

Assessment of Sustainability of Rural Water, Sanitation and Hygiene Interventions in Rwanda

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Abstract/Summary

This paper describes the methodology used for, and findings of, the assessment of sustainability of rural water, sanitation and hygiene (WASH) interventions under Rwanda WASH Project implemented by the Government of Rwanda with support from the Government of the Netherlands and UNICEF during 2009-14. The methodology involved development of the assessment tools, household surveys, focus group discussions, interviews with key informants and audit of WASH infrastructure. The sustainability of the project was assessed against 22 indicators grouped under five categories i.e. institutional, social, financial, technical and sanitation and hygiene. The overall sustainability score for the project (four districts) averaged 86% in 2014, showing a significant increase when compared with the corresponding scores of 70% in 2011 and 75% in 2013. The experiences of Rwanda WASH project demonstrate that regular sustainability assessments, though requiring significant financial resources and efforts, contribute to a considerable improvement in the sustainability of WASH interventions.

Introduction

The Government of Rwanda, with support from the Government of the Netherlands and UNICEF, implemented the Rwanda Water, Sanitation and Hygiene (WASH) Project during 2009-2014. The project sought to contribute to improved child survival through increased access to sustainable safe water and sanitation and improved hygiene practices in four priority districts namely Rubavu, Nyabihu, Musanze, and Burera located in the north-western part of Rwanda.

The key achievements of the project till December 2013¹ include provision of access to safe water supply to 500,000 beneficiaries through construction of 35 piped water supply systems (involving more than 600 kilo meters of pipeline) and drilling of 29 boreholes; provision of piped water supply to 108 schools and 23 health centres; provision of rain water harvesting facilities in 258 schools and 50 health centres; provision of sanitation facilities to 160 schools and 29 health centres; promotion of safe hygiene practices and household sanitation benefitting 450,000 people; and capacity building for sustainable operation and maintenance of the supported WASH systems.

The Rwanda WASH project, which had a total budget of approx. US\$ 24 million, was coordinated by Rwanda Water and Sanitation Corporation (WASAC), under the leadership of the Ministry of Infrastructure, Government of Rwanda. A key component of the project design was to ensure sustainability of the supported interventions after the external support had stopped. Consequently, an annual sustainability assessment was built into the project at the design stage. So far, three assessments have been conducted since the project inception i.e. during 2011, 2013 and 2014 to assess the sustainability of the completed interventions. Important insights generated from these assessments were used to further enhance the project sustainability.

¹ The project formally concluded in December 2015 but almost all the planned project interventions were completed by end of 2013.

This paper describes the methodology used for assessment of the sustainability of the Rwanda WASH project as well as its key findings. The experiences of the sustainability assessment exercise in Rwanda could be used for assessment of sustainability of rural WASH interventions elsewhere, especially where the rural water supply systems are being managed by the private water operators.

Description of the Methodology

The sustainability of rural WASH interventions remains a major challenge in the developing countries. In Rwanda, where the coverage of improved water supply and sanitation is 85% and 83% (GoR, 2016), respectively and open defecation is estimated at 2% (UNICEF and WHO, 2015), sustainability is emerging as a key sector challenge with over 30% of the rural water supply systems being non-functional (WASAC, 2016). Increased emphasis is, therefore, being placed on assessing the sustainability of WASH interventions, particularly for donor-fund projects. Consequently, a number of tools have been developed for this purpose (Boulouar, Schweitzer and Lockwood, 2013; Ockelford and Cohen, 2013; Adank and Kumasi, 201; Godfrey et al., 2014).

The methodology used for assessment of the sustainability of interventions implemented under Rwanda WASH project was based on the experiences of previous sustainability assessments carried out for Rwanda WASH project (GoR and UNICEF, 2011 and 2013) as well as other countries (Godfrey et al., 2014) with adjustments made to suit the local context i.e. with focus on private operators, who were engaged to operate and maintain the water supply systems constructed or rehabilitated under the project by the Districts.

The assessment was carried out with the following objectives (i) to assess the sustainability of the water and sanitation facilities constructed, and sanitation and hygiene promotion related intervention implemented, under the project in four target districts and (iii) to recommend necessary actions to improve sustainability outcomes.

