

VILLAGE ECOLOGICAL SANITATION TRAINING & ORIENTATION FOR WESTER LIVELIHOODS PROJECT

Improvement of the sanitation coverage and hygiene practices in Bumula Sub-county.

Report Prepared by : Bernard Keya, Development &Sanitation/Peter M.Okaka, Programs Coordinator-KUMEA

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KUMEA REPORT

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1.0 Executive Summary

Sanitation is vital to health, child development, social and economic progress. Without it, we cannot fulfil child rights, and good physical, mental and social well- being is unattainable. Sanitation was recognized as a distinct right by the United Nations General assembly in 2015. In that year, member states committed to the 2030 agenda for sustainable development, including targets 6.2 of the sustainable development Goals which states that " By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end pen defecation, paying special attention to the needs of women and girls and those in vulnerable situations."

It is on this back drop that KUMEA developed a village sanitation training program to foster hygiene practices and sanitation improvement in Bumula Sub-County. The village sanitation training was conducted for two groups namely; Imani bora and Bititi self-help in Bumula Sub County from 29th June2023 to 14th July,2023. Thirty members participated from each group. During the training, participatory tools were applied to generate discussions among members and guide in developing plan of action. These included; sanitation mapping, Sanitation ladder, F- diagram and barrier methods.

This training out lined the importance of the following,

- Recognizing the routes of faecal contamination and being able to link safe water and hand washing in breaking the cycle of faecal contamination.
- Understanding and knowing the target home steads to focus when improving household sanitation in their villages.
- Identifying together with household members, small "do-able" actions, feasible and effective behaviours based on their current context.
- Constructing and improving traditional latrines from local materials that meet minimum standards.
- Collecting information on number of latrines constructed and in use
- Conducting community mobilization and sanitation campaigns.

The discussions held with the participants revealed the following as tabulated below;

#	Behaviour/ Practice	Imani Bora	Bititi youth
		Site/village	Site/village
1	Those using Good latrines	5%	35%
2	Those using latrines but with temporary maintained slab	5%	
3	Those using latrines with poorly maintained slabs	70%	60%
4	Those without a latrine and using open fields	20%	5%
5	Those having hand washing stations	0%	0%

Some of the reasons advanced for poor excreta disposal included;

- The availability of bush as an alternative disposal point
- Traditional beliefs that forbids sharing a latrine with some members of the family.
- Loose soil formation in some areas
- Laxity of some members in constructing latrines.

Members were able to come up with working groups of ten people each that will be helping each other to construct latrines for ease of monitoring.

During mapping exercise, it was revealed that villages are well endowed with bricks, stones and sand. This will ease the construction costs and enhance the sanitation improvement.

Local construction technology using bricks bonded with mad is available. The members will adopt this method to build latrine superstructures which will construction costs during the transfer of materials to newly constructed pits after filling the old ones.

The participants appreciated the simplicity of the san-plat technology and resolved to sell the idea and practice to non-participating villages.

The village sanitation training has provided knowledge and skills to the group members to be able to construct and improve latrines in their villages. The training has enhanced their capacity to mobilize the community towards hygiene practices and monitor progress in sanitation improvement.

2.0 Background to improved hygiene and Sanitation

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.1 Lack of sanitation and poor hygiene also severely limit the impact of other development interventions in education, health, rural and urban development.

An enormous amount of resources has been expended on providing sanitation facilities, yet still over 2.5 billion people do not have access to basic sanitation services (WHO/UNICEF - JMP, 2008). Throughout the developing world the low sanitation coverage figures paint a stark picture. Furthermore, sanitation hardware alone is not sufficient: in many instances even though new toilets and washing facilities have been built, and coverage is recorded by officials as relatively high, proper usage remains low and little or no benefit is derived. Indeed, awareness is growing amongst public health practitioners that, until hygiene is properly practiced, both at home and in the community as a whole, the desired impact of improved water and sanitation services in terms of community health benefits cannot be realized.

Over the past four decades' practitioners have strived to find ways to reduce not only the huge number who remain without access to a toilet but also the huge number who do not use facilities hygienically even when they are available. The methods used to address this problem endeavor to engage target groups (individuals, households, communities, institutions or even organizations) in development programs that enable a change in behaviors or create a demand for services. These methods or approaches are generally referred to as "software" activities to distinguish them from the provision of hardware.

