	SPRINGS	VILLAGE	HOUSEHOLDS	NO. OF PEOPLE	SCHOOLS	MARKET
1	Muricho spring	1. Nzoia 2. Dorofu 3. Wacheka 4. Wanyakha 5. Lkhuna	500	5000	Nzoia Township	Dorofu
2	Machomesi spring	6. Sabatia 7. Wanyakha 8. Muyiyi 9. Mufutu	100	1000	-	Dorofu
3	Musituti spring	10. Musituti 11. Namakanda 12. Lukusi 13. Buteki	450	4500	1. Kimugui Primary 2. Kimugui Secondary 3. Mwibale primary 4. Mwibale secondary	-
4	Efumbi fiti spring	14. Muyiyi 15. Fuchani 16. Spaki 17. Mbomele	190	1900	1) Fuchani primary 2) Fuchani secondary	Fuchani centre
5	Khamasa spring	18. Nainuka 19. Khamasa 20. Kimugui	230	2300	1. Kimugui pri 2. Kimugui sec 3. Nainuka Academy	-
6	Mabusi spring	21. Khaweli 22. Mabusi 23. Lutungu	137	1370	1) Mabusi pri 2) Khaweli pri 3) Mabusi sec	-
7	Kibachenje spring	24. Nakholo C 25. Nakholo A 26. Nakholo B 27. Lukusi 28. Sango A	479	4790	1. Kibachenje COG 2. St. Johns Nakholo	Kibachenje market
8	Munyolo spring	29. Nakholo B 30. Lumboka 31. Nakholo	80	800	Nakholo primary	-
9	Namwetunde spring	32. Sango A 33. Sikata B 34. Namono 35. Sango B 36. Kibachenje	326	3260	1) Kibachenje primary 2) Kibachenje progressive Academy	Kibachenje market
10	Namausi spring	37. Khakula 38. Namausi 39. Napongo	110	1100	1. Napongo pri 2. Khakula pri	-
	Totals	39 Villages	2,602	26020	20 Schools	3Market Centers

Note:

10no. Spring water points completed are supporting 39villages,2,602 households with 26,020community members including 20 schools and 3market centers

Table: 3.1.6 Analysis of Target Schools and beneficiaries

County	Sub county	School	School population				Water tank	Sanitation
			Boys	Girls	Teachers	Totals		
Bungoma	Bumula	1. St. Kizito Masielo Sec. Sch	352	307	26	685	30000litre	1 no.4door VIP Latrines
		2. St. Joseph Bukirimo Sec.Sch	219	196	15	430	30000litre	1 no.4door VIP Latrines
		3. Mwiyinga Girls School	0	196	16	212	30000litre	1 no.4door VIP Latrines
		4. St. Peter Siboti Sec. School	376	460	27	863	30000litre	1 no.4door VIP Latrines
		5. St. Kizito Mayanya Sec.Sch	616	721	48	1385	30000litre	1 no.4door VIP Latrines
		6. Bishop Atundo Boys Sec. Sch	535	0	26	561	30000litre	1 no.4door VIP Latrines
		7. Nakalila RC Primary Sch	605	280	15	900	30000litre	1 no.4door VIP Latrines
		8. Shilila Primary Sch	404	322	14	740	30000litre	1 no.4door VIP Latrines
		9. Kimaeti Primary School	863	367	26	1256	30000litre	1 no.4door VIP Latrines
Busia	Matayos	1.St. Moses Sigwata Pri. School	200	200	15	415	30000litre	1 no.4door VIP Latrines
10no. Schools			4,170	3,049	228	7,447		

Note

10no. Schools that received water and sanitation facilities have accessed improved water access to 7,219 students and 228 teachers. A total of 3,049 Girls have access to ventilated improved pit latrines and improved Menstrual hygiene access. All the schools have vegetable production via drip irrigation for food supply sufficiency and provision of school meals

3.2.1 NATURAL RESOURCE MANAGEMENT AND SUSTAINABLE AGRICULTURE

Table: 3.2.3 Ecological Sanitation promotion in target villages for Agroforestry promotion

Type of activity	Group/village	No. of households involved
Orientation on Ecological Sanitation process & Casting /manufacture of SANPLAT/Arboloo slabs for Ecological Sanitation & Agroforestry	Imani Bora-	45
	Bititi Youth Group-sinoko A&B	15
	Total	60Households