The methodology for the assessment, which was led by the Ministry of Infrastructure, Government of Rwanda, and conducted during November-December 2014 by an independent audit company engaged through competitive bidding process as per terms of reference agreed with the Government, included review of relevant project documents, development of tools (scoring matrix, survey questionnaires, focus group discussion and in-depth-Interview guides), primary data collection using qualitative and quantitative methods, and data analysis. The data collection exercise used for the assessment is briefly described as follows:

- (i) Household survey: Household interviews (1000 households, average 250 per district selected randomly) were conducted to get the views of the community members on behavior change communication interventions; hygiene practices; sources of water and the cost of water. At each household, a face to face interview was conducted as well as a structured observation of aspects such as the general hygiene conditions of the home e.g. cleanliness, waste disposal, availability of a latrine, condition of the latrine; construction quality, status i.e. full or still in use, structure of the walls, roofing and doors, latrine cover, availability of hand washing facility and water and soap near the latrine, cleanliness of the latrine and presence of faeces around the latrine and around the home. In addition to the above, the enumerators looked out for incidences of open defecation around the community as they visited the selected households;
- (ii) Interviews with key informants: A total of 89 key informant interviews were conducted. The key informants were selected based on their roles in relation to water and sanitation and included government ministries, NGOs, private water operators, school head teachers and health center officials;
- (iii) Focus group discussions: A total of 35 focus group discussions were conducted with community members and water point committees; and
- (iv) Facility audit: A facility audit was carried out using an observation check list for the facilities supported under the project in the four districts. In this regard, all the 35 water supply systems constructed under the project in the target districts were assessed (94% of which were constructed before end of 2013). As regards boreholes, 14 out of 29 boreholes, almost half of the total boreholes constructed were surveyed. Similarly, infrastructure supported in 17 health

centers and 52 schools was assessed.

The enumerators recruited for the assessment had strong experience in conducting similar studies with a considerable number having been on the team for the previous sustainability assessments. A three-day training was, however, conducted for enumerators, which involved one day of field work (i.e. pilot testing and reviewing of the tools).

The household survey questionnaire was scripted onto a mobile device with inbuilt skip routines to minimize errors. Completed questionnaires were directly uploaded onto the server, downloaded and reviewed by the data team before the data was exported to SPSS Statistical Software.

All the data collected was analyzed using SPSS statistical software while findings from the focus group discussions and facility audits were summarized into grids.

The indicators used and the corresponding weightage used for assessment of the sustainability are presented in Table 1.

Table - 1: Matrix used for calculation of sustainability scores

Categories and Indicators	Maximum Score
1. Institutional Aspects*	
1.1 Enabling environment- WASH systems, institutions, policies and procedures at the national, district and community level are functional and meet the demand of users	5
1.2 Clarity of roles and responsibilities - WASH service users, authorities and service providers at the local, district and the national level are clear on their roles and responsibilities and are capable of fulfilling these roles effectively	5
1.3 Existence of updated database for water supply systems	5
Total	15
2. Social Aspects	
2.1 Community knows where to go in case of breakdown of water supply system	4
2.2 Representation of women in water point committees	4
2.3 Social marketing - training and information on WASH and behavior change received at household level	4
2.4 Social inclusion - all community members (including women, widows, poor and people with disabilities) are involved in WASH activities	4
2.5 Community perceptions towards the water supply systems (accessibility, acceptability, affordability, quantity and quality)	4
Total	20
3. Financial Aspects – water supply	
3.1 System to collect and manage funds is functional	5
3.2 Quality of financial records	5
3.3 Income is equal to or higher than the expenses	5
3.4 Financial capacity of the District for major repairs	5
Total	20
4. Technical Aspects – water supply	
4.1 Construction quality	5
4.2 Functionality	5
4.3 Maintenance	5

4.4 Availability and accessibility of spare parts	5
4.5 Frequency of break downs	5
4.6 Capacity of the Private Water Operators for routine repairs	5
4.7 Time spent to repair	5
Total	35
5. Sanitation and Hygiene	
5.1 Functionality (quality and maintenance of latrine)	4
5.2 Status of Open Defecation	2
5.3 Hygiene	4
Total	10
Overall Total Score	100

The scores per district from the above analysis were then categorized as follows:

- Below 50% = Low sustainability level
- Between 51% - 75% = Average sustainability level
- Between 76% - 90% = Satisfactory sustainability level
- Above 90% = Good sustainability level

Main results and lessons learnt

1. Key Results

The overall sustainability score for the project (four districts) averaged 70% in 2011 and 75% in 2013 (GoR and UNICEF, 2015). This increased to 86% in 2014. As can be seen from Figure 1, there is also a considerable improvement in district scores over the years. Whereas in the previous assessments, Musanze and Nyabihu districts were the only districts found to be at satisfactory sustainability levels, now all four districts are almost at par regarding sustainability levels due mainly to hand-over of the management of water supply system to the private operators.

