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# Impact Assessment of Water, Sanitation and Hygiene program in villages of Mvomero District, Tanzania





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Funding for this publication was provided by the American people through the United States Agency for International Development (USAID) as a component of the Tanzania Integrated Water, Sanitation and Hygiene (iWASH) Program. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the United States Agency for International Development, the United States or Florida International University.

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**For bibliographic purposes, this document should be cited as:**

GLOWS-FIU. 2013. Impact Assessment of Water, Sanitation and Hygiene Program in villages of Mvomero District,, Tanzania. Global Water for Sustainability Program, Florida International University. 90 pp.



## EXECUTIVE SUMMARY

This Impact Assessment is the result of a qualitative assessment of the impact of the Tanzania Integrated Water, Sanitation and Hygiene (iWASH) Program based on a selection of case studies collected in two of the recipient villages. It forms part of the documentation initiative of the iWASH Program. **The intention of this exercise is to provide an overview of the impacts and lessons learnt from the implementation of the iWASH Program over the last three years, and capture relevant insights for similar interventions in the future.**

The impact assessment was undertaken to answer the central question:

*“in which ways and to what extent has the iWASH program brought long-term changes in health and economic resiliency (increased income, improved food security, and/or overall livelihood improvement) in the communities within the target program area?”*

A participatory and theory-based evaluation methodology was applied to collect data for this Impact Assessment. This was based on gathering qualitative information through semi-structured and conversational interviews, focused group discussions, and a workshop with selected informants. Two villages were selected from among the 8 first batch villages in Mvomero district, Kanga and Pemba Village, which represented diversity in access to markets, as well as different types of water supply interventions (rope pump shallow wells versus piped water supply systems). Wealth-based stratified random sampling was applied to select respondents, and data collected by means of semi-structured interviews. It is worth noting that groups of farmers and pastoralists are located in the studied villages and distinct farmer-pastoralist differences and tensions were revealed on the wealth indicators. For pastoralists the most important indicators of better life were livestock i.e. cattle and goats/sheep, which they own in large numbers, whilst all farmers identified housing condition and land for farming as the most important indicators.

Interview data was summarised to create ‘Most Significant Change’ (MSC) stories; and themes were coded and analysed to generate descriptive statistics and chi-square test of association. In addition, a number of livelihood constraints and opportunities that communities have experienced were identified which determined the role of iWASH interventions in helping people cope with the constraints, and/or creating livelihood opportunities. Analyses included community perception of impacts due to improved sanitation and hygiene interventions, and improved water supply. This Assessment also distinguishes impacts in different wealth categories: poorest, poor, less-poor and non-poor – characterized according to community-defined criteria.

Analysis of the MSC and interview data shows the following overarching positive consequences of the activities under the iWASH to date:

- **Improvements to coping with water scarcity and diarrhoea diseases**, both included as a major focus of iWASH Program, were identified to be among the livelihood constraints across all the wealth categories. More than 90% of the interviewees including schoolchildren testified that iWASH had helped them to cope with challenges of water scarcity and diarrhoea diseases.
- **Improved water supply** came out as an outstanding 'hub', through which much of the reported significant changes in the lives of the community members happened equally across wealth categories. **A lack of significant difference between wealth categories with regard to their engagement in water-linked economic activities could be an indication of the equitable nature of the iWASH Program interventions (or simply the fact that all people require water).** (Improved water supply was the main component through which positive impacts occurred in both domains of change, compared to VSL and sanitation and hygiene components.)
- **Improvements in livelihoods** of the people with improved access to water where the benefits were equally distributed across wealth categories:
  1. **Benefits to Health\*** (20.6% or 14 out of 68 interviewees ) achieved through:
    - i. communities refrain from drinking unsafe water once safe water was made available or adopt of improved sanitation and hygiene facilities and practices or both; and
    - ii. to a lesser extent, dependable water supplies at dispensaries, and/or health centres or both that enhanced quality health services especially for pregnant women.

\*(79% on the use of improved water supply and 21% to their adoption of improved sanitation and hygiene facilities and practices)
  2. **Improved Economy or Household Production and Income\*\*** (32.4% or 22 out of 68 interviewees) achieved through:
    - i. increased production as a result of labour saved from water fetching;
    - ii. engagement in water-based economic activities such as gardening, restaurants, food-vending and brick making or trading in commodities produced from water-linked activities; and
    - iii. access to investment capital through village savings and loan (VSL) scheme.

\*\* (of the 22 interviewed, 77% on the use of improved water supply and 14% to VSL and 9% to a combination of VSL and engagement in productive use of water)

3. **Improvement through the multiple use of water (MUS)** (32.4% benefiting from water-linked activities represents spontaneous engagement in multiple use of water (MUS)), which is likely to increase following recent stimulation through MUS interventions. This claim is justified by the several cases where interviewees reported to have failed to take advantage of increased water supply due to inadequate technical support. MUS activities are designed to provide technical support on water-linked economic activities including gardening and improved livestock keeping.

(Negative livelihood experiences reported were attributed to factors outside of the iWASH activities, however, they signified important livelihood situations which would have been important for the iWASH design process and theories of change).

- **Availability of incomes appears to be the most important determinant of adoption of improved latrines**, rather than the levels of knowledge or awareness of improved latrine technologies, or the principles of sanitation and hygiene. Thus, to the extent the findings from this study represent the livelihood scenario in rural areas of Tanzania, it could be concluded that future sanitation and hygiene interventions are likely to succeed only if they are effectively integrated with livelihood improvement interventions.
- **The presence of improved latrines at schools provided an incentive for schoolchildren to attend classes, in addition to improvements in health.** However, it did not result in positive change in education performance due to intrinsic prohibitive school factors, especially inadequate teachers and poor teaching environment.

Despite overall positive responses to the iWASH activities, four weak areas were identified by respondents relating to inadequate integration of: 1) rural health governance systems, 2) special needs of the poorest and of pastoral communities; 3) important roles played by the village governments; and 4) the philosophy of integrated water resource management at community level. Other negative responses related to:

- **A few interviewees related negative accounts concerning VSL, although often also attributed to the inadequate entrepreneurship or business skills of the relevant VSL member.** Inadequate mobilization of pastoralists and the poorest has been the major cause of the negative attitude towards VSL scheme. Even the poor or poorest VSL members who attempted to join VSL were more likely to drop out than the less-poor or

non-poor due to performance issues. Nevertheless, VSL is still better in engaging the poor and poorest in comparison to available records for other microfinance institutions such as SACCOS. This report concludes that there is a substantial problem with the way iWASH has been engaging with communities to promote VSL. The approach induces non-poor and less poor, who attend inception meetings, to apply to join the group while the poor and poorest do not apply leading to self-selection bias of the non-poor and less poor. Approaches that provide intensive VSL trainings to the overall communities prior to VSL group formation would help to bring the poor on board but more studies are still needed: **There is a need for more detailed research on who benefits, how they benefit, and on the potential for negative impacts, and how these might be mitigated in VSL approaches.**

- Communities testified as to the relevance of iWASH for addressing their genuine livelihood challenges, and/or limitations. However, from their perspective they identified the weaknesses in the iWASH program components as:
  - a) **Agriculture and livestock** keeping were the major livelihood activities in the program villages. However, iWASH program did not pay attention to interventions to improve productivity in agriculture, and/ or livestock sectors even though it envisaged to enhance economic resilience of the target communities
  - b) iWASH assumed that improved water supply would automatically enhance small **irrigation** to cope with drought, but did not invest in provision of the needed technical support to farmers. This was aggravated by the facts that there are no agricultural or livestock extension workers motivated to help the farmers.
  - c) Similarly, although iWASH provided water for livestock, pastoralists were also concerned with deterioration and scarcity of fodder, and increased incidences of livestock diseases; which were not addressed.

*[Note: iWASH has in fact piloted a range of livelihood interventions, but these started relatively late in the Program cycle, and were constrained by the funding allocation as Water for the Poor funds could not be used for these activities.]*

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## ABBREVIATIONS and ACCRONYMS

|           |  |
|-----------|--|
| COWSOs    | Community Owned Water Supply Organizations   |
| iWASH     | Integrated Water, Sanitation and Hygiene   |
| IWMI      | International Water Management Institute   |
| IWRM      | Integrated Water Resource Management   |
| JUVIHIMTU | Jumuiaya Vikundi vya Hisa Mvomero and Turiani [ <i>District Level Apex Organization for Village Savings and Loan Groups in Mvomero and Turiani</i> ] |
| MSC       | Most Significant Change  |
| MUS       | Multiple Uses of Water   |
| PRA       | Participatory Rural Appraisal  |
| UNICEF    | United Nations Children's Fund   |
| VSL       | Village Savings and Loan Scheme  |
| WaSH      | Water, Sanitation and Hygiene  |
| WUA       | Water User Association   |

## 1.0 INTRODUCTION

This Impact Assessment forms part of the documentation of the Tanzania Integrated Water, Sanitation and Hygiene (iWASH) Program initiated in 2010 with the goal: ***“to support sustainable, market driven water supply, sanitation and hygiene services to improve health and increase economic resiliency of the poor in targeted rural areas and small towns within an integrated water resources management framework”***.

The iWASH Program is expected to close-out by the end of 2013. This Impact Assessment summarizes the findings of qualitative assessment of the impacts of improved water supply, improved sanitation and hygiene, and access to village savings and loan schemes (VSL) components of the iWASH Program through a selection of case studies. The intention of this Impact Assessment is to aid the donor(s) program management, to provide an overview of the impacts and lessons learnt from the implementation of the iWASH program over the last three years to Local Government Authorities and the National line Ministries in order to provide relevant insights for similar interventions.

### 1.1 Background

The iWASH Program is a USAID-supported initiative being implemented by the Global Water for Sustainability (GLOWS) consortium under the leadership of Florida International University (FIU). The key implementing consortium organisations are Winrock International, and CARE International, supported by WaterAid, World Wildlife Fund (WWF) and other local partners and government with input from others such as target communities.

The iWASH Program Goal is to be achieved through five intermediate objectives:

- Objective1: Increase sustainable access to water supply by poor rural and small town dwellers;*
- Objective2: Increase sustainable access to sanitation and hygiene services by poor rural and small town dwellers;*
- Objective3: Increase the number and capacity of private sector entrepreneurs and businesses providing WSH services;*
- Objective4: Increase access to sustainable financing for communities and entrepreneurs engaged in WASH services; and*
- Objective 5: Increase sustainable management of watersheds and water resources quantity and quality.*

Implementation started in January 2010 and is programmed to end December 2013. Direct implementation of the Program by consortium organisations has mainly been in selected villages in Mvomero and Kilosa districts within the Wami-Ruvu River Basin in eastern Tanzania. By 2011 the iWASH program had covered the first batch of 8 villages, of which 7 villages (Bwage, Digoma, Dihinda, Kanga, Makuyu, Mziha and Pemba) are in Mvomero district and 1 village (Mvumi) is in Kilosa district. In 2012, the Program expanded its' activities with a second batch of 7 self-selected villages: Mangae village in Kilosa district, Bigwa village in Morogoro

Municipality, and five villages (Difinga, Digalama, Msolokelo, Yowe and Mangae) in Mvomero district. The final batch of 5 villages to be served in 2013 are located in the Mkondoa sub-catchment in Kilosa District.

As the Program approaches its end, it is necessary to document progress towards achievement of the specified goal, and identify lessons learnt to inform future similar initiatives. Accordingly, a qualitative impact assessment based on case studies collected from two selected villages in the first batch villages was undertaken by iWASH. This report summarizes the results.

## **1.2 Objective**

The aim was to understand and capture from a small selection of recipient villages the beneficiaries perceived outcomes of the iWASH Program, the assumptions behind their perceived outcomes and to identify any lessons that can be learned for future projects based on the beneficiaries' perspectives on what did and did not work and why.

## **1.3 Guiding impact evaluation questions**

The central question for the iWASH Program impact assessment case study was:

*“in which ways and to what extent has the iWASH program brought long-term changes in health and economic resiliency (increased income, improved food security, and/or overall livelihood improvement) in the communities within the target program area?”*

This broad question was explored through the following four sub-questions:

- i). With access to the village savings and loan scheme (VSL), what long-term positive or negative changes (if any) did occur in beneficiaries' livelihoods, and/or livelihood diversification ?*
- ii). With access to improved water supply, what long-term positive or negative changes (if any) did occur in beneficiaries' livelihoods (not just incomes) and livelihood diversification (income from off-farm activities as proxy)?*

The aim of questions 'i' and 'ii' being to unravel the current and anticipated long-term changes in livelihoods and livelihood diversification (not just incomes) This was achieved through in-depth analysis to ascertain whether different socio-economic groups experienced varying changes in terms of (a) beneficiaries reflection of themselves; (b) engagement in new but more sustainable livelihood strategies; (c) reducing dependence on less reliable/predictable resources.

- iii). To what extent has access to improved water sources brought long-term positive or negative changes in incidences of water-borne diseases in the target communities?*
- iv). To what extent has access to improved sanitation and hygiene products and services, brought long-term positive or negative changes (if any) in incidences of water-borne diseases in the target communities?*

The aim of questions 'iii' and 'iv' being to find out whether during the period of iWASH interventions: a) access to improved water supply has brought any shielding to the beneficiaries against diarrhoeal diseases' germs at the individual, household, and community levels; and b) adoption of sanitation and hygiene products and services is accompanied by reduction in diarrhoeal diseases.

## 2.0 METHODOLOGY

### 2.1 Study approaches

A participatory evaluation and theory-based evaluation was applied, by gathering qualitative information through semi-structured and conversational interviews, focus group discussion and workshop with beneficiaries.

### 2.2 Sampling procedures

#### 2.2.1 Selection of study villages

Two divergent villages were selected from a set of 8 first batch program villages to ensure coverage of recipient village variations in:

- access to market (using road condition and availability of public transport as a proxy); and,
- type of water supply promoted (comparing rope pumps using shallow wells and tap water system either using gravity or piped borehole schemes).

Access to market was set to be the major village selection criteria: if a village selected to represent piped water system came from area of poor market access then its counterpart village to represent rope pump system must come from good market access area and vice versa. **Table 1** shows the characteristics of the 8 first batch villages based on the above two stratification criteria.

**Table 1:**Characterization of the iWASH first batch villages based on water supply type and access to market

| District | Village name | Population           |                  | Water supply type      | Number of water points/distribution points | Access to market | Stratum code |
|----------|--------------|----------------------|------------------|------------------------|--|------------------|--------------|
|          |              | Number of households | Number of people |                        |  |                  |              |
| Mvomero  | Pemba        | 1,025                | 8,879            | Piped water system     | 22   | Poor             | A            |
|          | Kanga        | 654                  | 3,196            | Rope pump shallow      | 17   | Good             | B            |
|          | Makuyu       | 946                  | 8,768            | Rope pump shallow well | 36   | Good             |              |
|          | Bwage        | 304                  | 1,799            | Rope pump shallow      | 7  | Good             |              |
|          | Dihinda      | 1,430                | 7,569            | Rope pump shallow      | 10   | Good             |              |
|          | Mziha        | 1,56                 | 10,938           | Rope pump shallow      | 6  | Poor             | C            |
| Kilosa   | Mvumi        | 1,903                | 7,492            | Piped water system     | 35   | Good             | D            |

The two villages were selected using a multistage sampling process:

- i). Villages were stratified in four strata (A, B, C and D) based on water supply type and access to market;
- ii). Mvomero district was purposively selected because it contains the majority of the first batch program villages;
- iii). Pemba village was selected purposively to represent piped water system in poor market access area<sup>1</sup>; and
- iv). Kanga village was randomly selected from four villages having rope pump wells and with good market access.

### 2.2.2 Selection of interviewees

A stratified sampling strategy for interviewees was used based on wealth categories as stratification criteria. Therefore participatory wealth ranking was conducted in each sample village prior to selection of interviewees.

#### 2.2.2.1 Participatory wealth ranking

A one-day community meeting was held in each of the two study villages, attended by the village leaders and representatives from all sub-villages, and at least two individuals representing pastoralists. Brainstorming techniques and common participatory rural appraisal (PRA) tools were used to facilitate the discussion.

Participants were asked to divide into smaller groups of 6 - 10 people regardless of their gender and age. These different groups were asked the same two questions<sup>2</sup>:

- 1) *What is a 'better life' in their context, and*
- 2) *What were their perceived characteristics of an individual or household with a better life?*

The groups brainstormed and discussed the questions. With the help of a secretary, each group captured their views onto a flip chart and reported on their discussions during a plenary session to explain their group's responses to the questions asked. This was followed by a plenary session in which each breakout group presented a summary of their discussion and the participants as a whole agreed on a collective set of responses. The agreed responses to the two questions gave the list of indicators for households with "better life". Final agreement of the indicators was arrived at through pair-wise ranking (**Plate 1**).

Thereafter, participants were facilitated to:

- assign the minimum criteria for each wealth indicator that would define individuals or households with better life, which constituted the non-poor wealth group;

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<sup>1</sup>Based on the guiding village selection criteria the village to represent rope pump system had to come from area with good market access.

<sup>2</sup>These questions were asked to enlist the local indicators for wealth, which were used as the bases for ranking of households into different wealth categories.

- use the same indicators to provide criteria that define each of the other lower wealth categories i.e. less-poor, poor and poorest.



Figure 1: Snapshots showing wealth ranking exercises in Kanga and Pemba village

- To sort out the cards listed with all head of households into their respective wealth categories (For each household, wealth categories were determined for the current situation in the year 2013 and retrospectively for the year 2008)<sup>3</sup>.

The consequential list of households grouped by wealth categories provided the sampling frame for a stratified random sampling of interviewees discussed below.

### 2.2.2.2 Stratified random sampling of interviewees

Once the Wealth Rankings were agreed, interviewees were selected using stratified random sampling based on proportions of households in each wealth category. A total of 68 households were selected from both sample villages (**Table 2**).

**Table 2:** Population figures and sampling intensities for study villages used in iWASH impact assessment case study

| Village      | Number of households |             |           |           |           |           | Sampling intensity (%) | Population    |
|--------------|----------------------|-------------|-----------|-----------|-----------|-----------|------------------------|---------------|
|              | Total                | Interviewed |           |           |           |           |                        |               |
|              |                      | Non-poor    | Less poor | Poor      | Poorest   | Total     |                        |               |
| Kanga        | 654                  | 4           | 4         | 19        | 6         | 33        | 5.0                    | 3,196         |
| Pemba        | 1,025                | 4           | 8         | 18        | 5         | 35        | 3.4                    | 7,492         |
| <b>TOTAL</b> | <b>1,679</b>         | <b>8</b>    | <b>12</b> | <b>37</b> | <b>11</b> | <b>68</b> | <b>4.1</b>             | <b>10,688</b> |

The overall sampling intensity was 4.1%; it ranged from 3.4% in Pemba village to 5.0% in Kanga village. In addition, 13 school children interviewees were randomly selected from each of class six and seven at Kanga and Pemba primary schools in order to understand outcomes as perceived by school children.

## 2.3 Data collection

### 2.3.1 Semi structured interviews

Semi structured interviews were conducted using open ended questions (**Appendix 1**) to capture outcomes beyond those described by an array of indicators specified in the program monitoring and evaluation matrix<sup>4</sup>. The interviews were conducted with the selected 68 adult interviewees i.e. one adult from each selected household and 13 (7 girls and 6 boys) school children [noted in future we should interview the head of household and someone of the opposite gender].

<sup>3</sup>The year 2008 was taken a base year just before implementation of iWASH interventions

<sup>4</sup>Davies, R. and Dart, J. (2005). The "Most Significant Change" (MSC) Technique: A guide to its use. CARE International, United Kingdom.

### **2.3.2 Stakeholders workshop to undertake theory-based evaluation and lessons learnt**

A two-day stakeholders' workshop was held at Honolulu Hotel in Turiani town to engage beneficiaries in theory-based evaluation, and together reflect on any further information on the lessons learned.

The participants were representatives from a broad range of iWASH program beneficiaries from the two sample villages. They represented VSL, VSL Apex organization based in Turiani [Jumuiaya Vikundi vya Hisa Mvomero and Turiani (JUVIHIMTU)], school committee and teachers and water user groups/COWSOs and general community. In addition, leaders of the Mkindo Water User Association participated in the workshop.

The workshop began with an introductory talk in which two facilitators used brainstorming techniques to guide participants to construct the theory of change for iWASH program with respect to health (**Appendix 4**) and economic (**Appendix 5**) impacts. Thereafter participants were split into four breakout groups of six to seven people defined by distinct categories of beneficiaries.

These groups were asked to discuss and record health and economic challenges they faced before the iWASH program and outline possible strategies that would help to solve the challenges, and identify any possible negative side effect that could be associated with each proposed strategy. Also, with reference to the constructed iWASH theory of change, the groups were asked to respond to two basic questions:

- 1. What else could have been done in order to enhance significant health impacts?*
- 2. What else could have been done in order to enhance significant economic impacts?*

The group exercises were followed by plenary session in which each group presented and defended its responses. During plenary sessions participants were asked and guided to avoid defensive reaction but encourage evidence-based argumentation. Facilitators summarized the points of consensus for each discussion topic, which were compiled to form the overall response for each topic

Group work and plenary sessions were reconvened to discuss what each group perceived as being successes or failures of the iWASH program and the reasons behind this. Consensus and divergent points were summarized again and compiled as the overall the overall lessons learnt.

### **2.3.2 Focus group discussion with VSL representatives**

Twelve individual representatives from three VSL groups (Umoja-Sechambo, Kiumaka and Amani VSL groups) from Kanga village were engaged in a discussion to define the successful VSL members and groups; and provide respective indicators and criteria based on their own perspective. The participants were divided into three groups each with 4 members. Each group was asked to respond to the two questions:

1. *What a successful VSL group is in their context<sup>5</sup>?; and*
2. *What a successful VSL member is in their context?*

This was followed by a plenary session in which each group presented a summary of their discussion and all participants discussed and agreed on a collective set of responses. The discussions gave rise to two set of indicators and criteria:

1. *Indicators and minimum criteria for a success individual VSL group member, and*
2. *Indicators and minimum criteria for a success individual VSL group member*

Final agreement on the two sets of responses was arrived at through pair-wise ranking exercises, and resulted in indicators and criteria for better performing VSL members and groups.

Subsequently, participants were facilitated to:

- define lower performance categories for both VSL members and groups i.e. good and poor performer;
- use the already identified indicators to provide criteria that define each of the lower VSL groups and members performance categories i.e. good performer and poor performer;
- sort out the list of their fellow VSL members into their respective performance categories

## **2.4 Data processing and analysis**

Data from semi-structured interviews were summarized into individual Most Significant Change (MSC) stories, which were examined and text coded to highlight emerging themes, issues, concepts and recommendations. The coded texts were entered in SPSS computer software and analysed to generate descriptive statistics such as frequencies and percentages; and inferential statistics notably chi-square test for association.

Data from stakeholders' workshop and focus group discussion with VSL representatives were summarized thematically to highlight commonalities and extremes. In addition, the dataset for the ranked VSL members were linked to wealth ranked data for the respective village to ascertain the wealth categories of the individual VSL members; and quantitatively analysed to determine two parameters:

- 1) *Association between VSL membership and their prior wealth category, and*
- 2) *Association between prior wealth ranks and performance; and*

Furthermore, association between gender and performance of VSL members was determined for all members.

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<sup>5</sup>These questions were asked to enlist the key indicators and criteria for successful individual VSL member and groups. The indicators and criteria were used as the bases for ranking of VSL members and groups in different performance categories

### 3.0 ANALYSIS AND RESULTS

Summaries of the MSC stories collected from interviewees are included in **Appendix 3**. Each story is assigned with an identification number used to reference these stories using square brackets throughout this report. Following the qualitative and quantitative analyses, and review of individual stories key themes were identified and their results summarized in the subheadings below.

#### 3.1 Results of Community Defined Wealth Indicators

The wealth indicators identified in Kanga and Pemba during the Community Meetings are set out in **Table 3**. These reflect similar findings in other poverty studies (Elis and Mdoe, 2003; Vyamana, 2009).