Table:3.2.4 Support farmers' groups with Cassava & Tissue seedlings for food security & sustainable agriculture

Type of Activity	Group/village	No. of cassava seedlings provided for households cassava production
Provisions for Cassava seedlings to groups for food security & food production	1. Imani Bora Women Group	800
	2. Bititi Youth Group	800
	3. Wapendanao Women Group	800
	4. Nangaki Self Help Group	800
	5. Nakalila B Youth Group	800
	6. Mulembe Youth Group	800
	7. Upendo Women Group	800
	8. Siyengo Women Group	800
	9. Bumula Organic Group	800
	10. Lunao Wajane Women Group	800
	Total	8000
Provision of Tissue-Banana seedlings for food security	1) Namwentude Women Group	100
	2) Kibachenje Self Help Group	100
	Total	200

3.3.0 CAPACITY BUILDING AND PARTNERSHIP WITH VARIOUS STAKEHOLDERS

The project carried out various capacity building sessions and process with involvement of key stakeholders & partners. The following are the list of capacity building process carried out during implementation;

Type Of Activity	No. Planned	Actual No. Done	No. of Participants involved			Key outcomes	2
			Male	Female	Totals		
1. Leaders Orientation forum	2	2	33	12	45	Project Introduction, Stakeholders identification & analysis Terms of engagement	100%
2. Participatory Rural Appraisal	2	2	40	18	58	Village sites identification, Community Resource Mobilization & Management plan development ,Farmers group identification & stakeholders participation	100%
3. Conservation Agriculture & Organic farming	1	1	24	27	51	Promote sustainable & organic farming Improve community food production Promote natural resource management & reduce soil erosion	100%
4. On-site Vegetable production & agroforestry promotion for target schools & villages	30	30	400	500	900	Orientation on drip irrigation installation, Seedlings development for vegetable production and pests/weed management	100%
5. On-site Orientation on Effective Micro-organism application for target schools	10 schools	10 schools	200	250	450	Effective Micro-organism for school sanitation improvement & promote natural resource & waste management	100%
6. Water Resource Management Training	2	2	36	44	80	Develop capacity for sustainability and effective use of water points Promote productive use of water & sustainable livelihoods	100%
7. Ecological Sanitation & SANPLAT	2 villages	2 villages	24	23	47	Villagers able to manufacture slabs & construct household latrines. 60 no. Households latrines constructed	100%
8. Fish Farming	3	3	30	20	50	Trained Fish pond construction, Feed formulation & value addition	100%
9. Quarterly review meetings	8	8	100	240	340	Participatory Project review Project monitoring & stakeholders/partners participation	100%
9No. Different training & activities			887	1134	2,021		

4.0.0 OUTCOMES OF THE PROJECT INTERVENTIONS

4.0.1 Participatory Rural Appraisal

The Participatory Appraisal Process empowered the community to identify water point sites based on the various women groups affiliations. The identification proved to be positive impact towards community resource mobilization due to working with groups that are already organized and willing to participate actively towards project implementation. The process enabled the community to fully participate in project implementation and reduce conflict of interests during project implementation

4.0 2 School Access to safe water supply and drip irrigation for food production

The participation of schools towards construction of the Ferro-cement water tanks has generated additional benefits for schools with the installation of drip irrigation kit. The irrigation kits provide adequate opportunity for enhancing schools food security especially provision of meals for children thus reducing costs for parents. The drip irrigation provides demonstration farm for learners to appreciate agriculture lessons and support the current education system of Competency Based Education Curriculum(CBC). The adaptation of the agriculture lessons can easily be replicated by students to their homes once the undertake practical lessons in school.

The agriculture teaching staff have secured the relevant tools for facilitating their agriculture lessons hence provide adequate learning to the students/pupils in the target schools.

Schools can connect their water tanks to existing water lines which may not be reliable but once the water is filled in the tanks and there is disruptions of the water supply the schools will continue to meet their water needs due to adequate water storage. The water tanks provide schools with access to safe water and also for other needs. Drip irrigation uses minimum water unlike other form of irrigation.