3.0 What are hygiene and sanitation?

The terms *hygiene* and *sanitation* can mean different things to different people. For the purposes of this exercise the term 'sanitation' is used to refer to the management of human excreta. The term *hygiene* is used to refer to the behaviours/measures, including but beyond the management of human faeces, which are used to break the chain of infection transmission in the home and community. Whereas most people recognise that hygiene means 'handwashing', there is some confusion as to what else is involved. In reality, all of the following contribute in some measure to reducing the burden of infectious diseases circulating in the community:

- Hand hygiene and personal hygiene;
- Food hygiene (cooking, storing, preventing cross contamination);
- Ensuring safe water at 'point of use';
- Respiratory hygiene;
- Safe disposal of faeces (both human and animal);
- General hygiene (laundry, surfaces, toilets, baths, sinks); and
- Disposal of solid waste, control of wastewater and rainwater

Although ideally all aspects of home hygiene are important, there is a general consensus that hygiene promotion programs are more likely to be successful in changing behavior if they focus on a small number of activities at a time. This means understanding how infectious diseases are being transmitted, and prioritizing practices which carry the greatest risk:

In communities where facilities for safe disposal of faeces are inadequate, the major part of the **diarrhoeal disease** burden originates from infected faeces. Infectious agents are transmitted from faeces to hands to mouth (which can occur directly, or indirectly via other surfaces e.g. toilet surfaces), or by consumption of food or water which has become contaminated with faecal organisms. **'Faecal oral' transmission is illustrated by the F-diagram shown in the image above.** Breaking the chain of faecal-oral transmission is achieved by a combination of improved sanitation and good hygiene practices. Animal faeces can also be the source of diarrheal disease, as can contaminated food purchased from a market or a contaminated community water supply

Other hygiene practices such as **improved food hygiene** and **solid waste management** are important as well; practitioners generally introduce these once the three primary interventions are in place. Of course the ranking of risks may vary from one community to another, for example in some communities' risks associated with poor food hygiene may be greater than those associated with poor household water quality.

4.0 Ecological Sanitation & Criteria

Human faeces, not urine, are responsible for most diseases spread by human excreta. Thus, a method is needed to sanitize faeces. Two methods are discussed in this book: dehydration and decomposition. Dehydration, or drying, of faeces is easier if they are not mixed with urine and water. When faeces decompose, the different living things in them die and are broken down into smaller parts. Thus with either method germs, eggs and other potentially unsafe, living things are made harmless. It is only then that faeces can be safely recovered and recycled. (The terms dehydration and decomposition simply indicate which conditions are predominant, Key features of eco-san are prevention of pollution and disease caused by human excreta, treatment of human excreta as a resource rather than waste, and recovery and recycling of the nutrients. In the natural world, excreta from humans and other animals play an essential role in building healthy soils and providing valuable nutrients for plants. Conventional approaches to sanitation misplace these nutrients, disposes of them and break this cycle.

The criteria needed to achieve a new vision are simple, but achieving the vision requires a change in how we think about sanitation. The challenge addressed is to offer a sanitation system that contributes to this new vision, including constraints. The criteria for Ecological Sanitation is a key determinant of both equities in society and society is ability to sustain itself. If we cannot meet the sanitation challenge described above, we will not be able to provide for the needs of the present generation without hindering that of future generations. Thus, sanitation approaches must be resource minded, not waste minded. Similarly, there can be no equity as long as half the world's population goes without even basic sanitation. A system of sanitation that contributes toward these goals (equity and a sustainable society) must meet or at least be on the way towards meeting the following criteria.

- a) Prevent disease: A sanitation system must be capable of destroying or isolating faecal pathogens.
- b) Affordable: A sanitation system must be accessible to the world's poorest people.
- c) Protect the environment: A sanitation system must prevent pollution, return nutrients to the soil, and conserve valuable water resources.

- d) Acceptable: A sanitation system must be aesthetically inoffensive and consistent with cultural and social values.
- e) Simple: A sanitation system must be robust enough to be easily maintained with the limitations of the local technical capacity, institutional framework and economic resources.