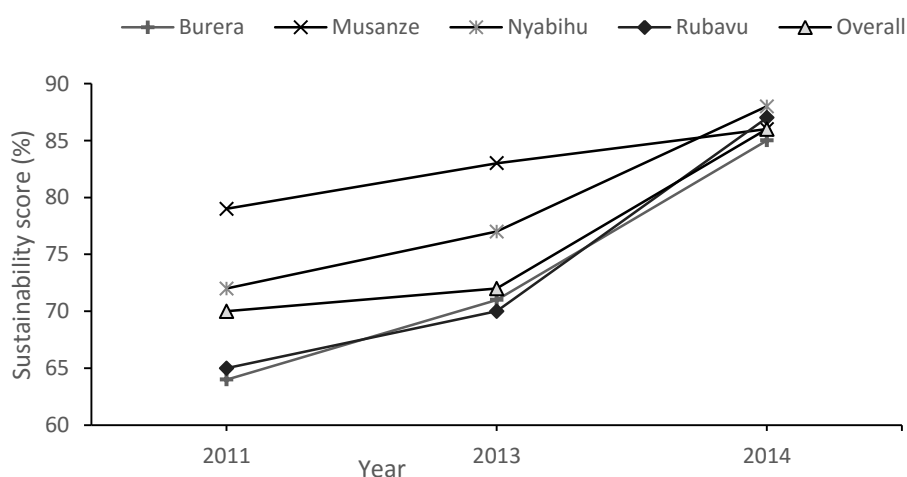


Figure 1: Project sustainability trends during 2011 to 2014

The scores achieved by the project in 2014 for various categories of sustainability aspects (Table 1) are briefly discussed as follows:

1. The institutional sustainability of the project averaged 87%. The contributing factors to satisfactory

score for institutional sustainability included sector reforms implemented by the Government of Rwanda which resulted in creation of rural water supply services division in WASAC in 2014, improved management after hand-over of the water supply systems to the private operators, increased focus on decentralized service delivery by the Government of Rwanda and existence of database for water supply systems. An area of concern noted with regard to the institutional sustainability was lack of effective system for monitoring the performance of the private water operators.

2. The social sustainability averaged 82%. The satisfactory sustainability score was attributed to high awareness of community regarding where to report breakage/non-functionality, high degree of community awareness of the diseases that can be prevented by washing hands with soap, positive perceptions of community members towards inclusion of women, widows, the elderly and the poor in the project activities and improved community perception with regard to public standpipes (quantity, quality and accessibility). The related indicators/sub-indicators which scored low included percentage of people who confirmed receiving messages or information about sanitation and hygiene (despite the intensive community awareness campaigns), use of soap for handwashing, affordability/cost of water, perception of the community towards boreholes and involvement of people with disabilities in the project activities.
3. The overall financial sustainability for the project was rated at 90% i.e. 10% higher than 2013 score and one percentage point shy of good sustainability. While all the districts recorded increase in financial sustainability, Rubavu recorded the highest increase from 80% in 2013 to 100% in 2014. The main factor leading to this increase was the management capability of the private water operators (PWOs) for each district, especially for Rubavu where most of the water supply systems are being managed by country’s largest and most experienced PWO. Other contributing factors included effective system for collection and management of funds (i.e. water vendors who sell water), high cost recovery and financial capacity of districts to undertake major repairs. Some districts, however, recorded low scores with regard the quality of financial records available with the PWOs.
4. The overall technical sustainability for the water supply systems averaged 91%, the only indicator which was categorized as having “good sustainability level”. The high technical sustainability score for the project was attributed to good construction quality, high functionality of the systems, easy availability of spares, ability of private operators to undertake timely repairs and low frequency of breakdowns. Several issues related to technical sustainability, however, were identified. These included maintenance, and decline in usage, of boreholes compared to piped water supply systems as well as poor maintenance of rain water harvesting infrastructure in schools.
5. The overall sustainability score for sanitation and hygiene averaged 69%. Though it increased considerably from an average of 55% in 2013, it remained the lowest of all the sustainability aspects assessed despite the high latrine coverage (93%) in the target districts. The low score for sanitation and hygiene was attributed mainly to the challenges pertaining to the quality and cleanliness situation of latrines, availability of handwashing facilities in the vicinity of latrines and hygiene around water points. For sanitation in schools, the key issues identified included lack of availability of sufficient funds for operation and maintenance and lack of ramps with appropriate slopes for people with disabilities in several schools located in mountainous areas characterized by steep slopes.
6. As part of the sustainability assessment, water quality of sampled water supply systems was assessed, though it was not included in the scoring exercise. The key issues identified in this regard included bacterial contamination and low pH for a few water sources.
7. The key recommendations of the sustainability assessment included the following:
 - (i) Conduct behavioral change communication campaigns in the target districts with strong focus on hygiene and sanitation promotion.
 - (ii) Work with the private water operators and water point committees to devise and implement a mechanism for proper maintenance of the boreholes;
 - (iii) Allocate appropriate funds to address the issues related to maintenance of rain water harvesting system in schools as well as accessibility of sanitation facilities (i.e. construction of ramps with appropriate slopes);
 - (iv) Take appropriate actions for pH adjustment and chlorination of the concerned water supply

- systems; and
- (v) Devise an adequate reporting and monitoring system for the private water operators and arrange refresher trainings for them.