4.03 Effective Application of Effective Micro-organism Solution (EM) to improve School hygiene and sanitation

Hygiene and sanitation promotion in schools through methods of active learning such as songs, poems and skits have enhanced behavior change and effective use of water and sanitation facilities in schools. Some schools have adapted the process to enhance peer learning to improve academic performance. The project initiated the school hygiene and sanitation promotion to enhance effective use of water and sanitation facilities in schools. All the target schools had their teachers oriented on the Ecological sanitation process to enhance disease prevention among school children at home and at school levels. All the target schools received water Effective Micro-organism (EM) kits to improve school sanitation and promote hygiene. The EM solution is able to degrade the waste in the latrines, reduce smell and eradicate flies and worms that are common in poorly maintained latrines. The use of Effective Micro-organism solution has saved the schools funds of digging new latrines since the can apply the solution on the filled up pit latrines to suppress the waste and use them effectively.

4.0.4 Development of Sanitation facilities in Schools via construction of ventilated improved pit-latrines

All the target schools had sanitation facilities developed for improved sanitation access for students especially girls in case of mixed schools. Through community participation the project constructed 10no. 4door Ventilated Improved Latrines for 10no. Schools .1no. 4door VIP latrines for each of the 10no target schools. The latrines in target schools had an impact on improving sanitation access for school girls and reduce drop out due to inadequate and poor sanitation. Also the latrines have improved menstrual

hygiene access for girls thus ensuring girls are in school during their menstrual periods. A total of 3,049 Girls have access to ventilated improved pit latrines and improved Menstrual hygiene access.

4.0.5 Training and Capacity building sessions

This focused mainly on the key trainings for Community resource persons at village level and schools for implementation and sustainability of project components

- a) Participatory Rural Appraisal process for enhanced community planning and resource mobilization
- b) Conservation and organic farming Methods-Effective minimum tillage & use organic fertilizer for improved sustainable food production
- c) Vegetable production and agroforestry has enabled most group members replicate vegetable production by having their own kitchen gardens in their homes so that they are self-sufficient towards food production. Vegetable production and drip irrigation in schools has enhanced students learning SMART agriculture concept and methods
- d) Water resource management training has enhanced communities and groups capacity to appreciate productive use of water and sustainable livelihoods.

5.0.0 KEY PROJECT IMPACTS

5.1.0 Community Contributions and participation

Community contribution and participation has been an important component in the implementation of the project. Community contributed local materials and unskilled labour during project implementation. The active participation enabled the project to achieve the desired objectives and even the physical development of facilities. The higher achievements in physical development are attributed to active community participation and contribution which enhances project sustainability and replication. The concept of community participation and contribution was built in project implementation process.

Table 5.1.1: Community contribution ratio for Water and Sanitation facilities

Type of water and sanitation facilities	% Community/school contribution	% Project Support by KUMEA through NAK Funding
1. Shallow Wells	30%	70%
2. School water Tanks for 30m ³	40%	60%
3. Ventiladed Improved Pit latrines	40%	60%
4. Households Sanitation-San plats	70%	30%

The implementation of the above projects has been successful and cost effective due to the flexibility of using various local available materials for construction of tanks i.e. Rough stones, sand and use of mud/wattle in case of Sanplat/Arbolloo latrines for agroforestry promotion

5.1.2 Ferro-cement Water Tanks Construction & fitted with drip irrigation kits

The project adapted a standard design of tanks of 30 m³ (30,000litres) each irrespective of the roof size. The use of local available materials i.e. hardcore, sand and props promotes the replication of water tanks. All water tanks have been fitted with drip irrigation systems to improve food production in schools and also utilize demonstration farms for school agriculture promotion & learning for students. The 10no. school water tanks constructed are serving cumulative population of 7,451 people (pupils & teachers) and providing water for irrigation for the 10no. schools.

5.1.3 Hand dug/ Shallow wells Construction & fitted with drip irrigation

All the completed shallow wells have been fitted with Solar pumping units with storage tanks of 5,000litres and have been sited in water occurrence sites. The wells are functional and in good condition. They are serving households by providing adequate water for drinking, other domestic use and irrigation. The hand dug wells have been lined with culvert rings due to unstable soil formation. Community participated in digging of the wells up to the water level and assisting the artisans in construction of the wells. Each water point committee/group provided adequate land for drip irrigation. The drip irrigation provides groups with opportunity to utilize the water for food production i.e. vegetable production. Land owners have

signed land easement agreement letters to allow community members use the water point without any interruptions. 10no. Shallow wells constructed for 10no. Community groups (women,youth groups and self help groups) have assisted 36 villages , 900 households access safe water reaching out to 9100 community members and supporting at least 10 schools in various villages and 7market centers.