**Table 3:** Wealth indicators (individuals or households) considered to have better life in Kanga and Pemba villages

| Indicators for good life                                 | Criteria   |  |
|--|--|--|
|  | Kanga village  | Pemba village                                    |
| <b>Number of meals a day</b>                             | Not applicable   | Three meals a day and can choose what to eat     |
| <b>Housing condition</b>                                 | Iron roofs, cement floor and burnt bricks walls                                  | Iron roofs, cement floor and burnt bricks walls  |
| <b>Business (income generating activities)</b>           | Engaged in milling machine, shop and transport service operation such as minibus | Engaged in milling machine and shop <sup>6</sup> |
| <b>Size of land owned</b>                                | At least 5 acres   | At least 10 acres                                |
| <b>Livestock</b>   |  |  |
| Cattle (farmers)   | At least 1   | At least 10                                      |
| Cattle (pastoralists)                                    | At least 50  | At least 50                                      |
| Sheep/goats (farmers)                                    | At least 5   | At least 5                                       |
| Sheep/goats (pastoralists)                               | At least 50  | At least 50                                      |
| Pigs (farmers)   | Not applicable   | At least 10                                      |
| Pigs (pastoralists)                                      |  | Not applicable                                   |
| Chicken for both (farmers and pastoralists) <sup>7</sup> | At least 10  | At least 10                                      |
| <b>Ownership of means of transport</b>                   |  |  |
| Vehicle  | At least 1   | Not applicable                                   |
| Tricycle (Bajaj)   | At least 1   | Not applicable                                   |
| Motorcycle   | At least 1   | At least 2                                       |
| Bicycle  | At least 1   | At least 2                                       |

<sup>6</sup>Transport service operation business is not found in Pemba village due to poor roads

<sup>7</sup>For the non-poor, chickens are less important as they are kept for leisure rather than an indication of wealth parse

|   |   |                       |
|---|---|-----------------------|
| Ability to access clean and safe water <sup>8</sup> | No longer applicable following improved access to safe and clean water as a result of iWASH interventions                     | Not applicable        |
| Education   | Can afford to take children to private secondary school <sup>9</sup>  | Not applicable        |
| Health  | Can afford health services from private hospitals such as Bwagara without having to ask for support from friends or relatives | Not applicable        |
| Ownership of improved latrine                       | Have improved latrine   | Have improved latrine |

The prioritized list of wealth indicators identified in Kanga and Pemba together with the respective ranks scored during pair-wise ranking are set out in **Table 4**

**Table 4:** Prioritized list of wealth indicators in Kanga and Pemba villages

| Indicator  | Kanga village            |                     | Pemba village*           |                     |
|--|--------------------------|---------------------|--------------------------|---------------------|
|  | Pair-wise ranking scores | Order of importance | Pair-wise ranking scores | Order of importance |
| Number of meals a day  | 0                        | 7                   | 4                        | 4                   |
| Housing condition  | 10                       | 1                   | 8                        | 1                   |
| Participation in business (an income generating activity)      | 8                        | 2                   | 5                        | 3                   |
| Size of land owned   | 6                        | 3                   | 4                        | 4                   |
| Type and number of livestock                                   | 6                        | 3                   | 5                        | 3                   |
| Ownership of means of transport (vehicles, motorbike, bicycle) | 8                        | 2                   | 2                        | 5                   |
| Ownership of an improved latrine                               | 4                        | 4                   | 7                        | 2                   |
| Ability to access clean and safe water                         | 3                        | 5                   | N/A                      | N/A                 |
| Ability to afford education expenses                           | 2                        | 6                   | N/A                      | N/A                 |
| Ability to afford education expenses                           | 6                        | 3                   | N/A                      | N/A                 |
| Type and quality of clothing                                   | Not applicable           | Not applicable      | 1                        | 6                   |

\*NA stands for "not applicable"

Based on the prioritized indicators, criteria for the remaining wealth categories, i.e. less, poor and poorest, are presented in **Appendix 2**.

<sup>8</sup>In Kanga village, participants noted that although they had listed access to clean and safe water as indicator for better life its importance was no longer valid as a result of iWASH interventions. They noted that before iWASH only those with better or good life would access clean and safe water as opposed to the current situation where everybody in the village has access to clean and safe water. Each household needs to pay a fee of one thousand per month to the respective water user group, which most community members can afford. For a few who are too poor to afford 1000 they are allowed to get water for free from their respective water user groups.

<sup>9</sup>In these communities, the type of school in which children attain primary school does not matter but secondary schools; all children go to the primary school within their village

### 3.1.1 Pastoralist and Farmer differences

The occurrence of distinct groups of farmers and pastoralists is apparent in the studied villages. Although commonalities were easily identified, farmer-pastoralist differences and tensions on contested indicators were also evident. Similar to the findings by Ellis and Mdoe (2003), it was revealed that for pastoralists the most important indicators of better life were livestock i.e. cattle and goats/sheep, which they own in large numbers. On the other hand, all farmers identified housing condition and land for farming as the most important indicators.

In terms of identifying property, there needs to be some caution in data collection as it was noted that in some pastoralist communities poorer households may work as casual labourers keeping large herds of cattle in their homestead (*boma* in Massai vernacular) for their wealthier neighbours which may be wrongly identified as their property. It is recommended that where possible observations and interviews be combined when assessing ownership of livestock in the pastoral communities.

### 3.2 Perceived Livelihood Challenges and Opportunities

#### 3.2.1 Perceived Livelihood Challenges

Quantitative analysis of the struggle and challenges faced in the studied villages over the last five years are shown in **Table 5**.

**Table 5:** Percentage interviewees specifying their life struggles and challenges in Kanga and Pemba villages

| Struggles and challenges                                 | Current wealth category |                    |               |                  |                  | Linear-by-Linear Association test statistics |
|--|-------------------------|--------------------|---------------|------------------|------------------|--|
|  | Non poor (n = 8)        | Less poor (n = 12) | Poor (n = 37) | Poorest (n = 11) | Overall (n = 68) |  |
| Inadequate health services                               | 12.5                    | 8.3                | 18.9          | 0.0              | 13.2             | $\chi^2 = 0.095$ ; df = 1; p = 0.758         |
| Inadequate water supply                                  | 25.0                    | 25.0               | 45.9          | 18.2             | 35.9             | $\chi^2 = 0.085$ ; df = 1; p = 0.771         |
| Inadequate education services (teachers, buildings etc.) | 12.5                    | 25.0               | 13.5          | 18.2             | 16.2             | $\chi^2 = 0.009$ ; df = 1; p = 0.925         |
| Outbreak of crop vermin                                  | 12.5                    | 0.0                | 8.1           | 9.1              | 7.4              | $\chi^2 = 0.018$ ; df = 1; p = 0.894         |
| Diarrhoea diseases                                       | 25.0                    | 25.0               | 16.2          | 27.3             | 20.6             | $\chi^2 = 0.03$ ; df = 1; p = 0.863          |
| Diseases other than diarrhoea                            | 12.5                    | 8.3                | 21.6          | 18.2             | 17.6             | $\chi^2 = 0.524$ ; df = 1; p = 0.465         |
| Drought  | 62.5                    | 66.7               | 73.0          | 63.6             | 69.1             | $\chi^2 = 0.051$ ; df = 1; p = 0.821         |
| Decline in crop yields                                   | 62.5                    | 66.7               | 56.8          | 63.6             | 60.3             | $\chi^2 = 0.046$ ; df = 1; p = 0.831         |
| Food shortage or hunger                                  | 12.5                    | 25.0               | 51.4          | 54.5             | 42.6             | $\chi^2 = 5.402$ ; df = 1; p = 0.02          |

As shown in **Table 5**, interviewees in both villages told stories of their experiences with prolonged drought and water scarcity over the last five years regardless of wealth ranking. **All**

**the wealth ranks narrated how drought culminated in drying of water sources, increasing water scarcity and later leading to crop failures and food shortage or hunger for some households; and as the major cause of their poverty and lack of development [e.g. Stories 7, 40 and 45].** They told their stories about water scarcity as if they were talking of one of their most feared events.

Jacob Magonda from poor wealth category in Pemba village reported [Story 7]:

“...Drought has increased over the last decade, and so harvests and incomes are continuously dwindling. Hunger has knocked at the door of my family and many other families; sometimes I have no food to feed my children...”

Hassan Mohamed Mayoga from poorest wealth category in Kanga village reported [Story 40]:

“...drought has become frequent and more severe; our harvests are decreasing year after year..... I can see the future being miserable, something needs to be done to our farming practices to make it withstand the recurrent drought.”

Behengani Kadeko, a pastoralist from non-poor wealth category in Pemba village narrated [Story 45]:

“...As drought continued, grazing lands deteriorated and many rivers dried; farmers got less and less harvests and food prices rose. We could no longer afford food to sustain our lives from livestock sales. The overall local production and economy systems were virtually destabilized, it nearly became a tragedy!”

**Most interviewees indicated a clear link between drought and water scarcity [Story 13]** and those who mentioned water scarcity indicated that it had been a challenge for all community members.

Water collection and queuing at the water sources can take several hours each day. Many found they had to put economic and / or educational activities aside in order to provide time and energy for water fetching. Within the African context, women and children are responsible for water collection. This can involve collecting water directly from a water source, or even paying someone else to collect water for them. Those from poorest families that cannot afford to purchase water from water vendors are frequently disproportionately affected as they are not at liberty to buy pre-collected water.

By spending time collecting water, women’s time for activities to support the household (such as farming for domestic food on their land) is reduced and can leave them with little or no opportunity for gainful employment elsewhere<sup>10</sup>. Where men are obliged to undertake water collection the same would apply for their time. Children can also be involved in water collection, often helping the sick and elderly in the community, leaving them with little or no time to attend school, limiting (or eradicating) their access to education and a potential way of lifting them out of poverty in the future.

For example, Mwajuma Ally Koloela from Pemba village reported [Story 63]:

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<sup>10</sup>State of the world’s children 2005: Millennium development goals needs assessments for Ghana, Tanzania, and Uganda. 2004. UNICEF

“...The ones coming from water fetching would be tired and so failed to do other important economic activities. Some pretended to postpone farming activities hoping to resume the next day but they always found themselves unable to do anything! I do not know how to explain, but it was really a terrible situation!”

Therefore, although all wealth categories are impacted by drought, the poor and poorest are significantly (Linear-by-Linear Association test statistics:  $\chi^2 = 5.402$ ;  $df = 1$ ;  $p = 0.020$ ) as they are more likely to experience food shortage or hunger than the non-poor and the less-poor. This finding is in line with other vulnerability studies, as the poor and poorest are dependent on precarious resources to cope with the struggle and challenges (Sen,1981) and have fewer means to cope without damaging loss (Chambers, 1997). The implication is that the poor and poorest should receive special attention in design and implementation of development projects.

As listed in **Table 5**, other challenges in order of their importance were:

- **inadequate water supply;**
- **diarrhoeal diseases, and other diseases including malaria;**
- **inadequate education services;**
- **inadequate health services; and**
- **outbreaks of crop vermin especially monkeys.**

For instance, water was described not only as scarce but also dirty. Anastazia Stephano from Kanga village explained the repercussions from drinking dirty water [**Story 33**]:

“...We had to walk long distances to fetch water, which was dirty and so ruined our health; we suffered from diarrhoea and all sorts of stomach problems...”

This accords with the usual impacts of water-borne diseases, and can mean sick members of families are not able to work. This reduces household labour forces and income, or requires working members of the family to stay with them to provide care, diverting remaining income to support them and fund what can be expensive medical treatment<sup>11</sup>

### **3.2.2 Perceived Livelihood Coping Strategies**

Quantitative analysis of the narrated coping strategies is presented in **Table 6**. **There were multiple responses on the coping strategies, with a single household employing more than one strategy at a time. Coping strategies showed statistical significant differences between wealth categories with respect to dependence on casual labour and trading in agricultural produce to cope with shortage of food or hunger, and decreased incomes:**

- the poor and poorest were significantly (Linear-by-Linear Association test statistics:  $\chi^2 = 5.024$ ;  $df = 1$ ;  $p = 0.025$ ) more likely to rely on casual labour to cope with food shortage or hunger and decreased incomes than the non-poor and less-poor;

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<sup>11</sup> Water and Sanitation Program. 2008. World Bank

**Table 6:** Percentage interviewees from both villages citing strategies to cope with the food shortage or hunger and decreased incomes

| Strategies                                       | Current wealth category |                    |               |                  |                  | Linear-by-Linear Association test statistics          |
|--|-------------------------|--------------------|---------------|------------------|------------------|---|
|  | Non poor (n = 8)        | Less poor (n = 12) | Poor (n = 37) | Poorest (n = 11) | Overall (n = 68) |   |
| Casual labour                                    | 0.0                     | 0.0                | 35.1          | 27.3             | <b>23.9</b>      | $\chi^2 = 5.024$ ; df = 1; p = 0.025                  |
| Remittances                                      | 0.0                     | 9.1                | 13.5          | 0.0              | <b>9.0</b>       | $\chi^2 = 0.045$ ; df = 1; p = 0.832                  |
| Trading in agricultural produce                  | 25.0                    | 9.1                | 5.4           | 0.0              | <b>7.5</b>       | $\chi^2 = 4.118$ ; df = 1; p = 0.042                  |
| Selling livestock                                | 25.0                    | 27.3               | 5.4           | 9.1              | <b>11.9</b>      | $\chi^2 = 3.123$ ; df = 1; p = 0.077                  |
| Vegetable gardening or tree nursery              | 0.0                     | 33.3               | 10.8          | 18.2             | <b>14.7</b>      | $\chi^2 = 0.039$ ; df = 1; p = 0.844                  |
| Vegetable trading                                | 0.0                     | 8.3                | 0.0           | 0.0              | <b>1.5</b>       | $\chi^2 = 0.754$ ; df = 1; p = 0.385                  |
| Local brew                                       | 0.0                     | 8.3                | 2.7           | 9.1              | <b>4.4</b>       | $\chi^2 = 0.259$ ; df = 1; p = 0.611                  |
| Restaurant or food vending                       | 12.5                    | 0.0                | 5.4           | 0.0              | <b>4.4</b>       | $\chi^2 = 0.719$ ; df = 1; p = 0.396                  |
| Brick making or masonry                          | 0.                      | 0.0                | 10.8          | 0.0              | <b>5.9</b>       | $\chi^2 = 0.351$ ; df = 1; p = 0.554                  |
| More water to keep more livestock                | 25.0                    | 8.3                | 8.1           | 0.0              | <b>8.8</b>       | $\chi^2 = 2.956$ ; df = 1; p = 0.086                  |
| <b>Engagement in any water linked activities</b> | <b>37.5</b>             | <b>50.0</b>        | <b>35.1</b>   | <b>27.3</b>      | <b>36.8</b>      | <b><math>\chi^2 = 0.632</math>; df = 1; p = 0.427</b> |
| <b>Use savings or loan from VSL</b>              | 12.5                    | 0.0                | 8.1           | 9.1              | <b>8.8</b>       | $\chi^2 = 0.543$ ; df = 1; p = 0.461                  |

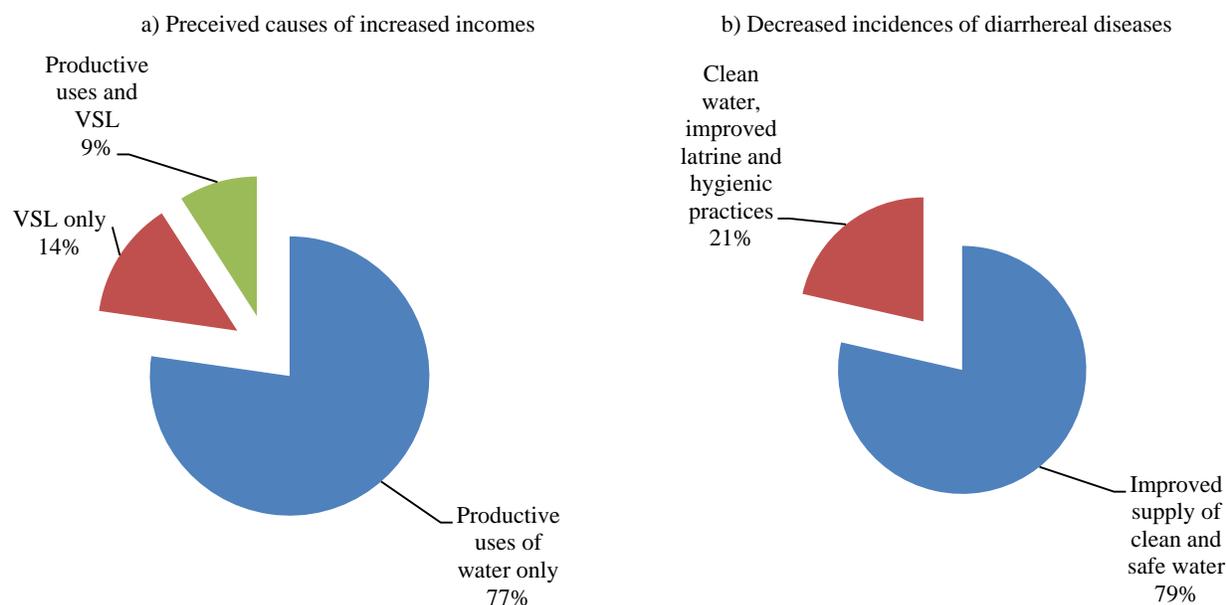
- the non-poor and less-poor were significantly (Linear-by-Linear Association test statistics:  $\chi^2 = 4.118$ ; df = 1; p = 0.042) more likely to rely on trading in agricultural produce. Though not statistically significant<sup>12</sup>, the tendency was more likelihood of the non-poor (25.0%) and the less-poor (27.3%) to sell livestock to cope with the challenges than the poor (5.4%) and the poorest (9.1%).

**The picture was less clear for use of the water-linked economic activities, where each wealth category tended to participate for varying degrees.** Almost counter intuitively, no significant correlation was found between poverty levels and engagement in water-linked economic activities. This means that neither the poorest households, nor the poor households were significantly more (or less) likely to engage in water-linked economic activities than are the more prosperous households who have more resources and the means to take up such activities. As shown in the next sub-section, these water-linked activities were the major connections through which iWASH impacted positively on the livelihoods of the beneficiaries. **The lack of significant difference between wealth categories with regard to their engagement in water-linked economic activities could be an indication of the equitable nature of the iWASH program interventions.**

### 3.2.3 Impact of iWASH Activities Livelihood Coping Strategies

Regardless of wealth category, most interviewees talked **about improved water supply and village savings and loan (VSL) scheme as the foundation of all sectors of their livelihoods** [e.g. **Stories 64 & 65**]. The perceived causes of their livelihood changes are shown in Figure 2.

<sup>12</sup>In fact, this is likely to be statistically significant if we take into account the relative values of the type and numbers of livestock kept by the non-poor and less-poor *vis-à-vis* the poor and poorest.



**Figure 2:** Perceived causes of the reported positive significant changes in Kanga and Pemba villages

Of the 22 interviewees who reported increased incomes over the last five years, the majority (77%) attributed it to improved water supply that enhanced their engagement in water linked productive activities notably gardening, brick making, local brew and food vending. The remaining 14% attributed their increased incomes to VSL only, and 9% to a combination of VSL and engagement in productive uses of water.

A similar pattern was observed for the perceived causes of reduced incidences of diarrhoeal diseases where the majority (79%) attributed it to improved clean and safe water supply whilst the remainder attributed it to use of improved latrines, and/or adoption of hygienic practices such as hand washing after latrine visit and before meals. The fact that the majority did not perceive any linkage of incidences of diarrhoea diseases to inadequate latrines but clean and safe water supply can have an important practical implication. One plausible implication of these results is that most of the beneficiaries may not be sufficiently motivated to construct improved latrines once they have access to safe and clean water supply.

A close look at the MSC stories collected (**Appendix 3**) suggests that the activities under the iWASH Program resulted in the perceived causes of change through health and economy (household production and income).

*Health impacts:* occurred through improved water supplies and adoption of improved sanitation facilities and practices as:

- Communities could either refrain from drinking unsafe water once clean and safe water is made available or adopt of improved sanitation and hygiene facilities and practices or both; and
- By generating a dependable water supply to dispensaries, and/or health centres.

*Economic impacts:* occurred through:

- increased production from labour that is saved from water fetching;
- engagement in water-based economic activities such as gardening, restaurants, food-vending and brick making; and
- access to investment capital through Village Savings and Loan Schemes (VSL).

**Table 7:** Percentage of interviewees experiencing increased income and decrease in diarrhoeal diseases over the last five years in Kanga and Pemba villages

| Wealth category before the project           | Category of change                  |  |
|--|-------------------------------------|--|
|  | Increased income (%)                | Decrease incidences of diarrhoeal diseases (%) |
| Non poor (n = 8)                             | 37.5                                | 12.5   |
| Less poor (n = 7)                            | 0.0                                 | 14.3   |
| Poor (n = 39)                                | 41.0                                | 20.5   |
| Poorest (n = 14)                             | 21.4                                | 28.6   |
| <b>Overall (n = 68)</b>                      | <b>32.4</b>                         | <b>20.6</b>                                    |
| Linear-by-Linear Association test statistics | $\chi^2 = 0.001$ ;df = 1; p = 0.979 | $\chi^2 = 0.947$ ;df = 1; p = 0.331            |

Overall, 32.4% (22 out of 68 interviewees) experienced an increase in income, whilst 20.6% (14 out of 68 interviewees) experienced reduced incidences of diarrhoeal diseases. **The 32.4% benefiting from water-linked activities of represents spontaneous engagement in multiple use of water (MUS), which is likely to increase following recent stimulation through MUS interventions.** This claim is justified by the several cases where interviewees reported to have failed to take advantage of increased water supply due to inadequate technical support. MUS activities are designed to provide technical support on water-linked economic activities including gardening and improved livestock keeping. **There was not any significant correlation between wealth categories and the MSC.** This suggests that all wealth categories had the same likelihood to experience the positive changes reported.

### 3.3 Impact of iWASH Water Supply Activities

**With exception of two out of 68 adult interviewees (2.9%) [Stories 2 & 30] and one out of 13 school children (7.7%) [Story 81], all of those interviewed testified that iWASH had helped them to solve the water scarcity and diarrhoea diseases challenges.** Improved water supply, apart from bringing joy to people across social groups in the studied villages, was seen as the major 'hub' through which MSC in the lives of the community members happened. The

majority of adults and schoolchildren of both genders were very grateful to the iWASH program for solving their water and diarrhoeal diseases problems [e.g. **Stories 74, 30, 41 & 72**].

For example, with respect to water scarcity, Loveness Timoth, a school child from Kanga primary school reported [**Story 74**]:

“...We have been provided with rope pump wells all over the village; I do not have to toil again to fetch water, I get it close to our home. I have enough water to wash my clothes; I am now a very smart girl...”

Similarly, Francis John King’ondo from Pemba village reported [**Story 30**]:

“...iWASH supported us to construct a tap water system from the source in the mountains. We are very thankful to iWASH. There are many villages around us who do not have clean and safe water. iWASH has been like an angel to us...”

Equivalent recounts were given for the observed reduction in diarrhoeal diseases. Magreth Jonja Buma from Kanga village reported [**Story 41**]:

“...,iWASH supported us with modern rope pump wells you see in many parts of our village. We are now getting abundant clean water from the rope pump wells, life has become better...Life is now enjoyable; my grand children suffer from diarrhoea no more...”

John Paul, a school child from Kanga primary school further reported [**Story 72**]:

“...Despite of that challenge, I will never forget iWASH. We used to have worse toilets that did not have water. We used grasses or papers to clean ourselves after visiting toilets; this made me and my friends get dysentery several times. iWASH has brought us nicest toilet, and clean and plenty of tap water; we no longer suffer from any stomach disease...”

**To many, the improved water supply was seen as liberation from the hard work of fetching water from distant sources to dedicate more time (and use the water) to support their livelihoods, generating direct economic benefit.** A comment from Yusuph Mbega of Pemba village reinforces the theory of change that guides iWASH water supply component [**Story 64**]:

“...It is this abundant water that is helping us to start and strengthen other sectors of our local economy: gardening, brick making and food vending all need water! Also we now have more time to engage in other economic activities because there is no wastage of time in searching for water anymore...”

Ramadhani Dunga from the same village made a similar recount [**Story 65**]:

“...nowadays, water taps are everywhere; water is plenty. People are using water to make bricks; as a mason I get more house building tenders than before, and my income has become stable...”

Sophia Mathias from Pemba village made this comment [**Story 13**]:

“... I have revived my local brew business after getting tap water from iWASH; I had stopped brewing when water became scarce. Income from my local brew business helps me to buy food for the family and meet other family obligations. Now that we have plenty water, I plan to start a restaurant business because this place where I live is a good site for a restaurant business; I believe my income will increase...”

Thomas Paul Goko from Pemba village [**Story 66**]:

“...I really thank iWASH for the tap water which is now found very close to my home. My wife has now settled, she helps me with farming because she is not spending much time in the search for water. We are cultivating larger farms than before. Although rains are not good as before at least we can produce enough to feed the family and sell some surplus...”