5.0 Introduction:

Village Ecological sanitation training was done in 2 villages in Kimaiti ward, Bumula sub-county from 29thJune, 2023 to 14th July, 2023. Participants were members from two self-help groups namely; Imani bora and Bititi Youth group. Thirty people were trained from Iman bora group and thirty people from Bititi youth group.

6.0 Training Objectives:

The main objective of the workshop was to promote sanitation coverage as an integral element in WASH.2.0

Other objectives included participants being able to;

- Recognize and describe rotes of faecal contamination.
- Understand and know the home steads to be targeted in improving household sanitation in their villages.
- Explain the importance of safe excreta disposal, safe water and hand washing in breaking the cycle of faecal contamination.
- Identify together with household members, small d0-able actions, feasible and effective behaviours based on their current context.
- Construct and improve traditional latrines from local materials that meet minimum standards.
- Collect information on number of latrines constructed and in use
- Develop action plan or the next three months to conduct community mobilization and sanitation campaigns.

7.0 Training Agenda for each of the target villages:

Preparing groups in Bumula for total behaviour change in hygiene and sanitation.

Time Frame/period	Morning session	After-Noon session
Day One	Sanitation mapping	How diseases spread.
	Choosing sanitation	Breaking the cycle of contamination
	improvement	
Day Two	Demonstration on san-plat slab	Demonstration on san-plat slab making
	making	
Day Three – Five	Slab manufacture and curing	San-plat slab manufacture and curing
Day Four- Eight	Demonstration on pit pegging	Demonstration on pit pegging and
	and digging	digging
Day Nine – Ten	Pit lining and slab placement	Pit lining and slab placement

The findings and outcomes from this workshop have enabled the training team to learn and appreciate household situations as pertains to hygiene and sanitation practices. The team saw the need to involve all community members and other stake holders in facilitating the adaptation of best practices in sanitation and hygiene behaviours.

8.0 Training process and methodology:

The methodology used during the training involved the use of participatory tools for generating discussions among the participants and demonstrations to allow participants have a feel of the construction works.

The training was done in four units;

- 1) Introduction to participatory monitoring and evaluation: Using the participatory mapping exercise and sanitation ladder, participants were able to establish sanitation status and visualize the desired goal.
- 2) Introduction to the cycle of faecal contamination and the importance of safe excreta disposal, safe water and hand washing in breaking the cycle of faecal contamination.
- 3) Tools and techniques for changing hygiene behaviours at the house hold level.
- Sanitation ladder
- F-diagram
- Barrier methods.
- 4) Demonstration on latrine construction
- San-plat slab making
- Pit pegging and lining
- Slab placement
- Superstructure construction

9.0 Participatory mapping

Purpose:

To define together with the community, the boundaries of their villages and latrine status. Village mapping was used to facilitate the understanding and discussions on latrine use, available local resources and the social aspects of sanitation.

Two maps were drawn by the two groups. The outcomes from the maps were similar since the villages are relatively close to each other. The findings from the map were as follows;

- In all the villages, sanitation coverage was very low. The discussions revealed that some of the reasons for not using the latrines are the close proximity to bush as an alternative defecation site, loose soil formation in some parts, hard formation in other areas, social aspects and laxity.
- Local resources available included the sand, hard-core, bricks and grass.
- The existence of local knowledge in building houses using bricks bonded with mud will play a key aspect in reducing construction costs of latrines.
- The bigger parts of the population have latrines that are not user friendly. The slabs are temporary with multiple apertures posing public health risks to the users.
- Termites are contributing to low sanitation coverage since they eat up the poles used for the slabs making it collapse. With the introduction of the San-plat slab, this will be a permanent solution.
- In some homesteads, parents cannot share latrine with in-laws. With the principle of simplicity on making and use of the san-plat slab, such home steads can provide two latrines to accommodate all members.

The table below indicates the sanitation levels in the villages.

#	Behaviour/ Practice	Imani Njema	Bitti Youth
1	Those using Good latrines	5%	35%
2	Those using latrines but with temporary maintained slab	5%	
3	Those using latrines with poorly maintained slabs	70%	60%
4	Those without a latrine and using open fields	20%	5%
5	Those having hand washing stations	0%	0%

10.0 Choosing sanitation improvements;

Purpose: To help participants to describe the community's sanitation situation and identify options for improvement. This also aimed at helping participants to appreciate that improvements can be made step-by-step.