5.1.4 Spring protection & construction

The project constructed and protection 10no. Springs for the target communities through community participation.The springs protected provide adequate safe water for communities. In addition the target villagers involved in spring protection were given vegetable production seedlings for food production. Some villages got tissue banana seedlings to enhance food security10no. Spring water points completed are supporting 39villages,2,602 households including 20 schools and 3market centers

5.1.5 Fish farming for spring water points

The project initiated Fish farming component with community participation for spring water points communities. 10no. Fish ponds have been constructed and 1,000 fingerlings provided for the target communities.The initiative has been supported by the County Fisheries department. Training has been done for community to develop sustainable feeds and value addition after harvesting the fish. The incomes and livelihoods will improve once the target communities start harvesting the Fish. Over 10,000 fish will harvested thus providing communities with adequate food and income.

5.1.6 Increased Adaptation for Household Kitchen gardens

Due to the increased promotion for vegetable production. Most households have adapted the kitchen garden concept to improve sustainable food production especially for the target groups involved in project activities. In liaison with sub county agriculture department several farmers have received kits for kitchen garden promotion. The following table provides data on kitchen gardens initiatives

Table 5.1.6 Inventory of Households Kitchen Gardens

Group/village	No. Kitchen Garden
1. Nangaki Self Help Group	4
2. Nakalila B Youth Group	4
3. Mulembe Women Group	6
4. Bumula Organic Group	10
5. Upendo Women Group	15
6. Bititi Youth Group	6
7. Imani Bora Group	10
8. Wapendanao Women Group	7
9. Lunao Wajane Group	10
10. Siyengo Youth Group	5
Totals	77

5.1.7 San-plat/Ecological sanitation latrines Construction

The project is promoting household sanitation based on San plat/Ecological sanitation technology. The implementation of the household sanitation has been encouraging and has been adapted due to its linkages with agroforestry. When the latrines or pits are filled the slab is transferred to another site and fruit tree seedling are planted at the old site to utilize the waste for growth. Interested households from identified villages are trained on slab manufacture and construction. The project was piloting the concept in 2no. villages in Imani Bora and Bititi Youth Group. 60no. Households have constructed Sanplat/Arboloo latrines in the 2no. Villages are currently in use.

Table 5.1.8 Cost benefit analysis and value for money aspects for completed water and Sanitation livelihoods projects

Type of water & sanitation system	Cost per unit (Project support costs)	No. of completed facilities	Total expenditures (direct project support costs)	No. of beneficiaries	Cost per unit/beneficiary
1. Shallow wells fitted with Solar Pumping unit & drip irrigation system	535,730	10No.	5,357,300	9,100	Kshs. 589per beneficiary
2. Ferro-cement Water tanks fitted with drip irrigation system	289,000	10no	2,890,000	7,447	Kshs.388 per beneficiary
3. Spring Protection & construction	101,820	10no.	1,018,200	26,020	Kshs.39 per beneficiary
4. Fish farming	89,750	10no.	897,500	13,000	Kshs.69 per beneficiary
5. School Ventilated Improved Pit latrines	252,000	10no.	2,520,000	3,584	Kshs.703 per beneficiary
6. San plat latrines	1,433	60no. 110	86,000 12,769,000	600 59,751	Kshs.143 per beneficiary Kshs.214 per beneficiary

5.1.9 Impacts of the various water facilities and drip irrigation

The community contribution and participation at project level has been encouraging and therefore contributed to achievement of the project targets on physical development of water points and installation of drip irrigation systems. The hand dug wells completed in the project areas have provided community members with access to safe water for domestic use and livelihoods opportunities via vegetable production and tree nurseries development. Schools have been able to access safe water from the completed tanks hence reduction in time for fetching for school children and the initiation of school feeding programs in schools' due to vegetable production via drip irrigation. Also reduction in water related diseases in schools and high enrolment of school children.