**There was also evidence of indirect livelihood benefits even for those who were constrained from direct use of improved water supply for improving their livelihoods:** For example, those who could not directly engage in gardening as the water points were not directly located in their farmland, still used the opportunity to start a vegetable trading; they bought vegetables from producers and transported them to sell in Turiani town. The narration from Rashid Hussein of Kanga village demonstrates this [Story 53]:

“...iWASH brought us rope pump wells after we had suffered water scarcity for several years. Since then water is plenty; those who live close to the wells started vegetable gardening. Though I do not do gardening I make life out of the gardens of my fellows. I started with the vegetable trade last year; I buy vegetables from the local gardeners and transport them to Madizini town where I sell at lucrative prices...”

**Nevertheless, even with the improved access to water the villagers were still concerned about the impact of drought on their livelihoods and on the decline of the crop yields.**

Simon Stephano, from Pemba village commented [Story 50]:

“...we are grateful to iWASH, it supported us to get water from the taps; something I never expected in a remote village like Pemba! Now, my wife helps me with farming activities; farm size has increased slightly but the weather is just too bad to realize an increase in harvest...”

Bakari Hussein of Kanga village reported [Story 55]:

“...I thank iWASH who brought rope pump wells in our village; the tap is in front of my house. We do not have to waste our time searching for water. We use much of our time for farming; drought is jeopardizing our energy; we do not harvest so we continue to starve even though we have increased labour input in farming...”

The majority insisted that their current farming systems could not withstand drought and blamed the District Council that had not allocated any agricultural extension worker in these villages since independence. Inadequate agricultural extension services was also seen as a stumbling block for them to take an opportunity of improved water supply for gardening [e.g. Stories 43 & 50].

Paul Mgoya of Pemba village reported [Story 43]:

“... I thank iWASH... water is plenty in the taps you see all over the village. We now have more time to work in our farms, my family has increased the size of the farm from three to five acres but the crops are not growing well because our traditional farming methods are no longer working, our energy and seeds are wasted! It is unfortunate that we do not have an agricultural extension worker in our village, so we are ignorant about modern farming methods. I believe, with the plenty water we have now, if we could get support on modern farming methods and acquire crop varieties that withstand drought our life would be improved even more...”

Simon Stephano from Pemba [Story 50] complained:

“...some few people have made use of the abundant water from the taps to cultivate vegetables in irrigated gardens, this seems to be our saviour; but I and my family have not yet benefited. There is no any agriculture extension worker to help us with the needed technology to make use of the abundant water...”

**Improved water supply can therefore increase engagement in water-linked productive activities but it is limited by the level of support in other sectors of their livelihoods particularly farming. These findings support the iWASH concept of multiple use systems**

**(MUS) that some productive activities occur naturally but others have to be supported and stimulated to maximize outreach.** These activities to simulate MUS had only started at the time when this research was conducted.

**A few also reported persistence of water scarcity problem** and appealed to iWASH for help. Malkus Mgaya from Lukindu sub-village in Kanga village reported [**Story 2**]:

“...Drinking water is still scarce too in our area. iWASH brought modern rope pump wells in our village but we could not raise the cash contribution; so we missed that opportunity. We are still drinking water from our traditional wells that is dirty and unsafe. On behalf of residents of this area, I would like to request iWASH to help us...”

Similarly, Francis John King’ondo from Pemba village, reported [**Story 30**]:

“...I would like to request iWASH to help our fellows in Embula to get water like us because they contributed their energy and money for construction of the gravity water system in our village but till now they don’t have any water tap in their area. We are ready to contribute labour and money if we get a little technical support from iWASH...”

Unlike at the Pemba primary school, pupils at Kanga primary school reported that they had no functional water point at the school even though they were grateful to iWASH for the improved water supply in the general village. These were the words of Rehema Ally, a girl from Kanga primary school [**Story 81**]:

“...life at school is still challenging; the rope pump well that was drilled at our school never produced any water. We still suffer from water shortage while at school...”

The villages still reported inadequate health services, education services and that they suffered from outbreaks of crop vermin, issues not tackled under the iWASH program.

### **3.4 Impact of iWASH Village Savings and Loans (VSL) Schemes**

VSL was reported as improving livelihoods for certain people, particularly as an assurance for capital accumulation and security of assets, as shown by the following extracts:

Anna Rashid Chazua, a widow from Kanga village reported [**Story 26**]:

“... I do grocery and restaurant businesses... I do not find any problem to run my family even though I do not have a husband. I have seen improvement in my business and life in general over the last five years. I got entrepreneurship trainings from village savings and loan scheme promoted by PEMA and CARE; I can plan and manage my business better than before. In the past, it was difficult to get business capital; people had to sell their land to get business capital. This changed after introduction of village savings and loan (VSL) scheme; I got my business capital from VSL...”

Yusuph Mbega who runs a business in Pemba testified that his prosperity came through VSL. He reported [**Story 64**]:

“...my shop is the biggest in the village... I do farming but use casual labourers...In 2010, CARE introduced village savings and loan (VSL) scheme in our village through trainings and awareness creation meetings...I joined the first VSL group...I got a loan that I invested in the shop business you see flourishing today. Since then many VSL groups have been formed, there are about 14 VSL groups in our village. VSL has improved our lives, many VSL members have managed to start various enterprises: shops, poultry, food vending, brick making and local brewing. ...some bought motorcycles, which generate their incomes and serve as the

only means of transport for people and crops to the roadside and up to Turiani town. With the motorbikes, most farmers are getting more profit as they are able to transport their crops to sell in better markets...”

Some interviewees still registered their concerns about the VSL. For example, Omary Said from Kanga village reported [Story 52]:

“...I hear that there is an opportunity to take loans from village and savings scheme, but my family is not happy with me taking a loan. They are afraid that if I fail to repay the loan, it would be an issue for the whole family; our nice house could be seized...”

Representatives from VSL groups defined a successful VSL member as the one who:

- is economically independent;
- with adequate savings; and
- repay the loan in time.

Based on these indicators and criteria for successful individual VSL members and groups were identified around three domains: economic sufficiency; amount of land added from VSL; ability to deposit regular savings and loan repayments within the last three consecutive loan occasions as summarized in **Table 8** and **Table 9**, respectively.

**Table 8:** Indicators and criteria for gauging success of individual VSL members in Kanga village

| Indicators  | Criteria for success categories of VSL members        |   |  |
|---|---|---|--|
|   | Better  | Good  | Poor   |
| Economic dependence                                     | Can meet at least 95% of his/her economic needs       | Can meet 80% to 95% of economic needs             | Can meet less than 80% of economic needs   |
| Size of land added from VSL                             | 1 – 2 acres   | 0.5 to 1 acres                                    | 0 – 0.25 acres   |
| Regular savings deposits                                | Deposits savings in more than 90% of savings meetings | Deposits savings in 70% - 80% of savings meetings | Deposits savings in less than 70% of savings meetings  |
| Timely loan repayment for the last three loan occasions | Timely repayment of 3 out of 3 loans                  | Timely repayment of 2 out of 3 loans              | Timely repayment of 1 out of 3 loans; and sometimes hard to repay and properties might be seized |

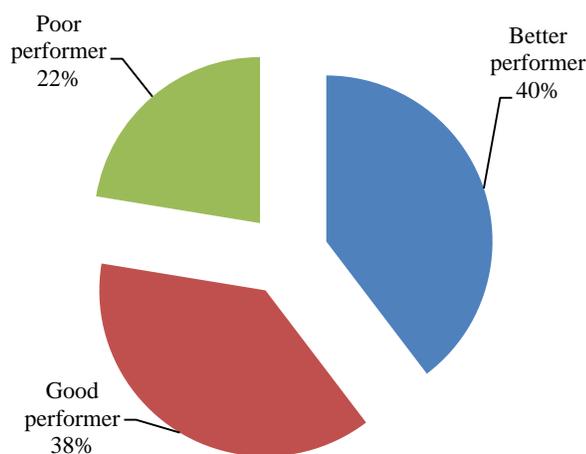
As shown in **Tables 8 and 9**, there is a strong similarity between factors determining success of VSL members and their respective groups. For example, while the individual members are assessed based on their ability to meet their economic obligations, the groups are assessed on their ability to create economic investment opportunities to the members. Economic opportunities correlate with asset accumulation such as land.

**Table 9:** Indicators and criteria for gauging success of VSL groups in Kanga village

| Indicators  | Criteria for success categories of VSL groups   |                         |                      |
|---|---|-------------------------|----------------------|
|   | Better  | Good                    | Poor                 |
| Type of income generating projects provided with capital from VSL | <ul style="list-style-type: none"> <li>• Street vending business, shops or kiosk</li> <li>• Livestock keeping</li> <li>• Agriculture</li> </ul> | Street vending business | No any business      |
| Persistence of the members  | >70%  | 50% - 70%               | <50%                 |
| Trends in loan repayment  | >90%  | 80% - 90%               | <80%                 |
| Capacity to resolve disputes among members <sup>13</sup>          | High or very high ability   | Average ability         | Little or no ability |

Members’ characteristics such as trends in saving deposits and loan repayments correlate with features of the groups that determine loan repayment and persistence of the group. However, a unique feature of the success of VSL groups is the capacity to resolve disputes among members, which is related to the group governance quality.

Performance of the individual VSL members from the three groups assessed is shown in **Figure 3**.



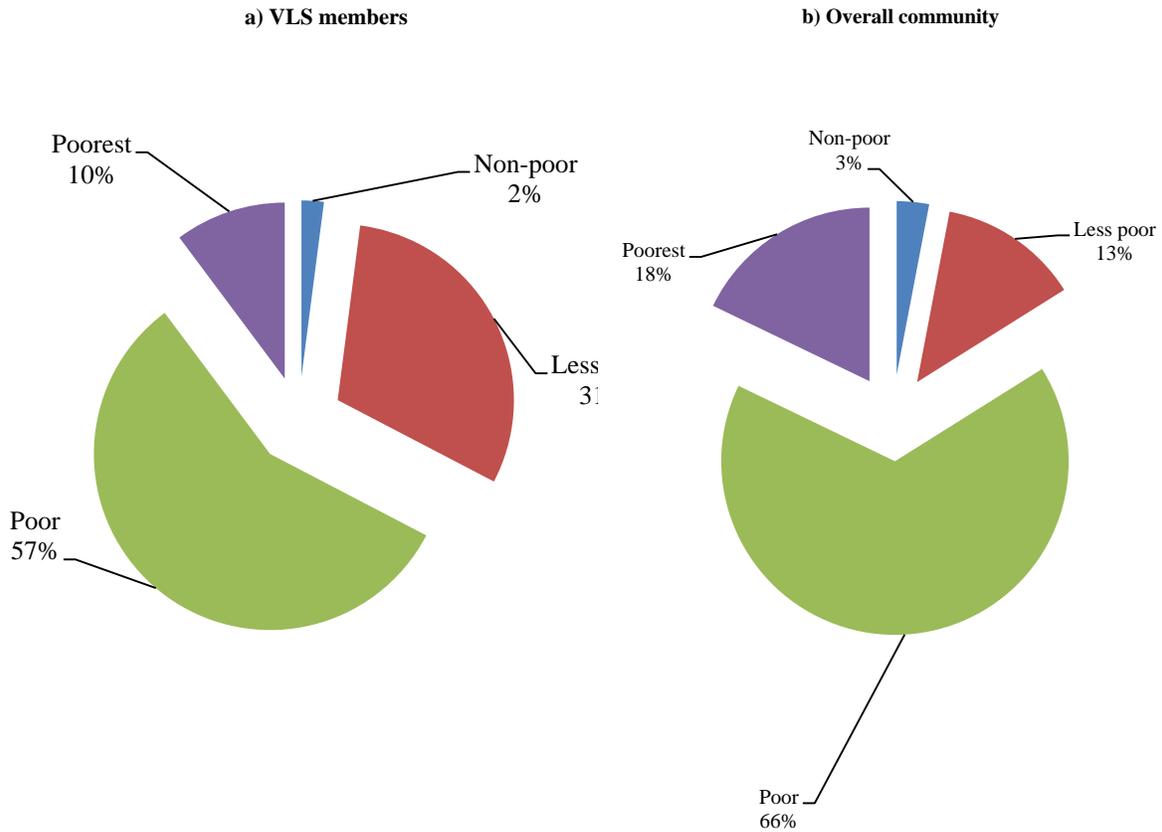
**Figure 3:** Distribution of selected individual VSL members by their performance

The performance of individual members from the assessed VSL groups was generally fair as 78% of the members performed good or better.

There was no significant association between wealth category and VSL membership. However, the proportions of the non-poor and less poor in VSL membership were slightly higher compared to their proportion in the community. The poor and poorest tended to be less

<sup>13</sup>Groups with high or very high ability resolve disputes instantly and accomplish everything within the group; those with average ability resolve most of the conflict but occasionally seek support from the village government; and those with no or little ability are unable to resolve any conflict and always seek village government support once dispute occur

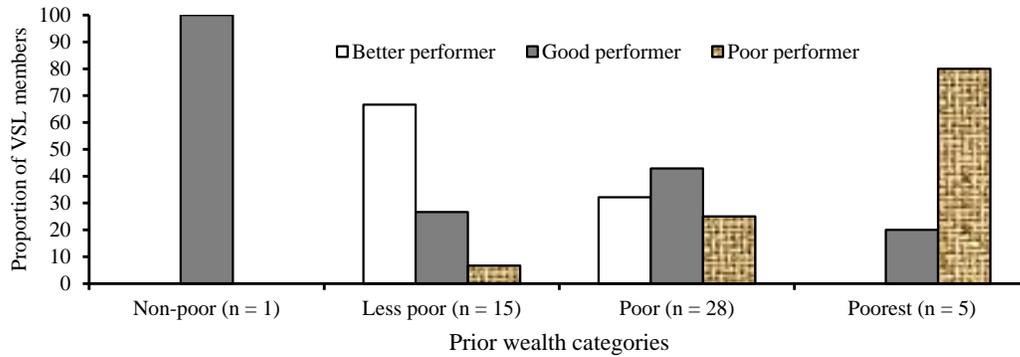
represented (**Figure 4**). This could be an indication that VSL tends to attract more non-poor and less poor than the poor and poorest.



**Figure 4:** Composition of the VSL members (a) and the general community (b) by their prior wealth ranks in Kanga village

There are studies that have reported non-participation of the poorest in microfinance (Hermes and Lensink, 2011). An important fact to note is that VSL has strived to attract the poor and poorest more than other similar microfinance schemes such as SACCOS. Thus compared to other types of microfinance institutions, VSL is potentially more effective in mobilizing the poor and poorest to access microfinance services.

Further analysis revealed significant association (Linear-by-Linear Association:  $\chi^2 = 9.676$ ;  $df = 1$ ;  $p = 0.002$ ) between wealth categories and performance of the VSL members (**Figure 5**). This means that those who joined VSL from the poor or poorest wealth category were more likely to perform poorly (and possibly more likely to dropout), than those from the rest of the wealth categories.



**Figure 5:** Distribution of performance of VSL members by wealth categories

An additional finding is that wealthier people may be inclined to join more than one group to maximize their access to savings and credit. Thus, while it may be possible to recruit poor and poorest in the VSL, maintaining their membership is still a challenge. **Interesting additional research would be to consider the impacts of homogeneity in terms gender and wealth category on performance.**

### 3.4.1 Negative factors for VSL

Negative changes reported in the MSC mirrored the livelihood struggles and challenges faced by the studied villages and were not perceived as attributable to iWASH interventions. In comparison with water supply component, the VSL was the least praised and there were few negative opinions about the VSL [Stories 29 & 52]. **Careful review of the compiled MSC stories (Appendix 3) suggests that those who narrated negative experiences with VSL were those who had inadequate entrepreneurship or business skills. They were therefore more likely to suffer problems or they anticipated suffering problems in the future once they divert VSL loans from the intended businesses to other uses.**

Explanations by Amina Abdallah of Kanga village was informative [Story 29]:

“...Starting with VSL, these are very bad; most people end up being poorer **because they do not use the loans as it was intended to be used**; their assets like farms are sold to recover the unpaid loan leaving them with nothing, others remains with debts when the value of their assets fail to offset the loan...”

**These negative narratives about VSL point two important lessons:**

- 1) Credit does carry risks and people are aware of it. However, inadequate awareness has also been a major cause of negative attitude towards VSL. As shown in **section 4.2** this fact was recapped in the theory-based evaluation workshop session in which participants maintained that inadequate outreach of the VSL scheme, especially to the poor or poorest community members and pastoralists, was seen as the weak link that constrained widespread impacts of VSL. Indeed, all of those who recounted negative experiences with VSL were those who were either poor [Story 29] or poorest [Story 52]

during inception of iWASH program. On the other hand, it is interesting to note that the negative notion about VSL did not change even for the individual who experienced tremendous improvement in wealth from poorest to non-poor during iWASH implementation [**Story 52**]; and

- 2) There is perhaps a problem with the way iWASH has been engaging with communities to promote VSL. The approach used is to organize community inception meetings in which the communities are informed about the opportunity for people to join VSL. It is not until the groups are formed that further that further information and training is provided; and even then only group members are legible to training. The approach is likely to induce non-poor and less poor, who attend inception meetings, to apply to join the group while the poor and poorest may not apply. This can lead to self-selection bias of the non-poor and less poor. Approaches that provide adequate information on VSL opportunities to the overall communities prior to VSL group formation may help to bring the poor on board. More studies are still needed to understand relative benefits and risks.

### 3.5 Impact of the iWASH Sanitation and Hygiene Component

The sanitation and hygiene component aimed at mobilizing the community around principles of sanitation and hygiene, had some direct impacts on health or indirect on education (see next sub-section for information on encouraging investment in sanitation at the household level). The reported impacts of sanitation and hygiene fall under two major domains of change:

- (i). Decreased incidences of diarrhoeal diseases, and
- (ii). Increased school attendance or motivation for school children to be in school.

The impacts of sanitation and hygiene component were more pronounced among children than adults. Of the 68 adult interviewees only one (1.5%) [**Story 41**] perceived impacts related to sanitation and hygiene component compared to six out of 13 school children [**Stories 71, 72, 75, 78, 79 & 80**], which is equivalent to 46.2% of all school children interviewed.

Both adults and children linked the impacts of sanitation and hygiene on decreased incidences of diarrheal diseases among children [**Stories 41, 72, 75, 78 & 79**]. The following were their narrations;

Magreth Jonja Buma from Kanga village [**Story 41**]:

“...we had no latrine and did not know how to wash our hands nicely with soap... CARE people; they trained us on importance of improved latrine and hand washing; my grand children got the same trainings at school... to construct a new house and an improved latrine you see here;..my grand children suffer from diarrhoea no more. I thank CARE and iWASH that have changed our life...”

John Paul, a school child from Pemba primary school [**Story 72**]:

“...We used to have worse toilets that did not have water. We used grasses or papers to clean ourselves after visiting toilets; this made me and my friends to get dysentery several times. iWASH has brought us nicest toilet;...we no longer suffer any stomach disease...”

Jakaza Adam, a school child from Kanga primary school [**Story 75**]:

“...Also there is no more cholera... the latrine are better nowadays and iWASH people have trained us on how to wash our hands with a soap before meals and after toilet visits...”

MatesoBakari, a school child from Pemba primary school [**Story 78**]:

“...We got nice latrines you see here at our schools... My farther constructed a nice latrine at home;... I also wash my hands after visiting toilet and before meals...”

MwajabuHaji, a school child from Pemba village [**Story 79**]:

“...iWASH came and brought tap water at school and our home, the same for good latrines. My father has constructed a new good latrine equipped with a hand washing facility... These are important changes that I have seen in our village...”

The presence of ‘nice’ latrines at schools through the support of iWASH program was perceived to be one of the motivation factors to keep children in school [**Stories 71 &80**]:

Gabriel Emily, a school child from Pemba primary school, reported joyfully [**Story 71**]:

“...Our school used to have dilapidated toilets;...iWASH brought... constructed very nice toilets you see in our school. Nowadays, we really enjoy life at school; we are using very nice toilets never seen anywhere in our community; also typhoid and dysentery have become things of history...”

Jannet Pascal, also a school child from Pemba primary school, expressed her hope [**Story 80**]:

“...slowly changed my mind; this place could be a better place to stay. We had no latrine but now have nice latrine at home and my father has acquired additional farm... We did not know how to keep ourselves and the environment clean, now we have been taught how to observe cleanness and wash our hands after toilet visit and before meals. We did not have nice latrine at school, now we have two blocks of latrine: one for girls and one for boys. All these good things have been possible through iWASH, we very grateful to them...”

It seems unlikely that improved latrines measured by school attendance alone would result in any measurable any improvement in education performance: there many other challenges to improve education performance including inadequate number of teachers, poorly qualified teachers and inadequate education materials. This was of special concern in Pemba village. Consequently, although the potential for improved education related outcomes as a result of access to improved sanitation facilities in schools was pertinent its achievement is constrained by fundamental unfavourable school factors notably availability of teachers [e.g. **Stories 64 & 69**].

Narration from one adult interviewee, Yusuph Mbega of Pemba village, accentuates this proposition [**Story 64**]:

“...I transferred my wife and children to Turiani town because I feared that my children would fail their studies due to inadequate teachers in our school...”

Abubakar Salum, a school child from Pemba primary school, reiterates [**Story 69**]:

“...I do not come to school tired as before; no more sleeping in classes. Nevertheless, I do not see much progress in studies. We are still facing a serious problem at school, teachers are few in number and they just can’t afford to assist the whole school. When I grow up I want to be a teacher in order to support my parents...”

Rehema Ally, a school child from Kanga primary school, supported the same proposition with reference to Kanga Secondary school [**Story 81**]:

“...I am struggling to study hard; perhaps this will give me the way out; if I pass primary education exams I will continue with secondary education. I do not want to study at Kanga secondary school because teachers are inadequate there; students in that school fail their national examination every year...”

Amina Abdallah, adult interviewee from Kanga village, complained [**Story 29**]:

“...We do not see any benefit from Secondary School, it is just like a picture; teachers are inadequate and our children never pass national exams....”

Positive changes in education outcome were reported from Kanga primary school, which had not received any school WaSH intervention. Rehema Ally, a pupil from Kanga primary school reported positive changes in education [**Story 81**]:

“... there some good things that happened at our school too; Room to Read project built two classrooms and one library, they also brought 90 desks for our school. We enjoy these facilities at school, we are very happy. I would like to go up to secondary school and become a primary school teacher...”

This implies that factors related to the quality of education delivery are more important in determining education outcomes rather than school WaSH. **Thus, in the future it is important to integrate school WaSH with other education interventions if education outcomes are to be achieved.**

### 3.6 Impact of the iWASH Household Sanitation Investment Promotion

In terms of impacts realized, investment in household sanitation was perceived as the least successful iWASH components. This correlates with low adoption of improved latrines in the studied communities.

Results from wealth ranking exercises conducted in the studied villages (see **Tables 2 & 4; Appendix 2**) highlighted how the poor and poorest are often unable to afford even the low cost improved latrine design (Sanplats currently cost around 7,000 TSH each). In addition, review of the MSC stories (**Appendix 3**) revealed that low incomes were among the factors that constrained adoption of improved latrine, even though many people within this wealth category acknowledged being aware of the importance of improved latrines.

**It was clear that availability of disposable incomes was more important in determining whether a household construct an improved latrine than awareness or knowledge on the importance of improved latrine.** One interviewee, Abdallah Muya from Kanga village, complained that inadequate incomes due to old age and illness constrained him from constructing an improved latrine, he and his family continued to defecate in bushes even though they knew the importance of improved latrine and public health hazards associated with “open defecation”. He said [**Story 59**]:

“...We have been educated that defecating in bushes is dangerous to our health and the public. However, we do not have enough labour leave alone money required to construct a latrine; we continue defecating in the bush even though we know the repercussions. Life is difficult for me and

my family; we would be happy to receive a help from the government and other good Samaritans out there. If I were to get well I would resume farming as before and my life would revive....”

**Further analysis of the MSC stories shows that most people start to think of constructing an improved latrine only when they have seen improvement in their livelihoods.** Jeremias Kanuti from Pemba village who experienced improvement in livelihood, from poor to less poor wealth category as a result of vegetable gardening, exemplifies this fact. He reported to have just thought about constructing an improved latrine experiencing positive changes in his livelihoods; and commented that there were many people who were in the same situation. These were his words [**Story 68**]:

“...With the coming of iWASH program in our village, life has become enjoyable to everyone in this village even though my family and many others are still struggling to construct an improved latrine...”