Using the sanitation ladder tool, participants agreed on what they perceived as the worst sanitation option to the best.

This exercise confirmed the facts that were expressed during the mapping exercise, that most of the homesteads are having latrines with poorly maintained slabs.

Open defecation is a common practice.

Participants appreciated that there are advantages and difficulties that they might meet in trying to move to different steps of the ladder. These included the following;

#	Advantages	Difficulties
1	Improved dignity and status in the	Loose soil formation in some areas
	community	
2	Reduced cases of diseases	Termites will spoil the poles for the slabs
3	Environment will be clean	The value attributed to latrine use by some
		homestead members
4	Water contamination will be reduced	
5	Improved nutrition status due to	
	reduced diarrheal diseases.	
6	All family members will be access safe	
	excreta disposal	

Of important to note, participants were able to understand the cost implications of different latrine design option and came up with appropriate design in their context. Bricks and stone were the preferred material for pit lining, while bricks and iron sheets were the preferred materials for the superstructure construction.

Steps in latrine construction were outlined and participants appreciated the san-plat as an appropriate option for safe excreta disposal in the area.

Using the construction steps, participants were able to dive in groups of ten people to share tasks in latrine construction.

The groups resolved to move slab making sites to appropriate areas agreed by the sub groups for convenience.

It was noted that the groups should take and initiative to involve community health workers to enhance mobilization for latrine use and construction.

11.0 How diseases spread:

Purpose: To enable community members discover and analyse how diarrhoeal diseases can be spread through the environment.

Participants used the faecal oral route diagram to generate ideas on how people get diarrhoeal diseases from open defecation.

It was noted that diarrheal diseases are generally spread by;

- Eating food or drinking water is contaminated with human faeces.
- Feeding children with dirty hands.
- Putting dirty objects in mouths.

The figure below summarises the transmission routes of diarrheal diseases;



F-DIAGRAM DEPICTING CONTAMINATION ROUTES



F-DIAGRAM ILLUSTRATION



12.0 Preventing the transmission:

Purpose: To help participants discover ways to prevent or block diarrheal diseases from being spread through the transmission routes identified.

Using the previous F- diagram, participants appreciated that it was their responsibility to prevent disease spread by blocking the transmission of germs.



It was emphasised that good sanitation is a combination of facilities and behaviours. The following three key hygiene behaviours lead to the greatest reduction of diarrheal diseases;

- Safe disposal of faeces, particularly those of babies, young children and people with diarrhoea.
- Hand washing, after defecation, after handling babies' faeces, before feeding and eating, and before handling food.
- Keep drinking water free from faecal contamination, in the home and at the source.

Participants discussed and understood how transmission occurs. This helped them to identify the different ways to block the transmission routes. They weighed the disadvantages and advantages of blocking the routes in their households, considering whether it will involve a lot of trouble, time and money. What will be the benefits and if it will be worthwhile.

Three activities in the training were emphasised that build around this understanding;

- Good and bad hygiene behaviours help to examine their existing behaviours
- How diseases spread and
- Blocking the spread of diseases help them to understand how transmission takes place and how it can be prevented.



DIAGRAM FOR FAECAL TRANSMISSION PREVENTION & BARRIERS



DIAGRAM FOR FAECAL ORAL TRANSMISSION PREVENTION MEASURES

13.0 Latrine construction:

For the purpose of this training, latrine construction was divided in to the following steps.

Latrine siting: During the discussions, it was noted that socially, latrine siting affects the use. Before the site is determined, all homestead members' needs to agree that the venue is convenient for all users.

Pegging the pit: Participants discussed various tools for pegging a latrine pit which included use of a sack, tape measure or rectangular frame. By having a menu of these tools, homestead members will be able to choose the most appropriate for them to peg pit latrines. The pit which measures 1.5 metres square is dug to remove the subsoil and lined. After lining, the pit is reduced to 80cm square, which is dug up to the owner's convenience.

Pit Lining: The pit is lined after removing the sub-soil, and the lining materials remain in place while deepening. This is to help maintain the shape of the pit to avoid widening when removing the soil. Lining can either be done using bricks or hard-core which are readily available. During the lining demonstrations, it was noted that lining with bricks takes 48bricks. Hard-core equivalent to one wheel barrow does the work.