Due to improved sanitation via Effective Micro-organism technology girl child enrolment has improved and also improved academic performance due to reduction in absenteeism.

Some schools approached project staff and community resource persons requesting for assistance to have similar project implemented in their schools. The water points are frequently receiving visitors from county Government who are keen to learn the technologies being used to improve food production. Most of the schools benefiting from the drip irrigation have developed school agriculture learning i.e. SMART agriculture concepts based on the drip irrigation. Some schools are able to sell extra vegetables to cater for needy students needs in school i.e. Kimaeti primary school. Also socioeconomic status of the community groups have improved with some groups setting multiple use water projects i.e. poultry and dairy cows project for group members thus widening their income base and securing organic fertilizer for sustainable farming.

The project initiated the Fish farming for community groups with spring water points. 10no. Fish ponds have been constructed through community participation and have been filled with 1,000 fingerlings each. The Fish farming component is meant to improve incomes and livelihoods of the community through fish farming.

5.1.10 Appropriate Technology

The use of solar pumping system for shallow wells has reduced the burden of lining or queueing for water at the various water point sites. The water is pumped as early as 7.00am as long there is sun hence pump water to the storage tanks of 5,000 litres capacity. The water is adequate for domestic use by the community and for drip irrigation for food production. Due to this system the groups have expanded their gardens to include other crops i.e. indigeneous vegetables,water melons

Construction of Ferro-cement tanks in schools and fitting them with drip irrigation has also provided opportunities for schools to access safe water and food production. Construction of the Ferro-cement water tanks mostly uses sand which widely available in the project area hence easy for schools and community replicate the technologies. Appropriate technologies have been adapted for most of roof catchments for schools' water projects. Community members develop sense of ownership during the construction due to their involvement in providing labor and local materials. Ferrous-cement water tank technology has been adapted easily due affordability and use of local materials.

The project has developed operation and maintenance manuals to facilitate community to construct, enhance effective use and sustainability of the water Points-Ferrous-cement water tanks , hand dug wells and spring protection.

San-plat sanitation technology has been adapted by communities to enhance sanitation coverage. The project has done well to introduce the technology at village level for household sanitation. Eventual community replication will be achieved with time in the neighboring villages.

The use of effective Micro-organism Solution for schools' sanitation improvement has reduced the cost demolishing pit latrines when filled up. The Effective Micro-organism solution dissolves the waste in the latrines and ensures latrines are clean free from flies, smell and worms. Schools have saved funds since EM application clears and dissolves the waste.

5.1.11 Networking and Collaboration with stakeholders &partners

Good working relationship has been noted with the various institutions at county levels hence providing adequate support in key technical aspects during implementation. The agriculture department at sub county level has been proving capacity through their staff and trained community resource persons to scale up adaptation of households' kitchen gardens and application of conservation agriculture and organic farming.

The County Fisheries department has been supportive in setting up of the Fish farming components for the spring water points. Fish farming has been accepted by the spring water points as part of their income generating and livelihoods activity. Training was carried by Fisheries officers for community to formulate feeds and value addition so that they can undertake sustainable fish farming on their own. The project provided support by provision of fingerlings ,initial feeding and capacity building on groups involved in fish farming.

6.0.0 PROJECT IMPACTS IN RELATION TO MILLENNIUM DEVELOPMENT GOALS(MDG'S)

6.1.1 The Millennium Development Goal 7: Ensure environmental sustainability –Target 10 of the MDG 7:

Halve by 2015 the proportion of people without sustainable access to safe drinking water and sanitation (Improved water supply includes the following; Household connection, public stand pipes, boreholes, protected dug wells, protected springs and rain water harvesting/collection)-Improved sanitation includes the following; connection to sewer, connection to septic tank, pour flush latrines, simple latrines-San plats and ventilated improved pit latrines (VIP)

6.1.2 The incidence of water-related diseases is directly relevant for improvements in the health situation (MDG 4: Reduce child mortality, MDG 5 Improve maternal health and MDG 6: Combat HIV, AIDS, malaria and other diseases) and has an impact on school attendance (reduced time and health constraints for attendance due to improved water supply and sanitation services).

6.1.3 The time saving potential of improved services for women and children (both directly in terms of reduced transport time and costs, and indirectly in terms of time for caring for sick family members) can contribute not only to the education goal (MDG 2) but also to improving chances for participation in development by engaging in income-earning activities (MDG 1).