**This finding contradicts or suggests a reversal of the envisaged iWASH theory of change (Appendix 4), which was designed to stimulate adoption of improved latrine through trainings and awareness creation on sanitation and hygiene.** The theory of change assumed a linkage between adoption of improved latrines on health and economic outcomes: that adoption of improved latrine would reduce incidences of diarrhoeal diseases thereby making more household labour available for production. This would eventually lead to increased production and hence improved livelihoods. On the other hand, the logic of including VSL and MUS interventions was that improved livelihoods would help to invest and sustain WASH. In terms of implementation approach, the iWASH program has focused on intensive investment in sanitation and hygiene awareness creation and training events, which is expected to increase adoption of improved latrine.

**Therefore the assumptions behind the widespread investments in sanitation and hygiene awareness creation and trainings must be brought to scrutiny:** To the extent the results from this study represent the livelihood scenario in rural areas of Tanzania, it can be seen that future sanitation and hygiene interventions are likely to succeed if they will be carefully integrated with livelihood improvement interventions; It also raises the question of whether the latrine options being promoted are really “affordable”.

### **3.7 iWASH Causal Chain Analysis (areas for improvement)**

The relevance of iWASH interventions can be traced from beneficiaries’ own perceptions with respect to their prior problems around health and prosperity. This fact was extrapolated during the two days stakeholders’ workshop held with representatives of the various beneficiaries’ groups, which covered the theory-based evaluation and lessons learnt sessions. The responses on the challenges prior to iWASH interventions (**Box 1**) reiterated what had been recorded in individual beneficiaries’ MSC stories (**Appendix 3**).

**Box 1:** Reported challenges they faced prior to iWASH program by beneficiaries’ representatives

**Health challenges**

- (i). Inadequate institutional set up to regulate sustainable management of the water resources
- (ii). Regular outbreaks of epidemic disease such as cholera, dysentery and typhoid
- (iii). Inadequate access to improved latrines and hygiene practices especially use of hand washing facilities at toilets (*vibuyuchirizi*).
- (iv). Lack of knowledge on low cost latrine design (*visungura*)
- (v). Inadequate water supply where they were forced to drink dirty water
- (vi). Lack of knowledge of health and environmental conservation

**Economic challenges**

- (i). Inadequate entrepreneur skills
- (ii). Inadequate access to financial services
- (iii). Inadequate participation in large and small businesses

addressing their genuine livelihood challenges, and/or limitations. Weaknesses in the iWASH program components identified; which if they were to be improved or integrated in the program the impacts felt could have been greater (**Box 2**).

**Box 2:** Responses from beneficiaries' on weak aspects of iWASH program intervention package

**Health domain**

- i. Improvement in health service provision, especially governance of health systems ( commitment and accountability of health workers)
- ii. Training on accountability on health and environmental conservation among village leaders
- iii. Inadequate integration of water resource management with water supply, and/or sanitation and hygiene

**Economic domain**

- iv. Promotion of improved farming practices
- v. Improved livestock (cattle, goats and chicken) raising projects
- vi. Poorest and pastoralists were not adequately mobilized to participate in VSL and business

**Water resource management (Water User Association)**

- vii. WUA established without integration with other iWASH interventions such as sanitation and hygiene, and village savings and loan
- viii. Also WUA members depend on agriculture for their living but establishment of the WUA did not do anything to address challenges related to the existing farming practices

Based on the proceedings of the stakeholders' workshop and analysis of the MSC stories, one link was particularly identified as missing in the iWASH causal chain: relative low emphasis on improving farming, and/or livestock keeping practices. (Note: the activities are part of MUS but had just started during the period of these workshops).

Agriculture, and/ or livestock keeping are the major livelihood activities in the studied villages. This means economic resilience cannot be realized without paying attention to these major livelihood activities, anything that devastates these livelihood activities will eventually

jeopardize economic resilience. However, these aspects were largely neglected in the implementation of iWASH program.

iWASH Program envisaged having to tackle the problem of drought, a challenge acknowledged by the majority of people interviewed, through provision of water that could be used for irrigation. However, availability of water was not the only limitation: people needed support on irrigation techniques especially as there was virtually no agricultural or livestock extension worker to help them. Similarly, iWASH provided water for livestock, but pastoralists were also concerned with deterioration and scarcity of fodder, and increased incidences of livestock diseases which iWASH left unattended. (Note: the MUS component is ongoing and includes improved livestock husbandry).

Narrations from some interviewees clearly indicated that although they were happy to receive a solution for domestic water supply [e.g. **Stories 34, 40,42& 50**] and livestock [**Story 46**] their prosperity was constrained because other challenges facing their farming systems or livestock fodder, scarcity and diseases were unaffected.

Mahija Juma, a widow farmer from Kanga village registered her concerns [**Story 34**]:

*"...traditional farming methods can work no more so harvests are decreasing year after year; we hardly produce enough for the family leave alone surplus to sell for income. I do not see any significant improvement in my life; thanks to iWASH they brought clean water; yet farming that hold my life is left untouched..."*

Hassan Mohamed Mayoga, a farmer from Kanga village registered his concerns [**Story 40**]:

*"...The traditional farming methods we use are not working anymore; we do not have any agriculture extension worker in our village so there is no hope for gaining access to improved farming practices. The land close to the forest used to be wet, we tried to cultivate close to the forest hoping to harvest more but monkeys residing in the forest destroyed all our crops. I can see the future being blunt, something need to be done to our farming practices to make it withstand the recurrent drought..."*

Anastazia Exavery, a farmer from Pemba village forwarded her recommendation [**Story 42**]:

*"...Our life would be rescued if we get support on improved farming practices that withstand the decreasing rains; that would improve our harvests and incomes, and bring hope for prosperity..."*

Simon Stephano, a farmer from Pemba village registered similar concerns [**Story 50**]:

*"...Some few people have made use of the abundant water from the taps to cultivate vegetables in irrigated gardens, this seems to be our saviour but me and my family has not yet benefited. There is no any agriculture extension worker to help us with the needed technology to make use of the abundant water. I believe with time we will be able to learn from a few of us who have started gardening. In the future I plan to concentrate on gardening to cope with the hot sun weather, but the challenge I see is how to access the needed inputs leave alone the unfair pricing of our crops..."*

Pastoralists registered similar concerns as reported by Yakobo Paramisa, a pastoralist from Pemba village [**Story 46**]:

*"...Nevertheless, we still face challenges in our farming. We do not get much from farming due to drought, and soils are not good. We are using poor farming practices that cannot withstand frequent droughts and soil deterioration; fodder deterioration and livestock diseases are other remnant challenges. We need support to improve our farming practices and fodder quality, and sustainable control of livestock diseases in order to sustain good things initiated by iWASH..."*

The four key weak areas identified by participants were:

- 1) Neglect of some key components of governance challenges of rural health systems. Health problems of rural communities are not limited to diarrhoeal diseases;
- 2) Neglect of the special needs of the poorest and pastoral communities who were not adequately brought on board during mobilization especially with respect to VSL; and
- 3) Neglect of the role played by the village government in governance and supporting local institutions during and beyond the project life.
- 4) Water User Association established as an isolated entity without any clear linkage to other iWASH interventions.

## 4. CONCLUSION and LESSONS LEARNT

### 4.1. On the impacts

Based on perceptions of the beneficiaries, the activities under the iWASH program facilitated positive impacts on the livelihoods of the people through health, and livelihoods as exemplified by household production and income. The positive impacts were evident to 20% and 32% of the target population for health and livelihood impacts, respectively. Health impacts occurred through two mechanisms: 1) refrain from drinking unsafe water once clean and safe water is made available or generating water supply to dispensaries or health centres, and 2) adopt of improved sanitation and hygiene facilities and practices at schools and the general community. On the other hand, livelihood impacts occurred through three mechanisms: 1) increased production from labour that is saved from water fetching; 2) engagement in water-based economic activities; and 3) providing opportunities for access to investment capital through village savings and loan (VSL) scheme. In comparison to VSL and sanitation and hygiene components, improved water supply was an outstanding component through which positive impacts occurred in both domains of change accounting for 77% to 79% of the recorded positive impacts for livelihoods and health, respectively.

VSL played a role in improving livelihoods of the people; accounting for 23% of the reported improvement in their livelihoods. The positive impacts of VSL emanated from assurance for capital accumulation and to a lesser extent security of other important livelihood assets such as land. However, negative narrations about VSL were also encountered due to inadequate outreach especially to the poor or poorest community members and pastoral communities. Inadequacies in VSL mobilization approaches meant that the non-poor and less poor were motivated to participate at the expense of the poor and poorest; and even when the poor or poorest joins VSL the institutional arrangements tended to ruin their long-term legitimacy as they encourage their dropout. In conclusion, approaches that provide intensive VSL trainings to the overall communities prior to VSL group formation would help to bring the poor on board although more studies are still needed.

Apart from bringing positive benefits to people from all social groups, improved water supply provided the most effective means through which much of the reported significant positive livelihood changes happened. It accounted for 77% of the overall 32% of all interviewees who reported improvement in their livelihoods; the changes being mediated through creation of opportunities for water-linked productive activities especially gardening, brick making, local brew and food vending. As opposed to VSL, livelihood improvement opportunities through engagement in water-linked economic activities were equitable among different social groups. However, there is much scope for improving the impacts of improved water supply through effective integration with agricultural extension services, and/or other priority livelihood sectors in a given locality. iWASH is now implementing this under the MUS approach.

No longer drinking polluted water as a result of improved water supply accounted for 79% of the reported reduction in incidences of diarrheal diseases. This was in comparison to only 21% of the health impacts that were attributable to adoption of improved latrine or improved sanitation and hygiene practices. This could mean that most of the beneficiaries may not be motivated to construct improved latrines once they have assured of access to safe and clean water supply.

Furthermore, the assumption that investments in awareness creation and trainings on sanitation and hygiene would stimulate adoption of improved latrine is refuted. Availability of incomes turned out to be the most important determinant of adoption of improved latrine, rather than the levels of knowledge or awareness of principles of sanitation and hygiene. The poor and poorest are often unable to afford even the low cost improved latrine designs, even though sanplats currently cost around 7,000 shillings each. Thus, to the extent the findings from this study represent the livelihood scenario in rural areas of Tanzania, it can be seen that future sanitation and hygiene interventions are likely to succeed if they are effectively integrated with livelihood improvement interventions.

#### 4.2 Relevance, causation and lessons learnt

The success and failures of iWASH program based on points of view of the village level beneficiaries are summarized in **Table 10**.

**Table 10:** Perceived success and failures of the iWASH program

| Success   | Reasons for success   | Failures  | Reasons for failures   |
|---|---|---|--|
| <ul style="list-style-type: none"> <li>Increased knowledge on sanitation and hygiene among community members: construction and use of low cost improved sanitation facilities (<i>visungura</i>) and simple hand washing equipment</li> </ul> | <ul style="list-style-type: none"> <li>Extensive community mobilization: trainings and awareness creation</li> <li>Community members readiness to put into practice the knowledge gained</li> <li>Active participation of communities at</li> </ul> | <ul style="list-style-type: none"> <li>Inadequate animators and social mobilizers limited the number of people reached especially for hygiene and sanitation interventions               <ul style="list-style-type: none"> <li>⇒ Trainings on sanitation and hygiene, and VSL were only available to the minority<sup>14</sup>.</li> </ul> </li> <li>Mobilization and trainings did not reach the poorest and pastoralists<sup>15</sup></li> </ul> | <ul style="list-style-type: none"> <li>Animators and community-based trainers had little or no incentive to engage in effective community mobilization</li> <li>Occasional delays in completion of the planned projects activities</li> <li>The role of teachers in community mobilization was not recognized</li> <li>Unclear guidelines for establishment and formalization of WUAs</li> <li>Weak collaboration between</li> </ul> |

<sup>14</sup>This was a specific observation from community representatives but did not surface in other groups of participants

<sup>15</sup>The point on pastoralists is specific to Kanga village. In several occasions during the study, village leaders from Kanga made negative accounts about pastoralists that they were intruders in the area. The final workshop did not include pastoralists from Kanga village because the village leaders had demoralized them. An important point to

|  |   |  |  |
|--|---|--|--|
| <ul style="list-style-type: none"> <li>• Increased access and use of clean and safe water</li> <li>• Reduced incidences of diarrheal diseases</li> <li>• Increased income for VSL members as a result of access to investment capital</li> <li>• Increased capacity among WUA leaders and members to manage and protect water resources</li> </ul> | <p>all levels (village leaders, community groups and the general community)</p> | <ul style="list-style-type: none"> <li>• Sub-village leaders were not brought on board even though they are the ones closest to the communities within the village governance framework</li> <li>• Delayed registration of Mkindo Water User Association limited their opportunities to engage in active management of the water resources</li> <li>• Some dispensaries and health centres has no improved latrines up to now yet nurseries and other health workers are expected to spearhead awareness creation on sanitation and hygiene</li> </ul> | <p>the local government and iWASH program implementers</p> |
|--|---|--|--|

In terms of success, the highlighted points coincide with the two major impact areas of health and economic resilience linked to reduced incidences of diarrhoeal diseases and VSL, respectively. However, participants perceived that they were not convinced that Community Owned Water Supply organizations (COWSOs), community animators and water point management groups could sustain services. Whereas iWASH envisages these community institutions being the focal points of sustainability. Representatives from such institutions explained that they would continue to promote iWASH interventions only if they are given incentives. Representatives of the ordinary community members, the majority, insisted that they did not see any institution that can continue to promote WASH interventions after the project.

iWASH program interventions were relevant given the evident problems around health and economic domains that prevailed before program interventions. However, is scope for improvement in the program design based on the envisaged iWASH program theory of change. One weakness was the relatively late implementation of interventions to support farming, and/or livestock keeping practices even though they were identified to be major livelihood activities in the target communities prior to inception of the program. Of the weaknesses identified by the community in : 1) special needs of the poorest, and of pastoral communities; 2) important roles played by the village governments; and 3) the philosophy of integrated water resource management at community level, probably still warrant further investigation.

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note is the fact that village leaders from Pemba village were actually living harmoniously with pastoralists in the area, which could be the best place for learning how to live in harmony with pastoralists.

These negative narratives about VSL point to community awareness of the risks of credits and possibly the need for more information and awareness raising prior to VSL group forming. As it was seen in **section 4.2**, this fact was recapped in the theory-based evaluation workshop session; in which participants maintained that inadequate outreach of the VSL scheme, especially to the poor or poorest community members and pastoralists, was seen as the weak link that constrained widespread impacts of VSL. Indeed, all of those who recounted negative experiences with VSL were those who were either poor [**Story 29**] or poorest [**Story 52**] during inception of iWASH program. On the other hand, it is interesting to note that the negative notion about VSL did not change even for the individual who experienced tremendous improvement in wealth from poorest to non-poor during iWASH implementation [**Story 52**].

There is an issue with the way iWASH has been engaging with communities to promote VSL. The approach used is to organize community inception meetings in which the communities are informed about the opportunity for people to join VSL, but training is not provided until groups are formed, and then only group members are legible for such trainings. The approach is likely to induce wealthier community members to join VSL groups, while the poor members may not. This can lead to self-selection bias of the wealthier members of the community. Approaches that provide more information and trainings prior to VSL group formation may help to bring the poor on board.

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## APPENDICES

### Appendix 1: Checklist for semi structured interviews

| a) Questions for children interviewees  | b) Questions for adults interviewees   |
|---|--|
| <p><b>a) Consent</b></p> <ol style="list-style-type: none"> <li>1. Do you (storyteller) want to have your name on the story? Yes [.....] No [.....]</li> <li>2. Do you (storyteller) want to have your story published in magazine or any public media? Yes [.....] No [.....]</li> </ol> <p><b>b) Actual interview</b></p> <ol style="list-style-type: none"> <li>3. What is your name? How old are you? How did you get your name, does it have a special meaning for your parents?</li> <li>4. When and where were you born? Where do you live and what is it like?</li> <li>5. Who are your parents and what do they do?</li> <li>6. Tell me more about your family. Do you have siblings, what are their names and ages?</li> <li>7. What are the hardest moments or challenges you or your family members face?</li> <li>8. What are some of your best memories?</li> <li>9. Do you go to school? What's the name of the school and what class are you in?</li> <li>10. Do you have favourite stories from school? What are your favourite things about school?</li> <li>11. Do you face any challenges at school?</li> <li>12. What do you do after school?</li> <li>3. Over the last five years, what have been significant changes (positive or negative) in your life (individual, family, entire community)? How did the changes happen? What caused the changes?</li> <li>13. Why do you think this story represents significant changes in your life?</li> <li>14. What do you want to be when you grow up?</li> </ol> | <p><b>a) Consent</b></p> <ol style="list-style-type: none"> <li>1. Do you (storyteller) want to have your name on the story? Yes [.....] No [.....]</li> <li>2. Do you (storyteller) want to have your story published in magazine or any public media? Yes [.....] No [.....]</li> </ol> <p><b>b) Actual interview</b></p> <ol style="list-style-type: none"> <li>4. What is your name? How old are you?</li> <li>5. Can you tell me about yourself and your family or children?</li> <li>6. How do you earn income?</li> <li>7. Over the past five years, what have been your greatest family's struggles or challenges?</li> <li>8. Are the struggles or challenges you face typical for other families or the rest of your community?</li> <li>9. How are your children impacted by family struggles?</li> <li>10. What are you doing to overcome the challenge/s?</li> <li>11. What support did you get to overcome your struggles or challenges? Who provided the support?</li> <li>12. Over the last five years, what have been significant changes (positive or negative) in your life (individual, family, entire community)? How did the changes happen? What caused the changes?</li> <li>13. Do you think this story represents significant changes in your life? Why?</li> <li>14. What are your plans for yourself, your family or children and your community in the future?</li> </ol> |

## Appendix 2: Community defined wealth indicators and criteria for communities in Kanga and Pemba villages

| Indicators for good life                | Wealth criteria  |   |   |  |  |   |   |   |  |
|---|--|---|---|--|--|---|---|---|--|
|   | Kanga village  |   |   |  |  | Pemba village                                     |   |   |  |
|   | Non-poor   | Less poor   | Poor  | Poorest  |  | Non-poor  | Less poor   | Poor  | Poorest  |
| Food security (number of meals a day)   | Not applicable   | Not applicable  | Not applicable  | Not applicable   |  | Three meals a day and can choose what to eat      | Two meals a day and may not choose what to eat, eat whatever kind of food available                         | One meal a day and have no choice of what to eat                  | Hardly one meal a day and completely have no choice of what to eat                           |
| House                                   | Iron roof, cement floor and burnt bricks walls                                   | Iron roof, dust floor and wall made of pole and withies   | Grass thatched roof, dust floor and wall made of pole and withies | Dilapidated houses made of grass thatched roof, dust floor and wall made of pole and withies |  | Iron roofs, cement floor and burnt bricks walls   | Grass thatched roof, dust floor and wall made of pole and withies   | Grass thatched roof, dust floor and wall made of pole and withies | Dilapidated houses made of grass thatched roof, dust floor and wall made of pole and withies |
| Business (income generating activities) | Engaged in milling machine, shop and transport service operation such as minibus | Food vending ( <i>mama/babalish e</i> in Kiswahili) and trading in agricultural crops especially vegetables | In most cases depend on casual labour for income generation       | Entirely depend on casual labour for income generation                                       |  | Engaged in milling machine and shop <sup>16</sup> | Food vending ( <i>mama/babalish e</i> in Kiswahili) and trading in agricultural crops especially vegetables | In most cases depend on casual labour for income generation       | Entirely depend on casual labour for income generation                                       |
| Size of land owned                      | Own five (5) or more acres of land   | Own 3 to 5 acres of land  | Own 1 to 2 acres of land  | May own up to 1 acre of land but some are landless   |  | At least 10 acres                                 | Own 3 to 5 acres  | May own up to 1 acre of land but some are landless                | Most of them are landless but a few may own up to half an acre of land                       |

<sup>16</sup>Transport service operation business is not found in Pemba village, which happen to have poor roads

| Indicators for good life         | Wealth criteria   |   |  |   |               |   |  |  |   |
|----------------------------------|---|---|--|---|---------------|---|--|--|---|
|                                  | Kanga village   |   |  |   | Pemba village |   |  |  |   |
|                                  | Non-poor  | Less poor   | Poor   | Poorest   | Non-poor      | Less poor   | Poor   | Poorest  |   |
| Livestock <sup>17</sup>          | <p>a) <b>Farming communities:</b> 3 or more cattle, 5 or more sheep/goat and 10 or more chickens</p> <p>b) <b>Pastoral communities:</b> own 50 or more cattle, 50 or more sheep/goats and more than 10 chickens</p> | <p>a) <b>Farming communities:</b> 2 to 3 cattle, 1 to 5 sheep/goat and 5 to 20 chickens</p> <p>b) <b>Pastoral communities:</b> 30 to 50 cattle, 20 to 50 sheep/goats and 5 to 20 chickens</p> | <p>a) <b>Farming communities:</b> most of them have no any livestock but a few of them may own up to 5 chickens</p> <p>b) <b>Pastoral communities:</b> 2 to 5 cattle, 1 to 2 sheep/goats and up to 5 chickens<sup>18</sup></p> | <p>a) <b>Farming communities:</b> most of them have no any livestock but a few of them may own up to 2 chickens</p> <p>b) <b>Pastoral communities:</b> few may own 1 cattle, 2 sheep/goats and up to 2 chickens</p> |               | <p>a) <b>Farming communities:</b> own 10 or more cattle, 15 or more sheep/goat, 15 or more pigs and 10 or more chickens</p> <p>b) <b>Pastoral communities:</b> own 50 or more cattle, 50 or more sheep/goat and more than 10 chickens</p> | <p>a) <b>Farming communities:</b> 5 to 10 cattle, 10 to 15 sheep/goat, 1 to 2 pigs and 10 to 15 chickens</p> <p>b) <b>Pastoral communities:</b> 20 to 30 cattle, 20 to 30 sheep/goat and 5 to 8 chickens</p> | <p>a) <b>Farming communities:</b> most of them to have no livestock, a few may own up to 2 chickens</p> <p>b) <b>Pastoral communities:</b> 1 to 2 cattle, 1 to 2 sheep/goat and up to 3 chickens</p> | <p>a) <b>Farming communities:</b> do not have any type of livestock</p> <p>b) <b>Pastoral communities:</b> some may have 1 cattle and 1 sheep/goat but no chickens at all</p> |
| Ownership of means of transport  | Own 1 or more vehicle, 1 or more tricycle including <i>bajaji</i> , 1 or more motorcycles and 1 or more bicycles  | May own 1 motorcycle and 1 or more bicycles   | Few may own 1 bicycle  | Do not own any of the means of transport  |               | Own 2 or more motorcycles and 2 or more bicycles  | Most of them do not own any of the means of transport but a few may own 1 bicycle  | Do not own any of the means of transport   | Do not own any of the means of transport  |
| Ownership of an improved latrine | Latrines made of iron roofs, cement floor and burnt bricks walls  | Latrines made grass thatched roofs, mud or sanplate floor, and pole and withies walls   | Unimproved latrine that has poorly constructed superstructure made of grass or   | Do not have latrine at all  |               | Latrines made of iron roofs, cement floor and burnt bricks walls  | Latrines made grass thatched roofs, mud or sanplate floor, and pole and withies walls  | Do not have latrine at all   | Do not have latrine at all  |

<sup>17</sup>For the non-poor, chickens are less important as they are kept for leisure rather than an indication of wealth parse

<sup>18</sup>In pastoral communities, some poor households are working as casual labourers taking care of large herds of cattle for the non-poor or less poor keeping them in their homesteads (*bomas*) that you may wrongly think to be their property

| Indicators for good life                             | Wealth criteria  |  |  |   |  |                |           |      |         |
|--|--|--|--|---|--|----------------|-----------|------|---------|
|  | Kanga village  |  |  |   |  | Pemba village  |           |      |         |
|  | Non-poor   | Less poor  | Poor   | Poorest   |  | Non-poor       | Less poor | Poor | Poorest |
|  |  |  | coconut leaves or sacks serve as their latrines <sup>19</sup>  |   |  |                |           |      |         |
| Ability to access clean and safe water <sup>20</sup> | In the past, the non-poor and less poor were the only ones with access to safe and clean water. The poor and poorest were not able but nowadays even the poor and poorest have access to clean and safe water as a result of iWASH support |  |  |   |  | Not applicable |           |      |         |
| Education  | Can afford to take children to private secondary school <sup>21</sup>  | Can only afford to take children to public primary school and public Ward Secondary School but not private schools <sup>22</sup> | Can afford to take their children to primary public school but with difficulties in providing school uniforms and other requirements. Virtually unable to take their children even to the relatively cheap Ward Secondary School | A few may afford to take their children to primary public school but with a lot of difficulties in providing school uniforms and other requirements, and most of them may fail altogether to take their children to primary school. Unable to take their children even to the |  | Not applicable |           |      |         |

<sup>19</sup>Participants of the wealth ranking sessions in both villages were concerned that even the low cost sanplates sold at 7,000 is still too expensive for the poor and poorest households

<sup>20</sup>In Kanga village, participants noted that although they had listed access to clean and safe water as indicator for better life its importance was no longer valid. Whereas in the past only those with good life would access clean and safe water, the current increased access to clean and safe water as a result of iWASH interventions has meant that everybody in the village irrespective of life status is getting clean and safe water. Each household needs to pay a fee of one thousand per month to the respective water user group, which most community members can afford. For a few who are too poor to afford 1000 they are allowed to get water for free from their respective water user group.