Slab placement: Before placing the slab on the pit, a mixture of soil and cow dung is placed on the lining materials to receive the slab. The mud mix helps to stabilise the slab and eases the removal of the slab when transferring to the new pit.

Superstructure construction: The superstructure is made using any available materials. This will depend on the choice of the home stead members. The superstructure materials range from the bricks, GI sheets, Reeds, grass and mud. The door may be made of a sack, wooden or GI sheets.

14.0 Slab Making: The program supports the use of San—Plat slab in proving pit latrines due the following properties;

- 1. **Simplicity:** San-plat slab is simple to make. Community members do not have to rely on skilled artisan to make one. Local tools like old hoes, pangas and straight edge wood can be used. The ground is used as a mould.
- 2. Affordability: The slab is relatively affordable. One bag of cement produces three slabs. One reinforcement bar I used in four slabs. Community members can therefore came together in groups of three and share the resources.
- 3. **Replicability**: San-plat slab is easily replicable. The materials needed to manufacture one are small in quantity ie; five tins of 2kg size of cement, 10 tins of sand and 15 tins of ballast are enough to make one slab. All group members have the skill and practice in making the slab. This provides a capacity to make the slabs in the village depending on the community demand.
- 4. **Sustainability:** The size of the slab makes it easy to be transferred to a new pit. The slab finish is made slanting towards the centre. This make it easy to clean as it is self-cleansing.

15.0 The slab mix: This slab is mixed to the strength of 1:2:3. This is to say, one batch of cement to two batches of sand to three batches of ballast. For the purpose this activity, a two kilogram tin was used as a measuring batch.

The casting area is levelled by removing the subsoil to get a firm ground. The size of the slab is measured, and soil is removed up to 4cm. This provides the thickness of the slab. Leaves are laid to stop cement grout from seeping to the ground. A concrete mix of ratio 1:2:3 is then poured in the mould, rammed to level. A floor screed made of ratio 1:1cement -sand is applied to the slab to make a monolithic layer and finishing. A straight edge wood is used to maintain the slanting surface of the slab. The slab is then cured for seven to fourteen days before use.

For hygiene purpose, the aperture is smoothened using a polythine paper, to ease cleaning. The aperture is key shaped whose length measures 400 mm. This allows urinary trajectory to be directed to the pit. The smaller are of the key shape provides a squatting area for the children and hence the latrine is user friendly for both children and adults.

Foot rests on the slab are not necessary as they will compromise its hygiene. However, if the members need it, then it should not be higher than 1.5cm.

16.0 Demonstrations: Demonstrations were done to make the community have a feel on the construction works and develop confidence in applying the materials. The demonstrations were done on pit pegging, pit lining, slab placement and superstructure building. The participants appreciated simplicity and use of the latrine components. Of importance to note is the confidence participants have in pit lining and slab placement.

17.0 Key Recommendations:

- Monitoring of the progress of sanitation is important. The groups were advised to develop a monitoring chart to be used to monitor the steps in latrine construction. The records can be shared in the lager groups during quarterly review and planning meeting.
- Latrine construction and use will be effective in stopping open defecation if they are coupled with hygiene messages. The groups should be linked with area community health volunteers to enhance hygiene promotion.
- It was observed during mapping exercise that proximity to bushes provides alternative method of excreta disposal. The group will need close follow-up of the manufactured slabs to ensure that they have been used effectively.
- During the training key hygiene messages were emphasised. Hand washing at critical times was among the messages promoted. The programme needs to initiate hand washing stations as a back up to the messages.
- Sanitation campaign weeks are essential in sensitizing communities in providing and using latrines. The program will need to enable the groups participate in observing world toilet days to increases the latrine coverage.
- Homesteads without latrines pose health risks even those members using latrines. The program will need to put in place mechanism to facilitate communities neighbouring the target groups to use latrines.
- Water sites in the project area are meeting venues for most of the community members. These areas may be used to disseminate hygiene messages to the community for effective use of the water and sanitation facilities.