6.1.4 The provision of adequate water and sanitation services furthermore has positive impact on the general health and nutritional situation. Research studies show that frequent and severe cases of diarrhea have negative impacts on nutrition and that home produced food—such as vegetables, eggs, milk and meat—is related to the availability of land and water.

6.1.5 Providing for effective and sustainable water supply and sanitation services requires adequate governance structure and includes a commitment to good governance (MDG 8).

6.1.6 Sanitation is enshrined in the Millennium Development Goals and is a cornerstone of the fight against poverty. Lack of basic sanitation puts millions of lives at risk and is responsible for a quarter of all child deaths in developing countries every year. Lack of sanitation and poor hygiene also severely limits the impact of other development interventions in education, health, rural and urban development.

7.0.0 PROJECT IMPACTS BASED ON SUSTAINABLE DEVELOPMENT GOALS

7.1.0 Sustainable Development Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

The project provision of food production via drip irrigation address the sustainable development goal 2. The 30no. water points constructed will address these challenge adequately.

10no. Fish farming initiated around the spring water points will provide adequate food and livelihoods for community members involved.

7.1.1 Sustainable Development Goal 7: Ensure access to affordable, reliable, sustainable and modern energy

The project utilization of solar pumping system is based on affordable, reliable and sustainable energy application for enhancing water access. Through development of operation and maintenance manuals community will carry out preventive maintenance to ensure effective use of the water point facilities

8.0.0 OTHER KEY PROJECT IMPACTS

8.1.0 The community in the project areas reported saving time for fetching water hence able to undertake livelihood economic activities and also able to save funds due to use of household kitchen gardens.

- 8.1.1 **The Dublin Principles emphasizes on the need to involve women in water management as follows: Principle No. 3 - Women play a central part in the provision, management and safeguarding of water** “This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women’s specific needs and to equip and empower women to participate at all levels in water resources program, including decision-making and implementation, in ways defined by them.
- 8.1.2 **The project has promoted the role of women in water access and livelihoods through participation in project initiating, development and management.** The women groups are now scaling up to undertake forest livelihoods as they broaden their livelihoods options. All the 30no. water points have active women leadership and have shown resilience in effective implementation of project activities
- 8.1.3 **Replication of sanitation and hygiene improvement solutions i.e. EM-Effective Micro-organism** solution has been noted in all the target schools in the project. All the schools are procuring additional EM solution on their own to use in cleaning their old latrines and degradation of waste in the old latrines hence hygiene improvement and increased access to improved sanitation in schools.
- 8.1.4 **Increase awareness on water and sanitation needs.** Communities are able to prioritize their water and sanitation needs on their own.
- 8.1.5 **The community in the project areas reported saving time** for fetching water hence able to undertake livelihood economic activities.
- 8.1.6 **That there has been reduction in diarrhea disease** occurrence in the various communities due to access to safe water, improved sanitation and hygiene promotion activities.
- 8.1.7 **Increased enrollment especially for the girl child has been noted in primary schools that received assistance of water and sanitation facilities through KUMEA support.** The burden of fetching water for Girl has been reduced since the schools have water for preparation of school feeding programs and also improve access to sanitation facilities via the new Ventilated Improved Pit latrines
- 8.1.8 **The provision of sanitation facilities to some schools** i.e. St.Kizito Mayanja Secondary School and St. Joseph Bukirimo Secondary schools saved the schools from closure by public health authorities due to inadequate sanitation facilities. Latrines for both schools had been in poor state and wanting hence the need for better facilities when the project intervened to construct sanitation facilities.

8.1.9 **The Dublin Principles emphasizes on the need to involve women in water management as follows: Principle No. 3 - Women play a central part in the provision, management and safeguarding of water** “This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women’s specific needs and to equip and empower women to participate at all levels in water resources program, including decision-making and implementation, in ways defined by them.”

9.0.0 KEY CHALLENGES

9.1.1 Slow pace of community contributions in some communities and prevailing poverty levels.

Poverty levels are high in some of the project areas therefore the community capacity to raise the local available materials is quite challenging given that they have other competing needs in the homes. The project rationale is to reach the poor yet in this case cannot afford the required materials hence delay in starting and completing the planned project activities.