<sup>21</sup>The type of school in which children attain primary school does not matter

<sup>22</sup>Ward Secondary schools (*Sekondari za Kata*, in Kiswahili) are renown for inefficient due to inadequate facilities including teachers

| Indicators for good life | Wealth criteria   |  |   |   |  |                |           |      |         |
|--------------------------|---|--|---|---|--|----------------|-----------|------|---------|
|                          | Kanga village   |  |   |   |  | Pemba village  |           |      |         |
|                          | Non-poor  | Less poor  | Poor  | Poorest   |  | Non-poor       | Less poor | Poor | Poorest |
|                          |   |  |   | relatively cheap Ward Secondary School                                |  |                |           |      |         |
| Health                   | Can afford health services from private hospitals such as Bwagara without having to ask for support from friends or relatives | Mostly use public health services but sometimes may afford private health services | Entirely depend on health services from public dispensary or hospital | Entirely depend on health services from public dispensary or hospital |  | Not applicable |           |      |         |

### Appendix 3: Significant change stories from Kanga and Pemba villages

#### Part 1: Stories from adults

**1. Story title:** Drought has made my life hard

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

I am Hashimu Madinga, I have 70 years old. I live in Lukindu sub-village in Kanga village with my wife with whom we were blessed with 11 children. All of my children have established their own family except one who live with me and is still depending on me. I was Ward Executive Officer from 1975 to 1979. Since then I have been just a normal farmer here in the village. I grow maize, rice, bananas and mangoes trees. I produce for food and sell the surplus to earn income for running life in my family. I also do beekeeping though to a small extent.

During this decade, rains have decreased and so have the crop harvests. Nowadays, I hardly produce enough to feed my family let alone enough surpluses to generate an income so my income has decreased a lot. Regular hunger has become a norm to my family and many other families in the village; we have reduced our number of meals from two to only one. I am no longer buying nice clothes for me and my family as before. Life has become tough! Two of my children could not attend secondary school as I could not raise enough money to pay their school fees due to drought.

Beekeeping needs high investment capital because we do not local artisans for making beehives; buying the beehives from Morogoro town is very costly. Honey harvests have reduced too because flowers for bee pollination are not enough as a result of drought.

Those are not the only consequences of drought: I had to sell my bicycle, chicken and rabbits in order to buy food for my family; our rivers have no enough water so irrigation is not possible.

The repeated drought incidences have caused backwardness in this area and many families are crying! Everything is not working now. I have no any practical option really but to continue with farming even though harvests continue to decrease. Other plans are to increase beekeeping, and try keeping chicken; I hear that Heifer people have introduced a new *kinengunengu* technology for keeping local chickens, I hope that will be very useful.

**2. Story title:** Drought and vermin deteriorate our livelihoods

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Malkus Mgya; I am a 50 years old. I live in Lukindu sub-village with my wife, six children and seven grandchildren. I and my family depend on farming for our living. We grow maize, rice and beans. I also do casual labour and gardening in the valley to supplement farm production. I sell the little surplus crop and vegetables to earn some money for the family. My life is not that good; my house is made of pole walls and grass thatched roof as you see.

The means for our life in our community are greatly constrained these days. Drought has increased over the last decade and this has come with resurgence of monkeys that destroy our crops altogether. The hot sun kills most of our crops and even the little that remains is destroyed by monkeys. Harvests are decreasing year after year.

Gardening has become less productive too because rivers are dry during dry season and soils cannot store enough moisture over a long period as before. Drinking water is still scarce too in our area.

iWASH brought modern rope pump wells in our village but we could not raise the cash contribution required to fulfil cost sharing as directed by the National Water Policy; so we missed that opportunity. We are still drinking water from our traditional wells that is dirty and so not safe for our health. On behalf of residents of this area, I would like to request iWASH to help us. I plan to increase my farm. I cannot do away from farming even though there is drought; but I will have to construct hedges around the farm to keep the monkeys away.

**3. Story title:** Drought hits widow's family

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

I am Neema Andrew, aged 32 years. I live in Lukindu sub-village in Kanga village. I am widow; my husband died in 2012 and left me with five children who depend on me. I am a farmer; I grow maize and beans. I also work in others' farms as a casual labourer to earn income.

The environment has changed these days; rains are not enough as they used to be. Every season the hot sun kills most of my crops, harvest are getting less and less. The little harvest cannot sustain my family for the whole year. Hunger is affecting my family every year; we only get one meal most of the time. All families in this village are affected because as we all cultivate in the same area. The future is really blunt for me; I have no option but to continue working hard in my farm. Perhaps rains will be good in the future; if good rains come back I will sell my crops and use the money to build a nice house and send my children to secondary school.

**4. Story title:** Water from rope pump wells help drive innovation and incomes

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Dotto Mohammed, aged 38 years. I am not married and have no children. I live alone here in Lukindu sub-village in Kanga village. I am a farmer: I grow maize, rice and cassava.

Water scarcity had become a challenge over the last three years or so; many sources got dry and we suffered a lot! I used to produce enough for food and surplus to earn income but things have changed these days. Farming is not meaningful as before, we do not harvest in this area because of escalating drought.

As the crop fails every year, I decided to start tree nursery and brick making since 2011. Thanks to iWASH, I use water from the rope pumps they have brought to our village to irrigate the tree seedlings and make bricks. I sell tree seedlings and bricks to earn income. These days many people have been educated to plant trees and they need bricks too for building modern houses. So the market for both tree seedlings and bricks is really encouraging. Thanks to the rope pump wells in our village enabling us to have water throughout the year I am assured of generating income even when crops fail. In fact I am getting more than what I used to get from farming even when the rains were still good. Last year, I sold tree seedlings and used the money to buy 15 iron sheets which I will use to build a nice house.

I like tree nursery business because it pays; I plan to expand the tree nursery next year in order to increase my income; I think I will apply for a loan from the bank. I don't know how life would look like without iWASH given the deadly drought! I am very grateful to iWASH.

**5. Story title:** Drought has halted development

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

I am Dionis Tarimo, aged 65 years. I live in Lukindu sub-village in Kanga village together with my wife and four children. I and my family depend on farming and livestock for our living. I grow maize in cowpeas in five acres farm; and sugarcane in nine acres farm. Besides I have five pigs.

Nowadays farming is not paying, we invest more than what we get out. Drought has continuously become severe over the last decade; we are getting hot sun for long and most of our crops either dry or are stunted. So the harvests decrease year after year. Despite all efforts my income has stagnated due to drought; I cannot take my children to private school as I had planned. We are not getting any support from the government; we do not even have an agricultural extension officer to help us with the appropriate inputs and better seeds that can withstand drought.

I plan to expand my farms if the government will bring inputs in time and provide us with tractors. I appeal to the government to bring us an agricultural extension officer who will show us the way to cope with this terrifying drought!

**6. Story title:** Drought faded all my dreams!

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Joseph Daudi Kibunga, I am 46 years old. I live in Lukindu sub-village in Kanga village with my wife and three children. I and my family depend on farming for our living. We grow maize, cowpeas and rice; and few coconut trees scattered in the farm. Besides I own about 20 chickens; and do local brewing. I used to keep goats but I sold all of them last year.

In the past rains were good and so income from sell of crop harvests; one acre of maize used to yield about 12 big sacks. Nowadays, you can hardly get one sack from an acre due to ever increasing drought. My income is decreasing year after year; I have nothing now. Last year I had to sell all of my goats in order to get money to send my children to school. If another emergency happens I will have no means to handle it; the 20 chickens won't help!

I thank God I planted some coconut trees that can withstand the drought. I sell coconut fruits to get some income; at least I have something even though it is not enough to sustain the family. This how life is in our village; I had dreams to build a nice house but all my dreams have been faded due to drought!

**7. Story title:** Gardening has revived my hope!

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Jacob Magonda I am a 45 years old. I live in Mzambarauni sub-village in Pemba village with my wife and three children. I and my family depend on farming for food and income. I grow maize, beans and cassava.

Drought has increased over the last decade, so harvests and incomes are continuously dwindling. Hunger has knocked the door of my family and many other families; sometimes I have no food to feed my children. During the peak of hunger we hardly take one meal a day. Sometimes I have to travel far away to other villages to do casual labour and get some money; I then buy food for the family.

Nowadays there are some improvements, iWASH has helped us. iWASH installed the water taps all over the village; water is plenty than before. Last year, I started to use water from the taps for gardening; I produce vegetables for the family and surplus for sell. The garden is an important source of income for the family, I am very thankful to iWASH. The garden has brought a new hope to me and my family. I plan to expand the garden to get more income; and build another house and start keeping cattle and goats.

**8. Story title:** Village savings and loan (VSL) brought hope to a widow

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is TausiBakari. I am a 28 years old. I am a widow; live in Mzambarauni sub-village in Pemba village with two children. I am a farmer; intercropping maize, beans, cassava and bananas.

Farming is not good nowadays; yields keep decreasing every year due to drought. I do not have enough food to feed my children most of the time; I do casual labour to get income for buying food but it is not enough. Hunger continues in my family.

I am very grateful to CARE who brought village savings and loan scheme in this area. I joined one of the groups this year; I save part of the little income I get. They trained us on business techniques. When this year ends it will be the end of the cycle for our group; I will take my share and start petty trading of clothes. I have seen other people who have improved their life through village savings and loan groups. I believe I will be able to make profit and my life will change. My plan is to continue with village savings and loan groups and cloth business; use the accumulated savings and profit to construct a nice brick house with iron sheet roof.

**9. Story title:** Plenty water has made a difference in life

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Rajabu Salum, I am 22 years old I live in Mzambarauni sub-village in Pemba village with my wife and our young baby. I did not go to school because I have grown up as an orphan, my father died when I was about 9 years old. I a farmer and grow maize and beans; also I do casual labour and make bricks to get money.

Hunger is affecting my family and many other families in the village; drought has escalated these days, so we do not get enough harvests. Last year I eat all of my harvests and left no seeds; this year I had no seed so could not cultivate enough land.

Availability of water through tap water system installed by iWASH has made a difference in life. It is easy to make bricks now than before; when water was scarce it was not possible to make bricks as all water sources in the vicinity were dry. With plenty water opportunities for casual labour have increased. In addition to casual labour in farms, I can do casual labour in brick making to get some money that I use to buy food.

**10. Story title:** Growing sugarcane and selling herbals helps to withstand drought

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

I am Juma Mganga, aged 77 years. I live in Mzambarauni sub-village in Pemba village, just alone in the family. I am a retired military officer, now just a farmer. I grow maize, beans and sugarcane. Also I am an herbalist specialized in helping women with problems of getting pregnancy.

These days harvests are not good due to drought; the harvests cannot sustain me over the year. However, I have never been a victim of hunger. I use the money from sugarcane and selling herbals to buy food; the income is just enough because I do not have any dependents. Last season I sold sugarcane and got enough money that I used to construct an iron sheet thatched house. As an old man I do not have any future plans except to continue tending my sugarcane farm that brings me money

**11. Story title:** Water is plenty, I can make bricks to get money

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Sijali Mathew, aged 18 years. I live in Mzambarauni sub-village in Pemba village with my wife; we do not have any kid yet. I and my wife are farmers; we grow maize and beans. I also do casual labour in other's farms to get money for my own expenses.

My income and food has decreased over the last five years due to drought; we are not getting good harvest as before. Many families in this community do not have enough to eat due to drought. I work in farms of my neighbours to get money to buy food.

iWASH have provided another opportunity, with plenty water in the village brick making has become one of income generating opportunities. I plan to start brick making in the coming dry season; I use the brick and income from brick selling to build an iron roofed brick house. Thanks to iWASH who brought water in our village.

**12. Story title:** Water is plenty but drought constrains prosperity

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

I am Yusuph Saidi, aged 25 years. I live in Mzambarauni sub-village in Pemba village with my wife and one child. I and my wife are farmers; we grow maize for food and beans for cash. I the

past farming was paying; sold beans and constructed a nice house you see here; I bought a bicycle and started business of selling clothes too.

Over the last two years things have changed; harvests are not good. Drought has become severe for the last consecutive two years; hunger has conquered my family and many other families in the village.

We have been lucky to get tap water, we are very grateful to iWASH program. We have clean drinking water but drought destructs our joy! I have to engage in casual labour, working in neighbour's farm, to get money to buy food to feed my family. Unfortunately when the sun is too hot like this year; there are no casual labour deals. Life is just difficult!

**13. Story title:** Water helps a divorced woman to withstand drought

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Sophia Mathias, aged 45 years. I live in Mzambarauni sub-village in Pemba village with six children. I divorced with my husband. I am a farmer and I grow maize, beans and cassava.

Over the last decade, drought has continuously become severe, it peaked since the last four years; we don't get enough rains nowadays. At the peak of drought water became scarce too, all water sources dried except few rivers and ponds far away at the bottom of the mountains. I used to spend almost the whole day walking and standing in queue waiting to fetch water. I had little time to work in other economic activities; I could hardly cultivate half of my farm. Besides, since then crops are not growing well and harvests has decreased dramatically. Life became precarious as hunger knocked the door of my family and many other families in the village.

I did not get any support from relatives or even the government did not do anything to help so I am very grateful to iWASH, they brought tap water in our village. The water taps with very clean water are everywhere in the village. We fetch water from near our homes, so we no longer waste time for fetching water. Now, I have more time to work in the farm but still yields are low due to drought; only those who own farms in the valley bottom do get good harvests still. I do casual labour to get money to buy food to feed my family. Also I have revived local brew business after getting tap water from iWASH; I had stopped due to water became scarce. Income from local brew business helps me to buy food for the family and meet other family obligations. Now that we have plenty water, I plan to start restaurant business because this place I live is a good site for restaurant business; I believe my income will increase.

**14. Story title:** Drought languishes prosperity

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Said Bakari, aged 31 years. I live in Mzambarauni sub-village in Pemba village with my wife and three children. I am farmer; I grow 20 acres of maize and 10 acres of beans. I also trade in bananas; I buy from farmers and sell to buyers who come to our village. I sell surplus crops to get income; I built this nice iron roofed house, you see, from the income I got from crop sales.

Since the last two years drought has become more severe; rains are not good as before. My income has decreased too because I do not get enough surplus crops to sell. If rains improve, I plan to decorate my house even more and start keeping cattle and goats.

**15. Story title:** Drought brought hunger

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

I am Angela Peter, aged 30 years. I live prosperity I live in Mzambarauni sub-village in Pemba village with my husband and four children. I and my family are farmers. We grow beans, maize and cassava. We sell surplus crops to earn income.

Over the last five years, our income has decreased. Rains have decreased and we harvesting less and less; we even do not have enough to eat; hunger! Many other families experience the same challenge. Life has become difficult indeed! I do not see any way out of this problem except to increase the farms so that at least we get enough to feed the family. If rains improve I hope to get more income and construct a nice house.

**16. Story title:** Gardening rescued my family from hunger

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Abobakari M. Kamboga, aged 27 years. I live in Mzambarauni sub-village in Pemba village with my wife and three children. I and my family are farmers; we grow beans, maize and cassava. I also keep chicken. We produce for food and sell surplus crops to earn income.

My income has decreased over the last five years with smaller harvests due to drought; we do not get enough surpluses to sell. We used to harvest thirteen to fourteen big sacks of maize per acre but now have decreased to only nine. Many other families in the village face the same challenge.

Hunger was about to knock my door but iWASH saved me; I use water from the tap water to grow tomatoes and amaranths. I sell the vegetables to get income to buy food; my family never

goes hungry even though the income is not enough for other commitments; thanks to iWASH! I plan to increase the farm size and use drought resistant maize and beans varieties. Also I will start crop business; buying crops at lower prices during harvesting time and sell later when the price goes up.

**17. Story title:** Drought brought hunger

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

I am Amina Rashid; I am 32 years old. I live in Mzambarauni sub-village in Pemba village with my husband and two children. I and my husband are farmers, we grow maize and beans. We produce crops for food and sell the surplus to earn income.

Nowadays harvests are not good due to drought. Our income has gone down too and worse enough we even do not have enough to eat. We do casual labour to get money for buying food. This challenge has become common now in my family and many other families in the village. I think some few families are getting good harvests. We are left with no hope, except to open a new farm in the forest close to the mountains where the soil is fertile and moisture is high most of the time, but this is sustainable in the long-term.

**18. Story title:** My family has resorted to eating cassava due to drought

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 11/03/2013

My name is Fatuma Waziri (Mrs JumaSeleman), aged 25 years. I live in Kinyambogo sub-village in Pemba village with my husband; no any child. I and my husband are farmers; we grow maize, beans and cassava.

In the past we used to get harvests, we sold our crops to raise enough income and built this nice iron sheet roofed house even though walls are made of poles. Nowadays, the harvests are not good due to drought; our income has gone down too. I thank God we still have something to eat even though we are forced to eat more cassava flour than before. If the weather improves we plan to expand our farms and improve our house to brick walls.

**19. Story title:** Drought brought hunger

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 11/03/2013

I am Abeid Said, aged 36 years. I live in Kinyambogo sub-village in Pemba village with my wife and three children. I and my family are farmers, we grow maize and beans. We also keep goats, we have six of them. We produce for food and sell surplus harvests to earn income.

Harvests has been going down over the last two years due to drought, rains do not come in time as it used to be. I do not have surplus to sell, my income has decreased too. Many other families in this village experience the same challenge; we have no enough to eat. I do not see any practical way out of this challenge except to increase the size of my farm and start keeping cattle and chicken.

**20. Story title:** Drought has decreased my income

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 11/03/2013

My name is Juma Ibrahim, I am 60 years old. I live in Kinyambogo sub-village in Pemba village with two wives and nine children. I and my family are farmers; we grow maize, bananas and coffee. I also have eight cattle.

We do not get good harvests these days; rains are not enough since 2010. My farm is in the valley so I am not affected much; at least I harvest enough to feed the family even though my income has decrease as I hardly get surplus to sell. The problem is more serious to most of the family in the village; they are hungry as they do harvest enough to fulfil the food requirements. I plan to expand my farms and keep more livestock that provide incomes during the time of need.

**21. Story title:** Drought deteriorates care to elders

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 11/03/2013

My name is Ibrahim Seifu, aged 81 years. I live in Kinyambogo sub-village in Pemba village with my wife, two children and several grandchildren. I used to be a farmer but I have left farming to my children and grandchildren due to my old age. They grow maize and beans and provide me with food and clothes.

Nowadays rains has decreased, harvests are not good. I thank God, my children and grand children still harvest enough to feed us but they have no surplus left for sell. Their income has decreased too; I could not get new clothes last season as they had no enough money. At my age, I do not have any future plans except to wait for the support from my children and grandchildren.

**22. Story title:** Drought hits elders

**Domain of Change:** Economic Resilience

**Name of a person recording story:** Filbert Thadeo Sogomba

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 11/03/2013

I am Anthony Joseph Kitoga, aged 71 years. I live in Disanga sub-village in Pemba village with my wife. We were blessed with six children but they all established their families. I am farmer; I grow maize and cassava.

My cardamom farm deteriorated as I do not have enough energy to weed the farm. Nowadays I cultivate smaller and smaller farm due to old age, rains have decreased too; the harvests have decreased. Sometimes my wife and I have nothing to eat, but our children and grandchildren provide us with food. I do not have any future plans apart from praying for good health for me and my wife, and our children and grandchildren.

**23. Story title:** I have more time to work in farm and my shop

**Domain of change:** Economic resilience

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:**Mvomero

**Date of narration:** 06/03/2013

My name is Salma Hussein, I am 25 years old. I live in Kanga village with my husband and our five children. I and my family are farmers; I also do trading in my shop.

Water scarcity has been the major challenge in this area; all water sources were dry except those located far away at the bottom of the mountains. I and all other women and our children used to spend most of our time fetching water from far away.

I am very grateful to iWASH, they have solved the water scarcity problem. We have modern rope pump wells all over the village; we get water from just close to our home. We no longer waste our time in search for water. I have more time to do other important economic activities; I concentrate on farming and business now. We have expanded our farm even though drought persists, our income has stabilized. We plan to improve our house and take our children to better schools.

**24. Story title:** Despite of drought I can see the bright future

**Domain of change:** Economic resilience

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Salumu Musa Dilemwa, am 42 years old. I was born and I reside in Chalongwe sub-village in Kanga village. I retired from civil service since 1998. Now, I am a farmer and do some

business; I operate a small grocery where I sell some drinks and food. However, farming is the major pillar of my life.

Drought has increased and soils are exhausted too; farming is not as good as before, harvests have decreased. My income has decreased too, last year my children were expelled from school for some days because I could not pay the school fees in time.

Despite of the decline in income we still have a bright future; we have been lucky to get support from various development projects: CARE brought savings and credit scheme; Heifer has introduced better livestock keeping methods; and iWASH has supported us with rope pump wells close to our homesteads that provide us with clean water all the time.

I believe our life is going to improve sooner or later; I and my wife have more time to work in economic activities. In the past, my wife left all economic activities to me; she had to spend most of her time searching for water. We have joined our efforts now as the water scarcity problem is already solved; we are very grateful to iWASH. We plan to borrow money from VSL and expand our business; we will also keep livestock more profitably as we will use improved methods that Heifer trained us.

**25. Story title:** Despite of the challenge of drought we are moving forward

**Domain of change:** Economic resilience

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

I am Salim Mohamed, aged 54 years. I live in Chalongwe sub-village here in Kanga with my wife and four children. My life depends on farming, tailoring, and casual labour in sugarcane plantations to a lesser extent.

Rains have decreased nowadays; harvests and incomes have all gone down. Agricultural experts from the district council once introduced to us drought resistant maize varieties but the seeds are not available in time. Water scarcity used to be another pressing problem but it has been solved now; my wife used to spend all her time searching for water leaving all economic activities with me! Influx of pastoralists is another challenge; in fact we don't like them! Their cattle destroy our crops adding to low and low crop harvests.

Despite of all these challenges our life has improved; my wife is no longer spending her time fetching water as iWASH people have provided us with pump wells close to our homestead. I and my wife have joined our effort to concentrate on economic activities. Production and income have increased. We have been able to take our child to secondary school; added household furniture, new beds and mattress. Our plan is to expand our farm to raise income and send the remaining children to secondary school.

**26. Story title:** VSL has changed my life  
**Domain of Change:** Economic resilience  
**Name of person recording:** Lina Andrew  
**Region:** Morogoro  
**District:** Mvomero  
**Date of narration:** 06/03/2013

I am Anna Rashid Chazua, aged 46 years. I am a widow and I live here in Chalongwe sub-village in Kanga village with my three children; two boys and one girl. I do farming; and grocery and restaurant business to run my life and family. I was privileged to be elected as Ward Councillor and the allowance I get to add to my income. As a woman entrepreneur I do not find any problem to run my family even though I do not have a husband.

I have seen improvement in my business and life in general over the last five years. I got entrepreneurship trainings from village savings and loan scheme promoted by PEMA and CARE; I can plan and manage my business better than before. In the past it was difficult to get business capital; people had to sell their land to get business capital. This changed after introduction of village savings and loan (VSL) scheme; I got my business capital from VSL. Opportunities for business loan have even increased further; there are BRAC, SACCOs and the President Fund.

Furthermore, iWASH has provided us with rope pump wells all other the village. Water was scarce before and that affected the profitability of my restaurant business; my restaurant attendant used to spend much time in search for water but now she get water just a few metres from here. Restaurant sales have increased as a result of improved water supply; my income has increased too. I can provide my family with food and all other basic needs without any problem.

Many more opportunities have come; Heifer and iWASH trained us on improved methods for keeping chickens and goats; and use of water from the wells for vegetable gardening. Many people have established vegetable gardens; the gardens are flourishing because we have water to water them. All these changes have provided assurance to our future, the future is very bright.