ANNEX 1: PHOTOS FOR THE ECOLOGICAL SANITATION TRAINING SESSIONS



1.Community members from Imani Bora village in discussions of Sanitation ladder exercise for sanitation promotion



2. Community members discussing faecal oral routes and barriers at Imani Bora village



3.0 Participatory Mapping exercise at Imani Bora village to determine sanitation coverage in the village.



4.0 Community members preparing site for slab casting at Imani Bora Village



5.0 Community preparing local ballast for slab casting at Imani Bora village



6.0 Preparing site for slab casting at Bititi Youth group village



7.0 Preparing latrine site for mounting of slab for latrine construction



8.0 Mounting of SAN PLAT slabs ready for latrine construction at Imani Bora Village



9.0 Community members casting SAN PLAT slabs for latrine construction



10.0 Demonstrating how to prepare the foundation wall for SAN PLAT slab mounting & latrines construction in Sinoko village for Bititi Youth Group members



11.0 Community members at Imani Bora site making SANPLAT slabs at their water point site.



12.0 Women participating in preparing concrete mix for SANPLAT Slabs casting for Ecological Sanitation latrines



13.0 Community participation in development of households SANPLAT slabs for Ecological Sanitation latrines at Imani Bora water point site



14. SANPLAT slabs manufactured by community members of Imani Bora water point being cured ready for latrines construction at households' level.



15. SANPLAT/Ecological Sanitation household latrine under construction in Imani Bora women group village



16. Completed SANPLAT/Ecological sanitation household latrine ready for use by households in Imani Bora /village site

ANNEX 2: LIST OF PARTICIPANTS DURING SANITATION DEMONSTRATION & TRAINING IN THE 2NO. VILLAGES 1.0 BITITI YOUTH GROUP WATER POINT SITE PARTICIPANTS

NAME OF PARTICIPANT	VILLAGE	LOCATION	GROUP
1. Christopher Khisa	Sinoko	Napara	Bititi Youth Group
2. Ignatius Khaemba	Sinoko	Napara	Bititi Youth Group
3. George Wanyonyi	Sinoko	Napara	Bititi Youth Group
4. Joseph Khaemba	Sinoko	Napara	Bititi Youth Group
5. Douglas Khisa	Sinoko	Napara	Bititi Youth Group
6. Vitalis Khisa	Sinoko	Napara	Bititi Youth Group
7. Milton Mutunga	Sinoko	Napara	Bititi Youth Group
8. Everlyne Waswa	Sinoko	Napara	Bititi Youth Group
9. Elizabeth Nanjala	Sinoko	Napara	Bititi Youth Group
10. Metrine Simiyu	Sinoko	Napara	Bititi Youth Group
11. Leah Lukorito	Sinoko	Napara	Bititi Youth Group
12. Dorcas Waswa	Sinoko	Napara	Bititi Youth Group
13. Florence Nasibwondi	Sinoko	Napara	Bititi Youth Group
14. David Simati	Sinoko	Napara	Bititi Youth Group
15. Chirstine Sanane	Sinoko	Napara	Bititi Youth Group
16. Alice Wafula	Sinoko	Napara	Bititi Youth Group
17. Chrisostim Wanjala	Sinoko	Napara	Bititi Youth Group

NAME OF PARTICIPANT	VILLAGE
1. David Wachana	Khasolo C
2. Joan Wanjala	Napara
3. Doris Waswa	Sinoko
4. Eliud Wafula	Napara
5. Sakina Hassan	Khasolo c
6. George Okumu	Sinoko
7. Emily Musungu	Lurare
8. Benson Juma	Khasolo A
9. Sammy Makhanu	Khasolo C
10. Jared Wafula	Sinoko
11. Elias Sikuku	Lurare
12. Martin Barasa	Lurare
13. Linus Simiyu	Khasolo C
14. Ram Nalianya	Khasolo C
15. Hesbon Namanda	Sinoko
16. Nandemu Baraza	Napara
17. Everlyne Nandemu	Napara
18. Alice Namareme	Napara
19. Linda Wanyonyi	Khasolo C
20. Robert Wafula	Napara A
21. Isaac Kundu	Napara A
22. John Kinisu	Khasolo C
23. Everlyne Wakhaleli	Lurare
24. Everlyne Mutoka	Kamurumba
25. Julius Kundu	Napara
26. Modesty Khakunjwi	Khasolo C
27. David Nakhaya	Khasolo C
28. Mildred Wamalwa	Lurare
29. Elvis Ksili	Sinoko
30. Diana Oduori	Napara

2.0 IMANI BORA WATER PROJECT SITE PARTICIPANTS