2. Follow-up actions

Following the completion of the sustainability assessment, the key findings were shared with the concerned districts and the assessment report was finalized in light of their comments and feedback, where relevant and agreed and accepted by the independent audit firm. Subsequently, the Ministry of Infrastructure, Government of Rwanda, Water and Sanitation Corporation (WASAC) and UNICEF worked with the districts to prepare a management response which listed the key actions to be implemented in order to address the issues affecting sustainability as identified during the assessment. The agreed actions as per the management response are being followed through regular meetings with the district teams as well as field visits. Moreover, the findings of this assessment were used for evidence based advocacy which resulted in bringing the sustainability high on the sector agenda nationally and subsequent establishment of a task force on sustainability of rural water supplies under the Water and Sanitation Sector Working Group. Currently, the Government of Rwanda, with support from UNICEF and Japan International Cooperation Agency (JICA) and in collaboration with the districts and partners, is working on development of a national action plan for enhancing the sustainability of rural water supply systems. The Government of Rwanda’s new water and sanitation sector policy, which is currently being finalized, also includes strong provisions with regard to sustainability as well as for addressing the issues identified during the sustainability assessment of WASH project.

It may be noted that the methodology for sustainability assessment described here has not yet been integrated into the current national monitoring framework due to the limitations of the existing sector management information system (MIS). The Government of Rwanda, with support from development partners, plans to develop and operationalize a new monitoring framework and MIS for WASH sector during 2017. The methodology used for the sustainability assessment and the related information gathered will inform the development of the new monitoring framework as well as the MIS.

3. Lessons learned

The following key lessons were learned from the assessment of the sustainability of Rwanda WASH project:

1. For projects like Rwanda WASH project, the assessment of sustainability could cost up to US\$ 85,000 and take around four months to complete, including field work and drafting and finalization of the report. Given the fact that it is a time and resource intensive exercise, the assessment of sustainability needs to be planned carefully. Due consideration should be given to the timing i.e. rainy season, school holidays, community events, harvesting season and other factors that are critical for collection of adequate data or may contribute to delays.
2. The indicators/sub-indicators and the corresponding weightage used for assessment of the sustainability (Table 1) should be adjusted with due consideration to the changes in the context and approaches as the project interventions progress during the implementation period.
3. It is extremely important to select the right independent auditing firm having relevant experience and expertise, based on competitive bidding process and reference checks. For the projects of longer duration, the possibility of signing a long-term agreement with one firm should be considered to effect cost and time savings and to have quality output.
4. Considering the turn-over of the project staff, especially for the projects of longer durations, it is important to design a training module on assessment of sustainability for the staff.
5. For a sustainability assessment to be really meaningful, it is critical to put in place a follow-up mechanism to ensure proper implementation of the follow-up actions.

Conclusions and Recommendations

The sustainability of Rwanda WASH project was assessed using a tool adapted from the experiences of other countries with changes made to suit the local context. The assessment showed that the overall project sustainability was at satisfactory level (86%) in 2014. A comparison of the findings of this and the previous project sustainability assessments showed a considerable improvement in the sustainability

scores over the years following. Following completion of the assessment, the Government of Rwanda and WASAC, in collaboration with the respective districts and UNICEF, are taking appropriate measures to address the issues that may negatively impact the sustainability of project interventions.

As part of the sustainability assessment, no comparison was made between the project districts and non-project districts keeping in view time and resource constraints. Related assessments carried out by other partners, which did not capture the range of indicators assessed as part of the sustainability assessment, showed functionality of water supply systems was substantially higher in the project districts (where regular sustainability checks are conducted and follow-up actions taken) than the non-project districts. A study conducted in four districts of the Eastern Province of Rwanda, for instance, found that 87% of piped water supply systems were functional (JICA and WASAC, 2016). Compared to this, the functionality rate for the piped water supply systems for the project districts was 100%.

The experiences of Rwanda WASH project demonstrate that regular sustainability assessments contribute to considerable improvement in the sustainability of WASH interventions, through timely identification of sustainability bottlenecks and necessary follow-up actions for addressing the same. Moreover, the findings of the sustainability assessments could also be successfully used as an advocacy tool, as was the case in Rwanda, for prioritization of sustainability at the national level as well as by sector partners.

Given the resources and efforts required for carrying out the sustainability assessment, it is recommended to conduct these assessments once every two years rather than on annual basis. An alternative could be to design and carry out a simplified version of the sustainability assessment in between the comprehensive sustainability assessments. It is also recommended that the possibility of development of a simpler and cheaper sustainability assessment tool, which could be applied to large- and small-scale donor- as well as government-funded projects, should also be explored.

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