I plan to buy my own private car, building a new house to do away with this clan house; and have enough savings in my bank account. As a community we have plan to renovate and expand our dispensary and upgrade it to a health centre; construct students hostel at the ward secondary school; we also want to trap water directly from the mountains, a gravity water scheme is more dependable! Some of the wells constructed by iWASH have dried up and we are afraid that many more wells may dry in the future.

**27. Story title:** Relieved from fetching water but have no say on the use of family income  
**Domain of change:** Gender relations  
**Name of person recording:** Lina Andrew  
**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is HadijaShidaChazua; I am 26 years old. I live in Chalongwe sub-village in Kanga village with my husband and two children. I and my husband are farmers; we sell surplus crops to earn income.

Water scarcity was a major challenge over the past two years. Drought became severe since five years back; all water sources in the vicinity dried. I had to walk long distances for the whole day to fetch water from the bottom of the mountains. I left all economic activities to my husband; production and income decreased as only one man's hand were available for production. About two years back, iWASH solved this problem. They helped us with modern rope pumps wells that supply clean water all over the village. I get water from just close to our homestead; I have joined my husband with farming activities; we produce more and our income has increased than before. There is another project that promotes improved methods for keeping livestock (hens, cattle and goats) but I don't know who brought the project because I am not a member of any livestock keeping groups.

These changes have not improved our life as it would be expected, I do not see any change in life apart from buying this plot in which we have build this hut we live in. My husband does not listen to me; he decides how to use our income on his own! For example when we harvest, once I tell him to sell our surplus crop and buy iron sheets to improve our house he refuses. He always says he has other important uses with the money; but he end up spending all the money on drinking and other unseen expenses. This challenge is common to many women in this village; most of our men have this behaviour; women are not supposed to make any decision in their households; husbands are not supposed to be told how to do things by their wives. Our children are affected too; sometimes my husband sell large portion of the harvest leaving us with hunger. When the food situation is harder I do casual labour rather than waiting for my husband to bring food. I have never received any support except advice from my fellow women friends who ask me to be patient on my husband behaviour as it is a common behaviour to many men here in the village. They also advise me to continue engaging in casual labour to up keep the family.

**28. Story title:** Water is plenty but drought and land ageing pull us back

**Domain of change:** Economic resilience

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is StamiliHemedi, aged 38 years old. I live in Kanga village with my wife and four children: two girls and two boys. I and my family depend on farming for our living. I also do casual labour to earn additional income and keep chicken that help me in times of need.

Harvests have decreased over the last five years due to combined effects of drought and soil deterioration. Income has decreased too, and we do not even have enough to feed the family. I and my wife do casual to get money to feed the family; sometimes we sell our chickens but all of these are not enough.

We had problem of water scarcity, the hot sun dried all water sources except a few near the bottom of the Mountains. My wife always used to spend whole day searching for water; all farming activities were left to me alone. We thank iWASH, they brought pump wells all over the village in the last two years; water is plenty now. My wife joined me in farming and other economic activities. We got another support from Room-to-Read project; they constructed two classrooms at our school. Our children have nice place to read. Despite of all these changes life has not changed, it continue to worsen; we cannot not harvest enough crops even when we expand our farms because the land has aged and the hot sun kills our crops every year. We cannot develop unless challenges in our farming systems are addressed; we have no extension worker to teach us farming methods that withstand drought; the government has not done.

**29. Story title:** No more fighting for water but savings and loan groups made people poorer

**Domain of change:** Economic resilience

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Amina Abdallah, I am 26 years old. I am married and I live here in Kanga village with my husband and two children. Our children are still young, the first born has just started standard one at Kanga primary school. We depend on farming to live; we grow maize, beans and sugarcane. We earn income from selling sugarcane; occasionally we do casual labour in others farm when situation are tough.

There have been several important changes in our life over the last five years. The major and touchy change is decrease in yields of maize and beans especially for the past two years due to scarcity of rains. Our family has increased too; God has blessed us with a new baby. Our income has increased even though we did not harvest maize and beans; our sugarcane plantation matured during this period, which we sold to get even more income than before. Other changes were establishment of savings and loan groups, livestock keeping groups, and construction of our secondary school.

We have also been supported with iWASH to construct rope pump wells in the entire village. Before these wells water scarcity was among the toughest life exams here; we had to walk the whole day to fetch water. The water scarcity problem has been solved, but there is a little issue with the rope pump wells; the ropes sometime break and make us suffer for sometimes.

There have been important changes in our lives even though some are negative. Starting with VSL, these are very bad; most people end up being poorer because they do not use the loans as it was intended to be used; their assets like farms are sold to recover the loan leaving them

nothing, others remains with debts when the value of the assets fail to offset the loan. We do not see any benefit from secondary school, it is just like a picture; teachers are inadequate and our children never pass national exams. Rope pump wells is the only intervention that has changed our lives a lot; we don't waste our time walking and queuing around water wells as before; no more chaos and fighting at water sources as before; life has become calm. We are very grateful to iWASH people for solving our big problem of water scarcity.

**30. Story title:** iWASH is like an angel to us, we got a solution for cholera

**Domain of change:** Health

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Francis John King'ondo, aged 60 years. I live in Pemba village with my wife and seven children. I have a good family even though my income level is little; we have good understanding amongst ourselves. I and my family are farmers; our income depends on farming. Sometimes we do casual labour in others farms when things are tough.

In the past water was scarcity; many water sources dried. My wife and children had to walk the whole day to fetch water; the little water we got was dirt. We used to get cholera and other diarrheal diseases. Over the past two years we have been lucky to have water taps all over the village; iWASH supported us to construct a tap water system from the source in the mountains. We are very thankful to iWASH; there are many villages around us who do not have clean and safe water. iWASH has been like an angel to us. Clean and safe water has changed our lives; cholera used to be a big problem to us for many years but now we got a solution.

We now have ample time to do economic activities; I plan to plant trees to conserve the environment and as an asset that my children will inherit. I want to start keeping pigs to complement incomes from farming that has become unstable due to drought; the market for pigs is growing in our village.

**31. Story title:** The burdens for pregnant women and school children are gone

**Domain of change:** Maternal health/improved education

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Agnes John. I am 30 years old. I live in Pemba village with my husband and six children. I and my family are farmers; we grow maize, beans, cassava and yams.

Our income has decreased over the last five years because there are no rains these days; also a certain disease has infected our yams. My family and many other families are hungry because what we harvest cannot sustain us over the entire season. We had hoped that yams would

resist drought and provide as with food but things has changed; even those we planted along water streams are infected too.

Water scarcity and diarrhoea used to be challenges in the past but they have been solved; a company called iWASH helped us to construct a tap water system from the mountains; water taps are everywhere in the village. We have plenty and clean water now. In the past caring for pregnant women was a big challenge; if you take a pregnant woman to the dispensary to deliver a baby you were required to carry water from your home. This burden to women has been solved; there are plenty and clean water from the taps at the dispensary. Similarly our children were always asked to carry water from home to school in the past; they arrived at school tired and could not follow classes effectively; they used to sleep in classes. Also many people used to suffer from vomiting and diarrhoea diseases because we were using dirty water; all these problems have been solved, we have clean and safe water from taps at our homes and at school. Children can now concentrate on their subjects instead of sleeping as before; vomiting and diarrhoea diseases are gone. We are very grateful to iWASH, we live peaceful life now.

**32. Story title:** There are more income opportunities and children are free from diarrhoea

**Domain of change:** Economic resilience/Health

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10/03/2013

My name is Lucas Basil, I am 45 years old. I live in Pemba village with two wives and nine children. I earn income through farming and livestock keeping.

We have suffered from water scarcity for the past five years; many water sources dried. Women and children had to spend hours walking to and from the bottom of the mountains to fetch water. The labour force for farming was reduced because those who went to fetch water would come back tired and unable to work in the farm. The water they got was dirt too, our children used to suffer from diarrhoea.

Nowadays, we have clean and safe water from taps spread all over the village. iWASH supported us to construct water tap system from the mountains. Our children are now free from diarrhoea, and women and children are available to work in farms; we are getting more harvests than before.

Furthermore, we have been trained in improved livestock keeping methods. Also certain group of experts came and mobilized us to start pig production. This will increase our income; life is going to be fine soon or later. I plan to build a new house and start business as soon as I harvest my crops this season. I also want to start keeping dairy cattle; keeping dairy cattle was not possible when water was scarce because cattle need a lot of water.

**33. Title:** Clean and safe water improves health

**Domain of change:** Improved health  
**Name of person recording:** Jackline G. Msuya  
**Region:** Morogoro  
**District:** Mvomero  
**Date of narration:** 06. 03. 2013

My name is AnastaziaStephano, 41 years old. I live in Lusonge sub-village here in Kanga village with my three children who are still in school. My elder son left for Loliondo in search for good life opportunities. I depend on farming to feed the family; I also keep chicken that I sell to get some money.

I and my children have experienced difficulties in life, things are not working. Chickens are no longer getting enough feeds when left to look for themselves, supplementary chicken feeds are good but they are far in Madizini town that I cannot afford the transport costs involved.

Drought has become frequent and severe and crops cannot grow well, harvests are decreasing over time. Also drought dried most of our water sources that used to be abundant in the vicinity. We had to walk long distances to fetch water, which was dirty and ruined our health; we suffered from diarrhoea and all sorts of stomach problems.

We are thankful to iWASH, it brought modern rope pump wells that are supplying us with clean water. Although a water yield is not good in most of the rope pump wells, we are assured of clean drinking water; all diarrhoea and other stomach problems are gone. We are now healthy. We are happy to have improved our health and done with the burden of wasting time and energy for fetching water from distant sources. I and my children are enjoying life even though we are still facing challenges of drought and inadequate chicken feeds. If these remaining problems can be solved, we can be sure of leading good life besides good health.

**34. Title:** More help needed to create suitable farming practices  
**Domain of change:** Economic resilience  
**Name of person recording:** Jackline G. Msuya  
**Region:** Morogoro  
**District:** Mvomero  
**Date of narration:** 06. 03. 2013

My name is MahijaJuma. I am widow aged 70 years. I lost my husband last year; I together with two children live with my elder son in Lusonge sub-village, Kanga village. My husband died when we had eight children; two died shortly after the death of their father; one left for Madizini town and other two went to Mwanza city in search for better life. Our life depends on farming. Life had already become hard even before the death of my husband. Over the last five years, rains have been decreasing continuously; traditional farming methods can work no more so harvests are decreasing year after year; we hardly produce enough for the family leave alone surplus to sell for income. I do not see any significant improvement in my life; thanks to iWASH they brought clean water; yet farming that hold my life is left untouched.

**35. Title:** Abundant water and agricultural inputs improves life

**Domain of change:** Improved health/economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06. 03 .2013

I am Robert Mahenge, 40 years old. My wife left me some years back; I live in Lusonge sub-village in Kanga village together with my mother and other four children. I and my family are farmers but I also do carpentry to earn income.

Over years we have experienced fewer rains, crops are not growing well and so crop yields have declined due to hot sun. Monkeys have also increased these days, they destroy the little crops that survive drought; we are left with nothing! Slowly but surely, farming is becoming less useful. We used to sell surplus crops to earn income but we have no more surplus to sell and we are even struggling the produce enough to feed the family; the little income I get comes from carpentry. The hot sun too dried all rivers and ponds in the vicinity; water scarcity added to the hardship. Women and children used to walk long distances and sometimes clashed at few remnant water sources; they were left with less and less time for other productive activities. Unfortunately, the water was dirty and many of us especially children suffered from diarrhoea each year. I had to work in the farm alone, production decreased even further. For years, I have been selling the little surplus at low prices just after harvesting to meet immediate family needs. This situation is further constraining my income. Prices normally go higher some few months after harvesting but I cannot wait as I need cash the most during harvesting time. Nowadays, we have seen some improvement in our life.

We were lucky to get support from the government through Participatory Agricultural Development Program (PADEP) and non-governmental organizations through integrated water, sanitation and hygiene (iWASH) program. PADEP helped us to construct cereal bank (*BankiMazao*, in Kiswahili) in which we store our harvest and use it as a collateral to access loans as we wait for good prices. Just before the last season, I store my harvest at the cereal bank and got seeds and fertilizers on loan from PADEP. Few months later prices rose, I sold the stored harvest and paid back the loan.

iWASH supported construction of modern rope pump wells that supplies clean water in every sub-village. My mother, young brothers and sisters are now fetching water from the rope pump close to our home. They have enough time to help me with farming activities. The water is clean too, so we are now free from diarrhoea. Last season, we joined efforts of all family members and cultivated more land. I used the fertilizers and improved seeds I got from PADEP, this time the crops survived the drought, we got good harvests. We had enough for the family and surplus too. I stored the surplus at the cereal bank again, and sold it at higher prices few months later. My income has increased now; we are at least enjoying life. Thanks to PADEP and iWASH.

### **36. Title: Clean water reduces diarrhoea**

**Domain of change:** Improved health

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06. 03. 2013

My name is Steven Maija aged 63 years old. I am the secretary for Lugonge sub-village here in Kanga village. I am married and we have six children but four of them have established their own families. We depend on farming to earn our living but it is not enough to sustain the family. The traditional methods we use are not working these days, yields are decreasing continuously. Rains has decreased too, water scarcity prevailed in the past. We are grateful to iWASH, they helped us with rope pump wells; there is at least one rope pump in each sub-village. Everybody is getting clean water. In the past, my family and many other people especially children were suffering from diarrhoea due to dirty water. The clean water from the rope pump wells has helped to reduce water borne diseases. As a sub-village secretary, I would like to request iWASH to add more rope pumps as they are not enough, some of them do not yield enough water during dry season when the sun is hot.

**37. Title: Families starve in Kanga due drought**

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06. 03. 2013

My name is Rashid Haji, 33 years. I live in Lusonge sub-village in Kanga village together with my wife and three children. Farming is our means of living and we grow maize, beans and rice.

In the past, we used to produce enough to feed the family and sold surplus harvest for income. Things have changed now, we are not getting enough rains; the land is becoming tired and contains less nutrients. So we are no longer harvesting as before; we don't have enough to eat, we are starving! Traditional farming methods we use are no longer working. We would like to ask for support with modern farming methods and inputs such as tractors, but nobody is hearing our cry!

**38. Title: We are grateful for clean water but need more help with suitable farming methods for drought resilience**

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06. 03. 2013

My name is JumaHaji, 54 years old. I live in Lusonge sub-village in Kanga village with my wife and seven children. I and family are farmers; we grow maize for food, rice and sugarcane for cash crops.

Drought has become more recurrent and severe, our harvest are decreasing continuously and so our income. Farming has become less attractive; crops are not growing well due to hot sun. During dry season, the sun would dry all the rivers and other water sources from which we used to get water. Women and children had to spend their time and energy walking long stance and scramble for water from few distant water sources that remained. However, the water was dirty and diarrhoea cases were common especially among our children. My wife and most children were no longer helping me with farming activities; I had to do it for myself. I could not cultivate all the farms, and this combined with prolonged drought resulted in tremendous decrease in crop yields. For unknown reasons even monkeys in the nearby forest have become fiercer these days; pastoralists are entering in our area with their cattle; all of these destroy our crops adding to the already dwindling crop yields.

Recently, iWASH people came and mobilized us to dig and construct rope pump shallow wells in all sub-villages. We are happy to have dependable drinking water supply though the water yield is sometimes inadequate in some wells especially during dry season. My wife and children have been relieved from the tough job of fetching water; their labour is now available for farming; our farm size has increased but we are not getting much due to drought and vermin challenges. At least life has improved; our children are not getting diarrhoea any longer; life has improved even though at a slow pace. The positive changes we have witnessed could be even better if were to get hold of farming technologies that withstand the ever increasing drought.

**39. Title:** Drought halted development efforts

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06. 03. 2013

My name is AshuraAhamedi, 33 years old. I live in Lusonge sub-village in Kanga village together with my husband and four children. We entirely depend on farming to live.

In the past we used to produce some surplus that we sold to earn little income but nowadays all we produce goes in our stomach, no more surpluses to sell. Frequent drought is the cause of all of these. We have little farm compared to others; our life has become hard and hard over time as drought persists, all we see is backwardness; those who have enough land are somehow making it. I think the traditional farming technologies we use cannot work any longer; we need some improved method of farming but nowhere to get support. This season, all we have planted are drying out there because of the hot sun; our cry is support from the government and others.

**40. Title: Drought and vermin worsened my life**

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06. 03. 2013

My name is Hassan Mohamed Mayoga aged 42 years. I live in Lusonge sub-village with my wife and our three children. I and my family depend on farming for our living.

Our life has been deteriorating over time. Farming has become difficulty these days; drought has become frequent and more severe; our harvests are decreasing year after year. The traditional farming methods we use are not working anymore; we do not have any agriculture extension worker in our village so there is no hope for gaining access to improved farming practices. The land close to the forest used to be wet, we tried to cultivate close to the forest hoping to harvest more but monkeys residing in the forest destroyed all our crops. I can see the future being miserable, something need to be done to our farming practices to make it withstand the recurrent drought.

**41. Title:** CARE and iWASH changed my life

**Domain of change:** Improved health and economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06. 03. 2013

My name is Magreth Jonja Buma, 57 years old. I live in Lusonge sub-village in Kanga village with five grandchildren; the children have been brought here because their parents live far from the school than me, it is more convenient for children to go to school from here. I am a farmer and do food vending (*mama lishe*, in Kiswahili) to earn income.

My children provide me with money that helps me to take care of the grand children but they are not providing enough money. Over the past five years, I had problems of inadequate income to care my grand children, sometimes we had no enough food; my business was not doing well too. Besides, my grand children used to suffer from diarrhoea now and then as the drinking water was not only scarce but also dirty; we had no latrine and did not know how to wash our hands nicely with soap.

Just before the last year or so, we got trainings from CARE people; they trained us on importance of improved latrine and hand washing; my grand children got the same trainings at school. About the same time, iWASH supported us with modern rope pump wells you see in many parts of our village. We are now getting abundant clean water from the rope pump wells, life has become better. I was lucky to get trainings on business and savings; I joined village savings and loan group I borrowed money from VSL group and increased the capital for my business; my business is now doing better. Later on, I used the profit from my business and VSL savings to construct a new house and an improved latrine you see here; I have built another house that I rent out to earn additional income; my income has increased and stabilized. Life is now enjoyable; my grand children suffer from diarrhoea no more. I thank CARE and iWASH that have changed our life.

**42. Title: Drought brings impoverishment**

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 07. 03. 2013

My name is Anastazia Exavery, 50 years old. I live in Mgalai sub-village in Pemba village with three children. I and my family are farmers; we grow maize for food and beans for cash.

Over the last five years, rains have continuously become less; crops are not growing well. All we produce is for feeding the family, no more surplus to earn income. Earning money has become hard and hard in this village; when my children get sick I struggle to get them treated; dispensary is located far away in Madukani sub-village; besides I cannot afford the health service fees they charge. Our life would be rescued if we get support on improved farming practices that withstand the decreasing rains; that would improve our harvests and incomes, and bring hope for prosperity.

**43. Title: Abundant water improves our life but we need help to learn different farming methods**

**Domain of change:** Economic resilience

**Name of person recording story:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** March 10<sup>th</sup> 2013

I am Paul Mgoya, 69 years old. I live in Mgalai sub-village of Pemba village with my wife and two children. Other six children are now grown up and they have established their own families. I and my family are farmers, we depend on farming to feed the family and earn some income.

Over the last past five years, farming has become more difficult, yields are decreasing and we can hardly produce enough to feed the family; no more surplus for sell. We were advised to use improved seeds but these are becoming more expensive, which constrain profitability of farming activities even more. Besides, drought has become more frequent and severe; our crops dry up due to hot sun. Water scarcity worsened the situation, we had to divert our time and energy from farming in search for water from distant water sources; we could not farm all of our plots and harvests declined even more.

I thank iWASH and the community at large who joined efforts to construct the water system that supply water in the taps you see all over the village. We now have more time to work in our farms, we have increased the size of the farm cultivate from three to five acres now but the crops are not growing well because our traditional farming methods are no longer working, our energy and seeds are wasted! It is unfortunate that we do not have agricultural extension worker in our village, so we are ignorant about modern farming methods. I believe, with the plenty water we have now, if we could get support on modern farming methods and acquire crop varieties that withstand drought our life would be improved even more.

**44. Title: Inaccessible markets limits potential life improvement from abundant water**

**Domain of change:** Economy resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** March 10<sup>th</sup> 2013

I am Joseph Antony, 27 years old. I live in Dukani sub-village here in Pemba village. I am married to one wife and we have been blessed with one child. I and my wife are farmers. We grow maize as a food crop and beans as cash crop.

For a long time my life has been almost stagnant even though me and family work hard in our farms, we could not attained our goals. Our crops could not fetch good prices here compared to other villages with good roads, and this affected everybody in this village. The buyers who come to buy our crops here always demand low prices and we have no choice. Water scarcity was another challenge for the entire community. All water sources in the vicinity dried, we had to spend most of our time and energy to walk long distances in search of the water, my wife and other women wasted their time and energy in search of water. My wife left all farming activities to me, and production went down hence life at best remained stagnant. The water that we got was dirty and our child frequently suffered from diarrhoea or severe stomach pains. That was another burden, dispensaries are far in the next village, Kibati, and even worse we could not afford dispensary charges most of time.

Nowadays, roads have improved a bit; at least the Chinese motorbikes can cross to our sub-village, Mgalai. But this has not changed our life much. With the coming of iWASH, we have water taps everywhere in our village! My wife no longer waste her time in searching for water, she is now helping me with farming activities. Unity is power, production has increased now, and we use Chinese motorbikes to carry our crops to Kibati-Madizini road where we sell at slightly higher prices. Our family economy has improved, we have even managed to keep pigs besides farming, and we have twelve pigs now. If the roads were to be improved we would get even more profit from farming. Similarly, improvement in communication would help us gain access to market information and this too would further improve the life for my family and the community in general.

**45. Title: Abundant clean water emancipates pastoral communities**

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 07. 03. 2013

My name is Behengani Kadeko, aged 45 years. I live in Nyakonge sub-village in Pemba village with two wives and eleven children. I have been pastoralist for all my life, I keep cattle and goats. In the past, I used to sell milk and sometimes cattle to get money, which I used to buy food from farmers and meet other family obligations.

I and my family are facing hard life nowadays. For the past five years, rains are continuously becoming less and less. As drought continued grazing lands deteriorated, many rivers in dried; farmers got less and less harvest and food prices rose. We could no longer afford food to sustain our lives from livestock sales. The overall local production and economy systems were virtually destabilized, it nearly became a tragedy! As men took herds of livestock walking long distances to search for water, women and children did the same in search for water for domestic use and calves.

Recently, iWASH has helped us with clean water from taps distributed all over the village. As pastoralists, our sub-villages got special consideration and were provided with cattle troughs. With the iWASH support our lives has improved; we take our cattle to get water from the cattle trough that is close to the homestead (*boma*, in Massai language); women and children get water from the water tap close to the *boma* too. Now, our life is full of joy! These are not the only achievements, we have learnt farming; I and my family are growing maize and beans for our food; we are also using surplus water to grow vegetables in irrigated gardens. All Massai have experience the same improvement in lives. We do not have to sell our cattle to buy food all the time, thanks to iWASH that changed our life.

**46. Title: Abundant water supply instigates pastoralists to start farming and gardening**

**Domain of change:** Economic resilience

**Name of person recording the story:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 07. 03. 2013

I am Yakobo Paramisa aged 55 years old. I live in Nyakonge sub-village in Pemba village together with my two wives and thirteen children. I and my family have lived entirely as pastoralists for years. We kept cattle, sheep and goats but never grown any crop.

We used to sell our livestock to get money that we used to buy food from farmers who resides in other sub-villages of our village. Over the last few years drought has become more frequent, rivers and dried and grazing lands deteriorated. Water for domestic and livestock uses, and livestock fodder became scarce; but water scarcity was the most terrible of all problems. I and all other men in this area had to walk long distances with our herds of cattle searching for water; sometimes we would scope the river beds in the valley close to this area to get water for both domestic and livestock uses but that did not last longer. My wife and all other women and children too had to walk long distance in search for domestic water; everybody in the family was in difficulties. Besides, we do not have any veterinary services in our area so our cattle are getting diseases that reduce productivity. Food prices also escalated, cattle sales could no longer generate enough money to meet our long-term food requirements.