9.1.2 Unmet community needs and demands

The community has various needs that have not been addressed adequately. In some areas the demand for water and sanitation facilities is quite high that the project is not able to address the demands in time. As the project comes to completion or phase out period addressing the unmet demands has proved to be a major challenge due to overstretched project resources and the time limitation.

10.0 CONCLUSIONS

10.1.1 Good collaboration at community level and other key stakeholders

This is based by the level of community participation at community level with other stake holders enabled the projects to be implemented on schedule. Public health department provide support promotion of village level sanitation by facilitating with project staff community led total sanitation. The Ministries of Education and water officials have provided adequate support to the various project activities from inception to completion.

10.1.2 Community management for water and sanitation facilities

All the water and sanitation management committees have been adequately trained in various aspects for effective use and sustainability of the projects therefore the communities are able to undertake village level operation and maintenance of the water points with minimal external support. Operation and maintenance manuals have been developed to enhance effective sustainability.

ANNEX 1: PROJECT PHOTOS



1.0 Project Orientation for Bumula Sub-county at Project Inceptionn



2.0 Community Participating in Participatory Mapping Exercise during Participatory Rural Appraisal Process for Bumula sub-county at Myanga Market Center



3.0 Manufacture & production of culverts for hand dug well construction and development



4.0 Completed Lunao Wajane hand dug well in use by the community members



5.0 Completed Bititi Youth Group Hand dug well in use by community members



6.0 Completed 30,000litres Ferro-cement Water tank at St. Kizito Mayanja Secondary School



7.0 Completed 30,000litres Ferro-cement water tank for St. Peters Siboti Secondary School



8.0 Completed Namusasi Protected Water Spring being used by Community members



9.0 Completed Kibachenje Protected Water Spring in use by Community members



10.0 Completed Msituti Protected Water Spring being used by Community Members



11.0 Completed Ferro-cement Water Tank at Kimaeti Primary School



12.0 Completed 1no. 4door Ventilated Improved Pit latrines at Nakalila Primary School, Bumula Sub county



13.0 Completed 1no. 4door Ventilated Improved Pit latrines at Kimaeti Primary School



14.0 Completed hand dug well fitted with solar pumping system at Bumula Organic Women Group being used by community members



15.0 Fish pond prepared and managed by springs water user committee with 2,000 fingerlings at Muricho spring as part of water livelihoods



16.0 Fish pond prepared and managed by Spring Water User Committee with 2,000 fingerlings at Kikwasuni spring protection water point as part of water livelihoods



17.0 Completed Namwetunde protected spring Water being used by community members



18A Munyolo Spring before construction & protection



18B Munyolo Spring after construction & protection



19.0 Conservation Agriculture training for target communities &villagers as part of sustainable Agriculture capacity building



20.0 Farmers Groups being oriented on use of various farm tools &equipment for Conservation Agriculture



21.0 Community members receiving orientation on trans-planting of Tissue -banana in target villages



23. Group members transplanting tissue banana seedlings on their farms as part of sustainable food production & sufficiency