At the peak of all these challenges, two years back, iWASH came to this area and significantly solved all of these challenges; we have clean water from water taps for domestic uses and cattle troughs full of water all the time for our livestock. We now have more time to interact with farming communities, we have learnt how to grow crops; me and my family are growing

maize and beans to feed the family; we do not have to buy ever expensive food from farmers; we are no longer bothered by the food price crisis. As other many women in our community, my wife has used the opportunity of abundant water to grow vegetables in irrigated garden; our diet has improved as we eat vegetables, and we sell surplus vegetables to earn additional income. I never expected as pastoralists would enjoy life like this, thanks to iWASH. Nevertheless, we still face challenges in our farming. We not get much from farming due to drought, and soils are not good. We are using poor farming practices that cannot withstand frequent droughts and soil deterioration; fodder deterioration and livestock diseases are other remnant challenges. We need support to improve our farming practices and fodder quality, and sustainable control of livestock diseases in order to sustain good things initiated by iWASH.

**47. Title:** Abundant water enhances integration of livestock with farming and gardening

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 07. 03. 2013

I am Yohana Kinanda aged 32 years old. I live in Nyakonge sub-village here in Pemba village with my wife and one child. I and my family are pastoralists, we keep cattle and goats. We experienced recurrent drought that dried all water sources, there was no water for us and our cattle. We spent much of our time to walk long distances with herds of cattle in search for water, my wife and young children had also to walk long distances to search for drinking water.

Over the last two years, we received support from iWASH, the brought us clean tap water and constructed cattle trough that provide water for our livestock. Nowadays, we do not have to walk long distances to search for water; we have more time to engage in other income generating activities. We are using the time saved from fetching water to do farming, we grow maize and beans something we did not before; something is better than nothing even though drought limits incomes from crop production; besides my wife is making use of abundant water for gardening to produce vegetables that we sell to generate more income for the family. The water and the resultant new activities have increased income and expanded the overall base for the family livelihoods. We are very grateful to iWASH that facilitated all these good things.

**48. Title: Improved clean water supply for prosperity**

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10. 03. 2013

I am Emanuel Andrin, aged 38 years. I live in Ndeme "A" sub-village in Pemba village with my wife and our five children. Me and family we are farmers, we grow maize, beans and cassava that we use for food and sell to earn some money.

Over the last five years, we have been facing challenges due to unfavourable weather and soil deterioration in our farms; farming became difficult as we get less compared to amount of time and energy we invest. My income declined, I had no crop to sell because the harvest was only enough to feed the family. This became even worse as the water became scarce too; my wife and our daughters could not help me with farming, they had to spend much of their time walking down the valleys to fetch water for the family.

Just before last year, we started getting clean water from the water taps that you see everywhere in our village. We thank iWASH who mobilized and supported us to construct tap water system. Since then my wife and all of my children have ample time to help me with farming; we cultivate more land now than before. Although the yields are not much we are able to get surplus that I sell to earn income; last season I sold beans and some maize and used the money to build a new house you see here! My life has improved now, and I can see the future is very bright to me and my family.

**49. Title: Abundant clean and safe water fights diarrheal diseases**

**Domain of change:** Improved health

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10. 03. 2013

My name is MateiAntoni, 43 years old. I am married to two wives and we have been blessed with five children altogether. I live with one wife and two children here in Ndeme "A" sub-village in Pemba village; the other three children are living in Morogoro town with the second wife. I and my family depend on farming for our living.

Our life has worsened over the last five years; harvests are dwindling in our farms year after year because rains are not good these days. So we do not have surplus to sell to earn income. Besides, unfavourable rains caused drying of most of our water sources; water scarcity became another problem to everybody in this community; my wife and children absconded from farming; they allocated most of their time and energy to walk long distances in search for water; unfortunately all they got was dirty water that caused diarrheal diseases to our children. This worsened our harvests further as the sizes of cultivated farms decreased.

Just before the last year we were lucky to get tap water system through the support we got from iWASH. Clean water is abundant, water taps are everywhere nowadays. This change is significant because our health has improved; no more diarrheal disease; women and children have resumed farming activities even though drought is still letting us down.

**50. Title: Inadequate farming inputs counteracts life improvement from clean water supply**

**Domain of change:** Economic resilience

**Name of person recording:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10. 03. 2013

My name is Simon Stephano, 21 years old. I live in Ndeme “A” sub-village here in Pemba village. I am married and have one child. Despite some improvement, life is still hard to my family and many other community members. I and my family depend on farming for subsistence and income.

Over the last five years I and my family have experienced a fall in income; the sun has become too hot nowadays, our crops cannot grow well as before, soils too have become infertile and our traditional farming methods can work no more! The village leadership has contributed to push us further down, the subsidized improved seeds and other inputs from the government and other *Good Samaritans* never reach our sub-village; only few farmers, those who are well known to the leaders, get it! So, our harvest have become less and less, we have no surplus to sell to earn some money, even feeding the family is becoming harder and harder. Worse enough, we are forced to sell the little we harvest at lower prices decided by the buyers who come from town, I guess; we have no option because our roads are not good to transport our crops to good markets in town. Another challenge was drying of water sources in many parts of our village, my wife had to walk all the day scrambling for water from few ponds that were far from here. All farming activities were left to me alone, adding to less and less harvest. I had to take her turn when she was pregnant, so I know the secret of the hardship of water scarcity!

We are grateful to iWASH, it supported us to get water from the taps; something I never expected in a remote village like Pemba! Now, my wife helps me with farming activities; farm size has increased slightly but the weather is just too bad to realize an increase in harvest. Some few people have made use of the abundant water from the taps to cultivate vegetables in irrigated gardens, this seems to be our saviour but me and my family has not yet benefited. There is no any agriculture extension worker to help us with the needed technology to make use of the abundant water. I believe with time we will be able to learn from a few of us who have started gardening. In the future I plan to concentrate on gardening to cope with the hot sun weather, but the challenge I see is how to access the needed inputs leave alone the unfair pricing of our crops.

**51. Story title:** Drought has brought hunger, rope pump wells is our hope

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Edward Ngoje, born in 1957. I live in Sechambo sub-village in Kanga village with my wife and two children, John and Elizabeth. I am a farmer and I grow maize and beans.

We had good rains in the past but now things as changed due to indiscriminate forest clearing for timber and farm expansion. Significant forest area has been cleared by rich people who own large sugarcane plantations. Since 2010, drought has become severe and persistent; the hot

sun kills our crops before they mature, we are suffering from hunger. I struggle to sustain my family through casual labour but this is not dependable way of living.

I am happy that iWASH brought rope pump wells in our village. I plan to meet with my neighbours to discuss how we can utilize water from the rope pump to start gardening of vegetables in the valley. I believe the gardening can sustain us because we are sure of the market in the nearby Madizini town.

**52. Story title:** Better house from abundant water supply

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

I am Omary Said, aged 49. I live in Chalongwe sub-village in Kanga village with my wife and five children, two of them are my sister's children. Me and my family we depend on agriculture. We grow maize and beans; in good years we harvest up to 20 bags of maize per acre and when the year is bad the yield went to 5 bags.

We are experiencing frequent bad years these days. In the past we had thick and large forest that used to bring rains. We chopped down the forest to expand our farms; drought is recurring every year. The traditional farming methods are no longer working, our crops dry before they are ripe. I and my family don't have enough to eat most of the time; sometimes we eat seed reserves, so we have nothing to plant the following season! All citizens of this village have the same problem; we are on the same cry.

I always struggle to feed my family, I do casual labour to get food and income but that cannot sustain us. Crop failure is not the only challenge; by 2010 most of our rivers and traditional wells dried; a few that remained had dirty water. We had no option but to drink the dirty water. I and family were lucky; the river and well were close to my house. My wife and children did not get the trouble of walking long distances to fetch water; but many were struggling, they had to walk long distances. My children and many other children in the village got typhoid fever due to the dirty water.

Recently, the water scarcity problem has been solved. iWASH brought rope pump wells in each sub-village. Drought is still a big challenge, I wish we could get technical support to deal with drought; we could produce enough to feed our families. Nevertheless, life is better now than before. One of the rope pump wells is located in my field; I have used that opportunity to make bricks for my house. Now I have a nice house you see here; this is a very significant change in my life. To build a house like this for a mere villager like me is not a joke! I think this house satisfies me, I am somebody now! I hear that there is an opportunity to take loans from village and savings scheme, but my family is not happy with me taking loan. They are afraid that if I fail to repay the loan, it would be an issue for the whole family; our nice house could be seized.

**53. Story title:** Despite prolonged drought life continues

**Domain of Change:** Economic Resilience  
**Name of a person recording story:** Hope Kaiza  
**Region:** Morogoro  
**District:** Mvomero  
**Date of narration:** 06/03/2013

I am Rashid Hussein aged 28 years. I live in Kanga with my Sechambo sub-village in Kanga village with my wife and two kids. Me and my family we depend on farming. I also I keep goats and chicken; and trade in vegetables to get additional income.

I am facing a lot of challenges with my economic activities, life has become chaotic than before. Diseases are attacking my chicken, I have no idea how to handle it; we do not have any extension worker to support us technical assistance. Up to now, I do not know what is going to happen to my maize crop, rains are not dependable nowadays. But never mind, I know even if the maize crop fails life will continue. I can live on the vegetable trade!

I used to grow vegetables along the river but I could not continue due to drought. The river dried in 2009, I had to stop gardening. My income was shacked as even crop harvests were not good; sun killed all of our crops; hunger started to touched my family. iWASH brought us rope pump wells after we had suffered water scarcity for several years. Since then water is plenty; those who live close to the wells started vegetable gardening. Though I do not do gardening I make life out of the gardens of my fellows. I started vegetable trade last year; I buy vegetables from the local gardeners and transport them in Madizini town where I sell at lucrative prices. Nevertheless, growing maize and beans remain to be the most paying ventures. In case I get good maize harvest this season; I will increase my capital and start shop business.

**54. Story title:** *New joy has come*  
**Domain of Change:** *Economic Resilience*  
**Name of a person recording story:** Hope Kaiza  
**Region:** Morogoro  
**District:** Mvomero  
**Date of narration:** 06/03/2013

I am William Jackson, 50 years old. I live in Sechambo sub-village in Kanga village with my wife two children and two grandchildren. I and my family depend on farming.

In the past we had good rains and the crop harvests were good. However, since 2010 rains have become inadequate; and so farming has become difficult too. Yields have decreased except for those who own farms in valleys. Drought caused water sources to dry especially during dry season. We do not have enough to eat, we starve every year. Water became scarce too due to drought. My wife, other women and children used to walk long distances to fetch water from the mountains where the river begins.

In 2011, iWASH brought us a new joy. My wife and children can get water just near our home; iWASH constructed rope pump wells in each sub-village. Water is not only abundant but also clean; thanks to iWASH.

**55. Story title:** Drought ruins the happiness from *iWASH*

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Bakari Hussein, aged 55 years. I live in Kasauke sub-village in Kanga village with my wife and eight children. Me and my family have lived on farming for years; but it is cannot sustain us anymore.

Nowadays rains have become scarce; the hot sunny dries our crops and we harvest little or even nothing at all. Hunger has become part of life in my family; we normally survive on food aid from the government, but that is not enough. I have decided to do casual labour in sugar plantations to sustain my family. The hot sun dried rivers and ponds too; water scarcity became another issue; rivers and ponds close to the mountains were the only ones that remained with water throughout the year. Life was cumbersome during dry season; we had to walk up to the foot of the mountains to get water.

Water is now plenty, I thank iWASH who brought rope pump wells in our village; the tap is in front of my house. We do not have to waste our time searching for water. We use much of our time for farming; drought is jeopardizing our energy; we do not harvest so we continue to starve even though we have increased labour input in farming. Our future is blunt due to drought, I do not know what to do; I live according to the day because an empty handed man like me cannot develop any implementable plan.

**56. Story title:** *Now we are happy!*

**Domain of Change:** *Improved health*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Abubakar Hussein, aged 43 years. I live in Kisauke sub-village in Kanga village with my wife and six children, four are in school and two are still younger to be in school. I depend on farming and casual labour in sugar plantations.

Over the last five years, hunger has entered my family and the entire village now. We are experiencing recurrent drought; our harvests are not good, sometimes we get nothing! Water was a problem too especially during dry season; water fetching became involving because few rivers that had water throughout the year were very far from home. There were two *mdundiko*

pump wells for the entire village but could not serve the entire population. We had to use water from rivers even though it was dirty.

Now we are happy, we have several rope pump wells in each sub-village; one of them is nearby my house. The water is clean; we are assured of our health. We are no more suffering from typhoid fever and diarrhoea as it was. Thanks to iWASH for the rope pump wells that provide us with clean water throughout the year.

**57. Story title:** Drought and death of my chickens caused hunger

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is ShabanDafa, aged 45 years. I live in Kisauke sub-village in Kanga village with my wife and two children. Me and my family we depend on farming for our living;

I used to keep chicken too but they all died of unidentified disease. We have been experiencing drought in this area since 2010; rivers and ponds are dry during the peak of dry season except those located far way at the foot of the mountains. Harvests are not good and we are hungry (*tunakuwananja*, in Kiswahili) most of the time. I am struggling to earn some income from casual labour but that is just not enough to feed the family. I will have to continue with casual labour to sustain my family; though it is not enough but at least we cannot die of hunger.

**58. Story title:** Malaria reduced my income and caused a slight hunger in my family

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

I am ShabanHamis, aged 35 years. I live in Kanga village with my wife and three children. I depend on farming to feed my family and earn income. I grow maize and rice for food; sometimes I sell surplus harvest to earn some money. In good years, I normally produce 10 bags of rice and 8 bags of maize that enough to feed the family and earn some money.

During the last season I was suffering from persistent malaria; I could not cultivate my entire farm. Besides certain insect pests destroyed maize crop; the harvest was little compared to the past years; we have a slight hunger in the family and my income has reduced too. My plans are to buy or borrow more land; I want to produce more in the next season to get enough money to take my children to secondary school.

**59. Story title:** I cannot farm or construct latrine due to sickness and elderly

**Domain of Change:** *Economic Resilience and improved health*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is AbdallahMuya, aged 68 years. I live in Kisauke sub-village in Kanga village together with my wife and one child; unfortunately the child is suffering from long illness. I used to be a farmer but I am no longer involved in farming; I stay here in bed all the time due to chronic painful ulcers that are eating my leg.

My wife have very little time to work in our farm as she has to spend much of her time taking care of me and our son! Hunger and poverty surround our family. I happened to plant some coconut trees when I was young; occasionally we sell some coconuts to earn little income but that is just pea nut! I used to get food aids from neighbours but nowadays I receive very little or nothing; the neighbours do not harvest as before due to recurrent drought that conquered our village since 2010. We have been educated that defecating in bushes is dangerous to our health and the public. However, we do not have enough labour leave alone money required to construct a latrine; we continue defecating in the bush even though we know the repercussions. Life is difficult for me and my family; we would be happy to receive a help from the government and other good Samaritans out there. If I were to get well I would resume farming as before and my life would revive.

**60. Story title:** Drought has caused backwardness

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is JumaAbdallahNyambilo, aged 29 years. I got married to my wife last year; I live with her in Kisauke sub-village in Kanga village. As my father, I depend on farming for my living. I grow rice, tomatoes and cabbage in the valley. In the past farming was dependable; nowadays it has become less dependable due to recurrent drought since 2010; we do not get good harvest anymore. I am lucky to have acquired farms in the valley bottom, at least I harvest something. My father does not have farms in the valley bottom; so life is more difficult for him and his family. Still I have to shoulder the entire burden, I it is hard to move forward. When my father's family does not have enough to eat I have to support them with food or money. I plan to expand farms; and start business if I succeed to get good harvest this season.

**61. Story title:** The death of my husband impoverished me

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is HadijaMbwana, aged 70 years. I am widow residing alone in Kisauke sub-village in Kanga village. My only daughter lives in Morogoro and she is the one who provide much assistance to me. I depend on farming to earn a living.

Before the death of my husband we used to grow maize and rice; produced enough for us and surplus that we used to sell to earn money. After my husband passed away my health is not good; I suffering from all sorts of illness; my knee is aching since then. I no longer grow rice; I grow maize alone and production has decreased dramatically; I am facing hunger and poverty in general. Thanks to my daughter who takes care of me even though she leaves miles away in Morogoro town.

**62. Story title:** The husband left and drought came but I got capital and water to start local brew!

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is TibaMakube, female aged 42 years. I live in Dukani sub-village in Pemba village with four children; my husband went to Geita to find a job in gold mine since 2010. I depend on farming to sustain the family; but recently I have started local brew business. In the past water was like gold, many sources dried due to prolonged drought.

I used I used to wake up at mid night to go and fetch water at the wells trying to avoid long queue of the day time. I had little time to sleep, my husband was not there to help me so I could not cultivate large farm as before. Drought added to less and less harvests, hunger came in my family; sometimes my children would go to sleep without eating anything.

I am very grateful to iWASH, they brought tap water, and village savings and loan (VSL) scheme in our village. We now have plenty water, no more sufferings! After getting trainings from CARE, I joined Tegemea VSL group. I got loan for capital to start local brew business. I had an idea to start selling local brew before but it could not work out due to shortage of water. I really want to thank iWASH so much because without them I would not get water and capital to runs local brew business.

I will never forget iWASH! My business is doing well; I get 6000 to 7000 a week. With this local brew business, I have solved all basic family needs. I am able to feed my children with delicious food, something I could not afford before. I am enjoying life even though my husband is not with me; thanks to iWASH. My plans are to ensure better life and education for my children; and continue with VSL in order to expand my business.

**63. Story title:** iWASH has transformed our lives

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Mwajuma Ally Koloela, woman aged 48 years. I live in Dukani sub-village here in Pemba village with my four children; my husband divorced me since 2007.

I used to depend on farming to earn a living but I changed since 2005 due to aching legs. Nowadays I depend on selling East African fried breads (*mandazi*, in Kiswahili) and tea, which I can prepare while seated. My children are the ones farming to feed the family. Water scarcity has been the greatest challenge in our village at least for the past five years. Women were supposed to wake up as early as 2:00 am and go out to find water wherever it could be found even though water was dirty. My children had to take my cross of fetching water as I could not fetch water with these painful legs. It was a terrible experience; all economic activities were put aside in order to provide time and energy for water fetching. The ones coming from water fetching would be tired and so failed to do other important economic activities including farming. Some pretended to postpone farming activities hoping to resume the next day but they always found themselves unable to do anything! I do not know how to explain, but it was really a terrible situation!

The coming of iWASH has transformed our life in this village. We joined our efforts with iWASH, now we have water taps with clean water all over the village. One of the water taps is close to my house; the water is clean and we do not have to sacrifice our sleep for fetching water as before. I have more water for making bans and tea now; my children have ample time to work in our farms; we are producing more than before. We do not go hungry as it used to be. I thank iWASH, for the significant support they provided to us. Our future is now bright, I encourage my children to work hard in our farms; and if my grandchildren pass their primary education exam I am sure there will be enough money to take them to secondary school.

**64. Story title:** iWASH has changed life in Pemba village

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

I am YusuphMbega, aged 36 years. I live in Dukani sub-village here in Pemba village. I am married to one wife and we have been blessed with three children. I transferred my wife and children to Turiani because I feared that my children would fail their studies due to inadequate teachers in our school.

I am doing shop business to earn my income; my shop is the biggest in the village. Besides, I do farming but use casual labourers to work in my farm. Life challenges that we experienced before were scarcity of water, lack of means of transportation and inadequate business capital. My wife and other women in the village used to wake up early in the morning and walk for the entire day searching for water. They had virtually no time to engage in production activities and

so harvests decreased for most of us; some became hungry as they harvested too little to feed their families. Furthermore, business men from town used to come and forced us to sell our harvest at lower prices as they knew we had no means to reach better markets.

In 2010, CARE introduced village savings and loan (VSL) scheme in our village through trainings and awareness creation meetings. At the same time, there was another team of iWASH that came to investigate the possibility for tap water system in our village.

I joined the first VSL group that we formed in the same year; I got loan that I invested in the shop business you see flourishing today. Since then many VSL groups have been formed, there are about 14 VSL groups in our village. VSL has improved our lives, many VSL members have managed to start various enterprises: shops, poultry, food vending, brick making and local brewing. Some bought motorcycle, which generate their incomes and serve as the only means of transport for people and crops to the roadside and up to Turiani town. With the motorbikes, most farmers are getting more profit as they are able to transport their crops to sell in better markets.

Construction of tap water system started in 2011; it began with village meetings and each household was asked to contribute priori ten thousands (10,000); thereafter the work started. Nowadays, we have tap water everywhere in our village; this has completely ended the problem of water scarcity in Pemba village. It is this water that is helping us to start and strengthen other sectors of our local economy; gardening, brick making and food vending all need water! Also we now have more time to engage in other economic activities because there is no wastage of time in searching for water anymore. I thank iWASH, life has improved in Pemba. I now have a bright future. My plans is to expand my business apart from shop I want to continue buying and stocking crops and then sell the crops during the boom price. I am confident to take my children to good school and if things go well I plan to build good house in Turiani town.

**65. Story title:** Income from masonry is revived and stabilized!

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is RamadhaniDunga, age 37 years. I live in Dukani sub-village in Pemba with my wife and two children; our first born is in standard three at Pemba primary school; the second one is still young to be taken to school.

I depend on farming and mason work for sustain my family. In the past we had think forests around our village; nowadays people have cleared large part of the forests for timber and charcoal. Consequently, rains have creased and our harvests are decreasing progressively; my income is decreasing because I have no surplus crops to sell. We are suffering because of what we did in our forests! Unless we take proactive actions to stop clearing the forests we will even

suffer the most in the future. Rivers and ponds where we used to get water dried too. People especially women had to walk the whole day searching for water; they had no time to do farming and other economic activities. Washing clothes and utensils, and all sorts of activities were done in rivers; water became dirty and health-wise unsuitable for human consumption. Many villagers suffered from cholera and stomach diseases; life was really tough. As a mason, my job was jeopardized as there was no water to make bricks for building houses.

I am thankful to iWASH that brought tap water system in the village because my load has been reduced especially on the work of mason. Nowadays, water taps are everywhere; water is plenty. People are using water to make bricks; as a mason I get more house building tenders these days and my income has become stable. Even though hot sun is still killing our crops in farms I can sustain my family from the income I get from house construction tenders. With this trend, I expect to build a nice house and take my children to good school for their future and the future of the family as a whole.

**66. Story title:** iWASH has brightened my future

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Thomas Paul Goko, aged 36 years. I am married to one wife and have two children. I and my family live here in Komikongowe sub-village in Pemba village.

Before the coming of iWASH, water scarcity was the greatest challenge in our community. Drought came and most rivers and ponds dried; we had to fetch water from few wells that remained far away at the foot of the mountains. My wife used to spend almost the whole day fetching water. I had to do all the farming activities alone; the farm and the harvest decreased. Besides, the water in the wells were very dirty; people used to bath and wash clothes in the same wells during the night; when you go in the morning you find very dirty water. Ooh! The situation was really terrible!

I real thank iWASH for the tap water which is now found very near my home. My wife has now settled, she helps me with farming because she is not spending much time in the search for water. We are cultivating large farms than before. Although rains are not good as before at least we can produce enough to feed the family and sell some surplus. I plan to take my children to better school and build a nice house.

**67. Story title:** Life is good in Pemba village

**Domain of Change:** *Economic Resilience*

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is MussaKihondo, aged 26 years old. I migrated to this Pemba village in 2012 and established my residence in Komikongowe sub village. I got married to SiwemaMpangwa and we have one child now. I and my family depend on farming for food and income. I also do casual labour in order to get additional income.

I hear that this village used to have water scarcity problem but I have never been part of those who suffered the water scarcity problem.

All I see since I came to this village is water taps everywhere with plenty and clean water, which I am told it was the liberation job done by iWASH. Life is really good in this village; I plan to start vegetable gardening because we have plenty of water, and work hard in other economic activities to improve my income and life in general.

**68. Title: Enjoyable life with abundant clean water**

**Domain of change:** Economic resilience

**Name of person recording the story:** Jackline G. Msuya

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** March 10<sup>th</sup> 2013

My name is JeremiasKanuti, 40 years old. I live in Mgalai sub-village in Pemba village with my wife and three children. I and my family depend on rain-fed farming for our living; we grow maize to feed the family and beans for sell to gain cash. In good years we used to sell some surplus maize to get more cash but things has changed now.

Since the last decade, life is becoming difficult year after year. Rains are not good as they used to be, drought has become more frequent; and as a consequence yields of our crops have decreased. Sometimes we harvest nothing due to prolonged drought; I planted two acres of maize last month but all maize has been burnt by the hot sun, all seeds have gone for a waste. Income are falling instead of rising, we can hardly produce for subsistence with no hope for other family development, leave alone contribution to development of our community. Dwindling crop yields was not the only challenge brought by drought, water become scarce too and affected the entire village. All villagers had to go a long distance in search of water from wells and ponds or stream of water from mountains. Life was even worse at the peak of the dry season as all nearby water sources dried. At times water got contaminated and that caused another disaster, outbreak of diseases like diarrhoea and cholera became common in our village. With the coming of iWASH program in our village, life has become enjoyable to everyone in this village even though my family and many others are still struggling to construct an improved latrine.

Through iWASH water taps are everywhere in our village, we are now getting clean water just nearby our homesteads. Life is now much, much better. Water is plenty in the taps throughout the year; we actually have more water than what we need for drinking. Now, we have started gardening using surplus water from the taps. We are growing tomatoes, carrots and other green vegetables in our garden. Since last year, my wife has been selling some vegetables from our garden to earn income to fulfil family obligations. As drought continues we are seeing

gardening as a cushion to our survival that would otherwise be devastated. Thanks to iWASH who helped us to get abundant clean water. I believe the water abundance is not going to change soon because we are taking care of the forests in which the water originates.

## Part 2: Stories from school children

**69. Story title:** I come to school energetic but inadequate teachers is an obstacle

**Domain of Change:** Improved primary school performance

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Abubakar Salum, aged 13 years. I am in standard seven here at Pemba primary school. I have seven siblings: Fujo, Salum, Issa, Said, Upe, Zakir and Asha; but I don't know their age. My father is SalumMngoya and my mother is Zamoyoni Madawa. I was born and live with my parents in Dukani sub-village; the place is covered by many shops (Singular Duka, in Kiswahili) that's why it is called "*Dukani*". My parents depend on farming to sustain the family; besides my father is a tailor and my mother is sells milk.

Before 2011, water supply was a great challenge to me and everybody in the village. Life was very touch! I and other children used to go to fetch water during the night; the next morning I would come to school very tired. It was hard to follow teachers' instructions because I would lay my head on a desk and sleep in classes. Nowadays, the challenge of water scarcity is over! iWASH has solved the problem for good. Water taps are everywhere, even here at the school compound. I do not have to fetch water at night from far as before. The only activities I do at home are washing my clothes and preparing myself for the next school day. Sometimes I help my mother with different domestic activities but they are not very hard ones. I do not come to school tired as before; no more sleeping in classes. Nevertheless, I do not see much progress in studies. We are still facing a serious problem at school, teachers are few in number and they just can't afford to assist the whole school. When I grow up I want to be a teacher in order to support my parents.

**70. Story title:** Low income limits the opportunity to go to secondary education

**Domain of Change:** Improved primary school performance

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Andreas Kalori, aged 13 years. I am in seven here at Pemba primary school. My father is KaloriMadaba and my mother is Mary Adesi. I was born and live with my parents at Dukani sub-village in Pemba village. My parents are farmers. While at home I prefer doing some reading, washing my clothes and taking showers. We are eight children in our family; my siblings are Sikitu, Gift, William, Erick, and Loveness. Sikitu is my elder sister; she worked hard and managed to pass standard seven examinations but she could not continue to secondary school because my parents didn't have money to pay for her. She is now at home taking care of her baby. I would like to be a teacher and good father.

**71. Story title:** Nice toilets and plenty water stopped diarrheal diseases among school children

**Domain of Change:** Improved health

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Gabriel Emily and I am 14 years old. I was born in Gonja village but now I live with my parents in Mgalai sub-village here in Pemba village. I am in standard six at Pemba primary school. My father's name is Emily Petiv and mother is RozaTiti. They are farmers. We are six children in the family; my siblings are Subira (19), Tumi (17), Ezekiel (11) and Jeofrey (9); and Stephen whom I don't know his age.

When I am at home I always do relax and study only, I also wish to become a teacher. The greatest change that I have seen is nice toilets at school; and water tap with plenty clean water at school and in the entire village. Our school used to have dilapidated toilets; and getting water was an issue not only at school but also at our homes. We used to drink dirty water; some of my friends used to suffer from typhoid fever and even dysentery. iWASH brought clean tap water and constructed very nice toilets you see in our school. Nowadays, we really enjoy life at school; we are using very nice toilets never seen anywhere in our community; also typhoid and dysentery have become things of history.

**72. Story title:** Nice toilets and plenty water stopped diarrhoeal diseases among school children

**Domain of Change:** Improved health

**Name of a person recording story:** Hope Kaiza

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is John Paul, 15 years old. I am standard seven here at Pemba primary school. I was born and live with my parents in Mgalai sub-village in Pemba village. My father is Paul Remi and mother is RithaSiwili. We are four children in the family; other children in the family are Theresia (18), Silili (12) and Scholastica (9). Theresia, my elder sister has finished her secondary education but she didn't pass the examination; she just stay at home now. Silili is in standard five while Scholastica is in standard two. My parents are all farmers; besides my father is the Village Executive Officer (VEO) for our village. I do not like farming because I hate using a hand hoe. I like studying because it makes me happy; I am among the top three in our class.

Nowadays, we have plenty clean water from the tap here at school. Teachers are now asking us to work in our school garden always; this is something bad to me; it is a challenge. Despite of that challenge, I will never forget iWASH. We used to have worse toilets that did not have water. We used grasses or papers to clean ourselves after visiting toilets; this made me and my friends to get dysentery several times. iWASH has brought us nicest toilet, and clean and plenty tap water; we no longer suffer any stomach disease. I wish to become a teacher when I grow up.

**73. Story title:** I fetch water from close our home, I can concentrate on my studies

**Domain of change:** Improved education

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 07/03/2013

My name is SikujuaBakari, aged 15 years old. I live in Kanga village with my parents, my mother with my mother Asia Ali and my father BakariHasan. We are five children in our family, my elder brother Hamis (20), young sister Amina (5) and the baby boy Ibrahim (2).

I am in standard six here at Kanga primary school. I was born in Dihinda village before my parents moved to Kanga village. When I was growing up water was scarce; I used to go to the bottom of the mountains to fetch water. I did not like fetching water because it was tedious; sometimes I used to avoid classes because I would be tired most of the time. Farming is another irritating work to do; we waste our energy because we harvest very little due to drought. Sometimes we do not have enough to eat; we eat once instead of the normal twice a day. Life has become difficulty due to drought.

Nowadays, we have plenty water in our village unlike our neighbours in Dihinda village. Several rope pumps wells were constructed in the entire village over the last two years; we are now getting clean and safe water. We do not have to walk long distance to fetch water us before. I have more time to concentrate with my studies. The activities I do at home are cooking, washing kitchen utensils and clean the home grounds. In the past I did all these jobs besides walking to the bottom of the mountains and coming back with bucketful water. Nevertheless, there are some people who are still dying of cholera as before; I think these people are dirty. I want to be a Teacher once I grow up.

**74. Story title:** Water is plenty nowadays I am a smart girl

**Domain of change:** Economic Resilience

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 07/03/2013

My name is Loveness Timothy, aged 12 years. I am in class seven here at Kanga primary school. I live with my parents here in Kanga village at Uchagani street; my father Timothy Peter and mother Happyphenia Rogasian Mramba. My father is a businessman, he sells mattresses; both my father and mother are farmers too.

Drought has increased these days; harvests and income have decreased in our family. We are getting two meals a day instead of three times a day. Also there is no money to buy nice clothes as before. In the past water scarcity was another challenge but this has been solved. I used to walk long distances to fetch water and come back with a bucket on my head, those were difficult times. I could not wash my clothes properly as water as like diamond those days!

We have been provided with rope pump wells all over the village; I do not have to toil again to fetch water, I get it close to our home. I have enough water to wash my clothes; I have become very smart girl. All my friends, mom and teachers tell me that and they admire my smartness. I am proud of myself, and that makes me feel happy to be at school than before. I enjoy life at school now than before. I want to be a pilot once I grow up.

**75. Story title:** Cholera and malaria are gone

**Domain of change:** Improved health

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 07/13/2013

My name is Jakaza Adam. I am 13 years old. I am in class seven at Kanga primary school. I live with my parents here in Kanga village at Malenga Street. My parents are farmers; we have big maize and sugarcane farms I have two sisters: Hadija (17) and Fatuma (18); and three brothers: Salum (19), Adam (27) and Mkombozi (16).

Over the last five years I have seen several changes at home and the community in general. These days, rains are not good; drought has increased abnormally and we get less and less yields in our farms especially maize. Nevertheless, life has improved at our home even though I don't know the exact cause; we had grass thatched house in the past, now our house is thatched with iron sheets. We used to keep chicken alone but now we are also keeping cattle and goats. Our health has improved too; malaria cases have reduced because many people use George Bush's mosquito nets. Also there is no more cholera: we get clean water from the rope pump wells constructed all over the village over the last two years; the latrine are better nowadays and iWASH people have trained us on how to wash our hands with a soap before meals and after toilet visits. Once I grow up I want to be a university teacher.

**76. Story title:** Diarrhoea disturbs me no more

**Domain of change:** Health

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 07/03/2013

My name is ShafinaOmari, aged 12 years. I am in seven at Kanga primary school. I live in Kanga village with my parents who are farmers. When I go back home after school I help my mother to cook, wash kitchen utensils and sometimes fetch water from the rope pump well.

Nowadays we do not have enough to eat at our home; we get only two meals a day instead of three as before. Water used to be a problem but this has been solved; we used to walk almost the whole day fetching water close to the mountains; rivers and ponds near the village had no water especially during dry season. Besides, the water was dirty, I used to suffer from diarrhoea and that disrupted my school attendance. Nowadays, we have rope pump wells all over the village; we get clean water free from diseases. I am no longer disturbed by diarrhoea diseases

as before. We used to have grass thatched house but now it is iron roofed. This community has also been privileged to have cereal bank (*bankimazao*), and we see some people using electricity either from solar panels or generators; things that were not there before. These are important changes that I have seen at home and in the general community; I am not sure how they all came about. Nevertheless, I can see people in the village have become more active than before due to these changes. I want to be a pilot when I grow up.

**77. Story title:** Water is plenty but we do not have enough to eat

**Domain of change:** Economic resilience

**Name of person recording:** Lina Andrew

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 06/03/2013

My name is Aisha Omar, aged 13 years. I am in class six at Kanga primary school. I live in Kanga village with my parents who are farmers. After school hours I wash all the kitchen utensils and fetch water for the family.

Hunger has become severe these days; we get two meals a day not three as before. Weather has changed dramatically; rains are not enough and harvests have decreased. Water scarcity used to be the major challenge; rivers and ponds in and close to the village dried. We had to fetch water from the foot of the mountains far away; it was tedious. Some people came in our village and brought us rope pump wells all over the village. I want to be a primary school teacher when I grow up.

**78. Title:** I enjoy plenty water and nice latrine and our family status has gone high due VSL

**Domain of change:** Health/Economic resilience

**Name of person recording the story:** Mweta Harold

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 11. 03. 2013

My name is MatesoBakari aged 14 years. I live with my parents in Pemba village, and I am in class six here at Pemba primary school. I like living in Pemba because we have enough land for farming. Nevertheless, I do not like farming because of the use of hand hoes instead of tractors as I was taught and seen in Madizini and Kibati. Also, farming is no longer attractive. We have experienced prolonged drought over the past five years or so; harvests decreased and life became hard as we did not have enough to eat. Many rivers and ponds dried too; water became scarce, me and my mother used to walk long distances to fetch water after waiting in long queues for couple of hours; sometimes there were quarrels at the water source. The water we got was dirty because many people did not use latrine; I used to suffer from diarrhoea.

Over the past three years, iWASH project came in our village. They introduced good latrines, village savings and loan and helped to construct water taps close to our homes using pipes aligned from the Mountains; water from these taps are clean and tasty. We got nice latrines

you see here at our schools furnished with water system; other water taps are around the class rooms. My farther constructed a nice latrine at home; he also joined savings and credit group. Life at both school and home is much better than before. I and my mother are relieved from carrying buckets of water from far away; latrines at school are always clean because we have plenty water for cleaning. I do not get diarrhoea as before because I drink clean water; I also wash my hands after visiting toilet and before meals. We have started to use the plenty water for gardening here at school even though I don't like it; it is a lot of work to take care of the garden. I remember my father took a loan from savings and loan group that he invested in farming; he grew beans and bought a motorbike after selling the beans; the status of our family is now high; I am proud of it! I would like to perform better and continue with secondary school; later I want to be a teacher.

**79. Title:** Improved water supply instigates gardening at Pemba primary school

**Domain of change:** Economic resilience

**Name of person recording the story:** Mweta Harold

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 11. 03. 2013

My name is MwajabuHaji, aged 15 years. I am in class six at Pemba primary school. I live with my parents and other four siblings here in Pemba village. Our family depends on farming; besides my father is a traditional healer. I don't like living in Pemba because I do not want to be a farmer. In the past, life was attractive here; we had enough to eat. Life started to be difficulty when rains decreased; my parents harvest less and less that cannot sustain us over the year. My father is lucky; he gets additional money from his traditional healing business, he uses the money to buy food for us. Water became scarce too, most water sources dried; I used to help my mother to go and fetch water from miles; it was a cumbersome job! The water was dirty and I used to get diarrhoea.

Over the last three years, things have changed in our village. iWASH came and brought tap water at school and our home, the same for good latrines. My father has constructed a new good latrine equipped with a hand washing facility. Tap water with plenty water all the time are everywhere in the village; we are served from the hard job of fetching water from across valleys and mountains, life is more attractive. My mother join my father in farming, they are cultivating more land than before. After the tap water, we have started gardening at school; we grow Chinese cabbage, ordinary cabbage and bananas. These are important changes that I have seen in our village.

**80. Title:** Pemba has turned to be a nice place to live

**Domain of change:** Life in general

**Name of person recording the story:** Mweta Harold

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 11. 03. 2013

My name is Jannet Pascal, I am 13 years old. I am class six at Pemba primary school. I live with my parents in Pemba village who are farmers and keep pigs. After school I help my parents washing clothes, cleaning our compound and cooking. I also do home works and private reading at home.

I used to hate living here at Pemba village because life was not good; bad roads, poor harvests and hunger due to drought. Worse enough we used dirt water that caused diarrhoea; yet we had even to walk for hours to get the water from the foot of the mountains. I really hated to live in this village leave alone being a farmer. I used to think of my away out of this village. I knew if I get my own job it would be easy to get out of here; I would use my salary to build a nice house for my father and mother as the present house is not good at all; I would also support my young brothers and sisters to go for further studies. This made me to concentrate on my studies as the only hope to do away with the dreaded life in this village. Nowadays, I am starting to see some good things coming to us; perhaps Pemba has turned to be a nice place to stay.

Over the last three years, I have seen good things happening here that I have slowly changed my mind; this place could be a better place to stay. We had no latrine but now have nice latrine at home and my father has acquired additional farm. We were using dirty water that we had to fetch from far away in valleys at the foot of the mountains; now water taps with clean water are ubiquitous in our village; we even have water taps at our school compound and in school latrines. We did not know how to keep ourselves and the environment clean, now we have been taught how to observe cleanness and wash our hands after toilet visit and before meals. We did not have nice latrine at school, now we have two blocks of latrine: one for girls and one for boys. All these good things have been possible through iWASH, we very grateful to them. We are making use of the plenty water supply; we have started school garden planted with banana and cabbages.

Life is good now in our village, I want to be a doctor and stay in our village when I grow up.

**81. Title:** The village is provided with clean water but the school well have no water at all

**Domain of change:** Economic resilience

**Name of person recording the story:** Mweta Harold

**Region:** Morogoro

**District:** Mvomero

**Date of narration:** 10. 03. 2013

My name is Rehema Ally, aged 13 years. I am in class six at Kanga primary school. I am the last born in the family of Ally Juma and our mother Aziza Rajabu. I live with my mother and other four brothers; my father died five years ago. My mother is a farmer and we help her with farming activities; we grow maize and rice.

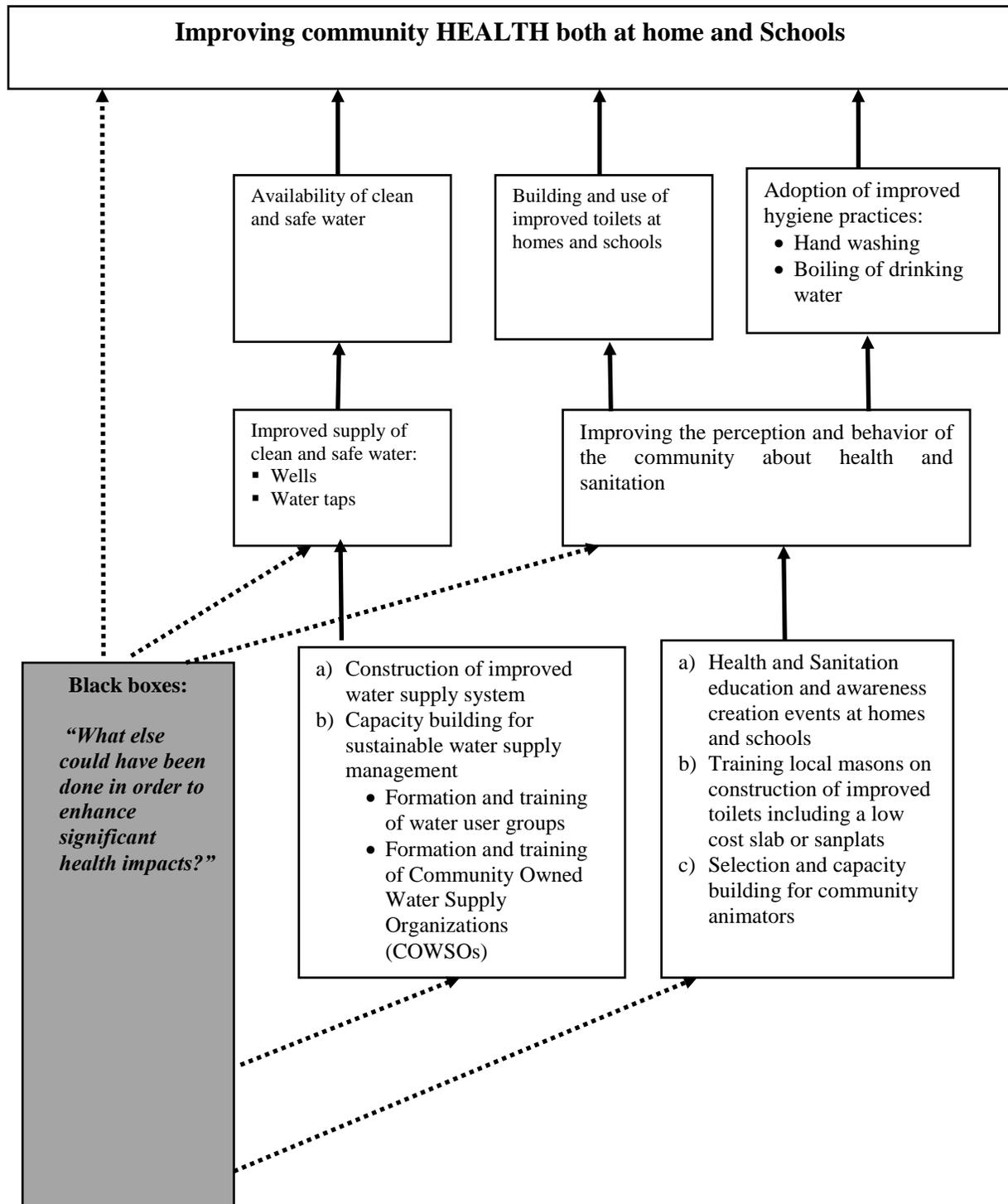
I do not like life here in Kanga because we do not get enough harvests due to drought. We do not have enough to eat most of the time. Sometimes my mother prevent me from going to

school during farming season; she ask me to help her with farming; yet our energy is wasted as the hot sun stunts our crops. I do admire my friends who have both parents because life has become hard after the death of our father. I am struggling to study hard; perhaps this will give me the way out; if I pass primary education exams I will continue with secondary education. I do not want to study at Kanga secondary school because teachers are inadequate there; students in that school fail their national examination every year.

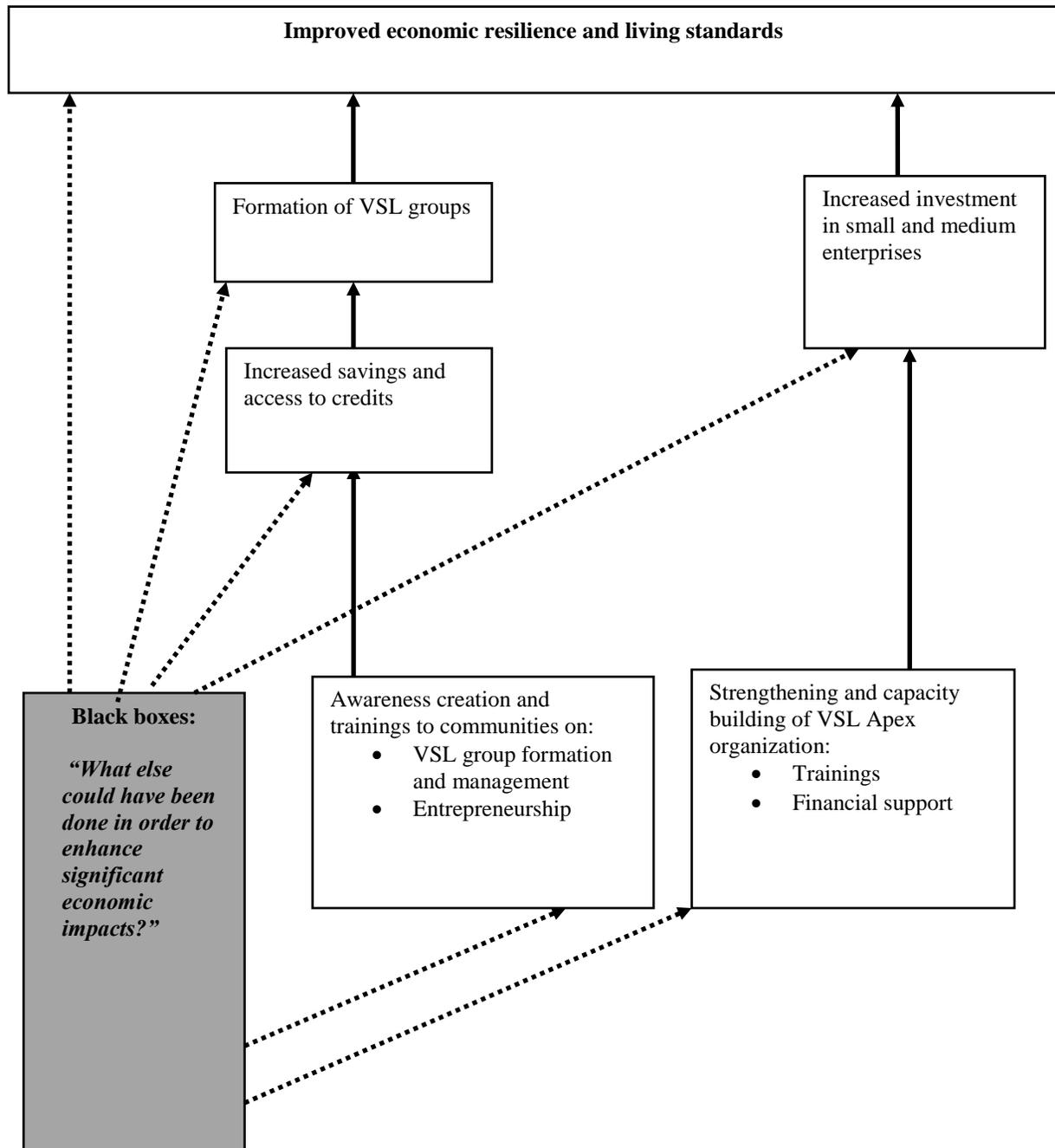
There have been some good things happening in our village for the last three years. In the past had no water in the village; we used to walk far away to fetch water but now this burden is over. iWASH project helped to construct rope pump wells all over the village, the wells are close to our homes; we enjoy life to some extent. Time for girls and women to fetch water has been reduced; we have more time to do other economic activities and cleanliness activities at home. Nevertheless, life at school is still challenging; the well drilled at our school does not have water. We still suffer from water shortage while at school. But there some good things that happened at our school too; Room to Read project built two classrooms and one library, they also brought 90 desks for our school. We enjoy these facilities at school, we are very happy.

I would like to go up to secondary school and become a primary school teacher.

**Appendix 4:** Scheme for guiding theory-based evaluation of health impacts of the iWASH program



**Appendix 5:** Scheme for guiding theory-based evaluation of the economic impacts of the iWASH program





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