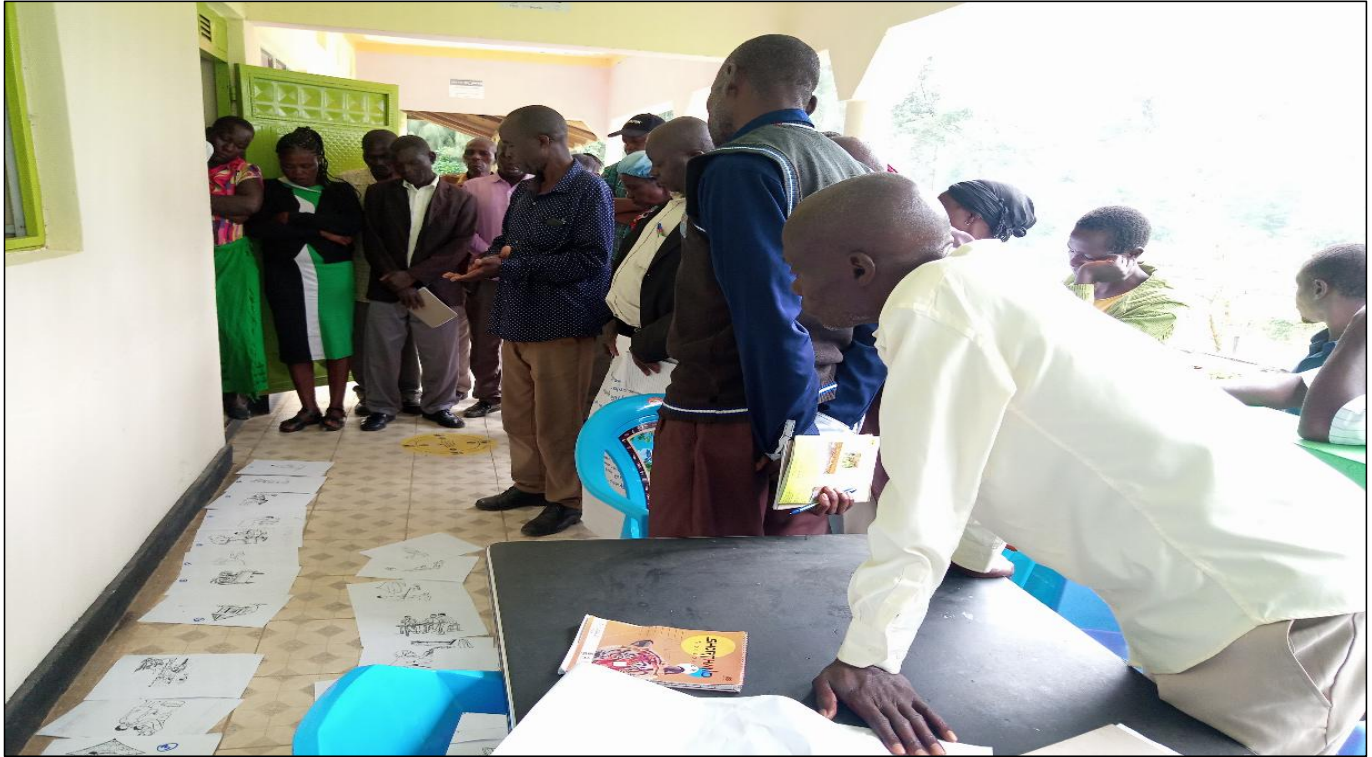
24. Group members transplanting tissues banana seedling in their farms as part of sustainable food production & sufficiency



25.0 Namwetunde Farmers Group ready to start transplanting tissue banana seedlings in their respective farms as part of project sustainable food production & sufficiency plans



26.0 Quarterly Review Sessions with project participants, stakeholders and other local leaders to review project progress and plan activities as part of participatory Project Monitoring process.



26.0 Group discussion on hygiene and sanitation during the Water Resource Management for Spring water points at Forest Resort ,Nambaya Market in Bungoma Town.



26. Plenary Presentations by participants during the Water Resource Management Training for hand dug wells and Ferro-cement water tanks water-points at Paradise hotel,Kimaeti Market.



27.0 Completed 1no. 4door Ventilated Improved Pitl latrines at St.Kizito Mayanja Secondary School



27. Completed 1no. 4door Ventilated Improved Pitl latrines at St.Joseph Bukurimo Secondary School



28.0 Kitchen garden at Imani Bora hand dug well water point for use by household members



29.0 Project Officer providing orientation and training to students and teachers of St. Kizito Masielo Secondary school on operation of the drip irrigation kit and system for vegetable production as part SMART agriculture concept



30.0 Vegetable Production farm at Wapendanao Women Group hand dug well -fitted with drip irrigation system



31.0 Community members planting cassava seedlings as part of sustainable food production & sufficiency at Bititi Youth Group water point site

ECOLOGICAL /SANPLAT HOUSEHOLD SANITATION DEVELOPMENT PROCESS



31.0 Community members participating in slab manufacture for Ecological sanitation/SANPLAT Households latrines development



32.0 Slabs manufactured and curing awaiting to be transported to households for SANPLAT Latrine construction & development



33.0 Preparing latrine pit & site for SANPLAT slab latrine construction



34.0 Mounting of SANPLAT slab on the pit ready for superstructure construction of the Ecosan latrine



35.0 Superstructure latrine construction with bricks and mud mortar



36.0 SANPLAT/Ecosan latrine ready with door and roof fixed ready for use by households