
Country case study report – Rwanda

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## Acronyms

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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>CFSVA</td>
<td>Comprehensive Food Security and Vulnerability Analysis survey</td>
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<td>DGIS</td>
<td>Directorate General for International Cooperation of the Netherlands</td>
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<tr>
<td>DHS</td>
<td>Demographic and health survey</td>
</tr>
<tr>
<td>EICV</td>
<td>Enquête Intégrale sur les Conditions de Vie des Ménages (integrated household living conditions survey)</td>
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<tr>
<td>HACT</td>
<td>Harmonized approach to cash transfers</td>
</tr>
<tr>
<td>JMP</td>
<td>WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>NISR</td>
<td>National Institute of Statistics of Rwanda</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
</tr>
<tr>
<td>PHAST</td>
<td>Participatory Hygiene and Sanitation Transformation approach</td>
</tr>
<tr>
<td>PPP</td>
<td>Public-private partnership</td>
</tr>
<tr>
<td>RURA</td>
<td>Rwanda Utilities Regulatory Authority</td>
</tr>
<tr>
<td>RWS</td>
<td>Rural (and small town) drinking water supply</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
</tr>
<tr>
<td>SNV</td>
<td>Netherlands Development Organisation</td>
</tr>
<tr>
<td>WASAC</td>
<td>Water and Sanitation Corporation</td>
</tr>
<tr>
<td>WASH</td>
<td>Water, sanitation and hygiene</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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A. Executive summary

A.1. Background and objectives

This country case study report is a component of the ‘Global Evaluation of UNICEF’s Drinking Water Supply Programming in Rural Areas and Small Towns’, which was commissioned by the UNICEF Evaluation Office to assess UNICEF’s experience and contributions in this area between 2006 and 2016. The global evaluation is informed by seven other country case studies, which all follow the same structure and methodology, and by additional sources of evidence, including a review of UNICEF and non-UNICEF documents and databases, a global online survey and semi-structured interviews with diverse sector stakeholders.

The country case study is not a full evaluation because it is less comprehensive in terms of scope, data collection and analysis. Its main objective is to feed into the global evaluation report by gathering information about UNICEF’s programming in rural and small town drinking water supply (RWS) and the evolution of UNICEF’s contribution to the sector at the country level. The case study also presents findings and recommendations that are intended to be useful to UNICEF Rwanda and its partners in-country.

A.2. Brief presentation of the sector context and of the evolution of UNICEF RWS programming

In rural areas of Rwanda, the proportion of the population not using an improved water source for drinking fell by 15 percentage points between 1990 (43%) and 2015 (28%). In 2015, 72% of the rural population had access to an improved water source, which is 16% higher than the average for sub-Saharan African countries. According to the 2015 WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) report, 76% of the Rwandan population (rural and urban) had access to an improved water source in 2015, compared with 58% in 1990. The rural/urban disparity is thus relatively limited. Sub-national geographical disparities are also relatively modest.

A number of factors have combined to create an enabling environment within the country and the sector over the evaluation period. These include the country’s small size, high population density, political stability and significant economic and social development over the past 15 years. The institutional context is also an enabling factor: the Government of Rwanda is recognized as having strong leadership, the institutional setup is well-defined and the policy and legal framework makes the water and sanitation sector a clear national priority under the Vision 2020 national development strategy and objectives. Rwanda has benefited from a number of government initiatives aimed at improving governance, such as performance contracts between the national Government and the districts, annual benchmarking of district development performance and the expansion of public-private partnerships (PPPs) for piped network water systems. These features facilitate cooperation and make it possible to boost rural water supply coverage and scale up successful pilots.

Despite these positive evolutions, Rwanda’s rural water sector is still currently facing a number of challenges, including those arising from the pressures of rapidly changing demographic patterns, the demands of intensified socio-economic development, erosion due to farming and other land use practices, and the uncertainties created by climate change.
Over the first few years of the evaluation period (2006–2009), UNICEF focused primarily on emergency water access. It was only later (2009–2015) that a more comprehensive and development-oriented water, sanitation and hygiene (WASH) programme was implemented, funded jointly by the Government of the Netherlands, the Government of Rwanda and UNICEF. This initiative focused on four districts in north-west Rwanda and was one of the largest RWS initiatives in the country. It enabled the expansion of the Government of Rwanda-UNICEF WASH programme in terms of both funding and staffing and facilitated the development of piped network water systems, the promotion of PPPs and capacity building of districts and other programme stakeholders at all levels.

### A.3. Main evaluation findings

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td><strong>Relevance</strong></td>
<td></td>
</tr>
<tr>
<td>• Appropriate transition from a focus on emergencies to a more development-oriented focus</td>
<td>• Unclear relevance of boreholes</td>
</tr>
<tr>
<td>• Alignment with sector needs and policies (decentralization, move towards higher service levels, PPPs, water tariffs) thanks to highly participatory programme design and implementation</td>
<td></td>
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<tr>
<td>• Continued involvement in sector coordination and policy advocacy and development</td>
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<tr>
<td>• UNICEF’s credibility acknowledged among the sector</td>
<td></td>
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<tr>
<td>• Considered a trustworthy long-term partner in supporting government and bringing in a large amount of sector funding and competent staff</td>
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<tr>
<td>• Added value increased with the Directorate General for International Cooperation of the Netherlands (DGIS) programme, especially due to the combination of and linkage between downstream and upstream work</td>
<td></td>
</tr>
<tr>
<td>• Alignment, credibility and added value allowed a certain level of influence on the sector/government</td>
<td></td>
</tr>
<tr>
<td><strong>Effectiveness</strong></td>
<td></td>
</tr>
<tr>
<td>• Appropriate implementation arrangements, including good cooperation and communication</td>
<td>• Little evidence and knowledge products and no evaluations produced or supported by UNICEF, apart from the sustainability checks</td>
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<tr>
<td>• Generally good construction quality, especially for piped systems</td>
<td>• Weaknesses in programme monitoring and evaluation and limited support to the regulation agency</td>
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<td>• 30,000 beneficiaries of UNICEF supported capacity-building activities</td>
<td>• Uneven quality of training materials/methods and lack of refresher/continuous training</td>
</tr>
<tr>
<td>• Through its upstream work, contribution to the Government of Rwanda’s prioritization of the WASH and RWS sector</td>
<td>• Sub-optimal intensity of and synergies with the software component/Community Based Environmental Health Promotion Programme</td>
</tr>
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### Efficiency

- Timely completion of programme activities despite ambitious objectives; corrective measures have been taken when necessary
- Dedicated and skilled staff; demonstrated drive for results
- Use of strategic partnership with the Netherlands Development Organisation (SNV) to leverage complementary expertise and funds
- Leveraging of financial and human resources from the Government, the Water and Sanitation Corporation (WASAC) and districts
- Harmonized approach to cash transfers (HACT) implementation to streamline partnership management and minimize risks
- Commitment to increased programme integration as a way of maximizing results while reducing operational costs

### Sustainability

- Considerable effort to ensure that building blocks are in place for service delivery (for its supported piped water schemes), through: institutional arrangements and capacity building at the district level; design of viable PPP contracts; professionalization of water operators; sustainability monitoring; and financial provisions for operation and maintenance and direct support to services
- The switch to PPP professionalized water schemes management, resulting in reduced breakdown and downtime, and increased fee collection rate
- Empowerment of districts
- Provisions for cost recovery: clear accountabilities defined; tariff revision; bundling of ‘area-based’ contracts of private operators to allow for cross-subsidies; and royalties paid by operators to districts
- Efforts to clarify and strengthen the role of water user committees
- Setup and training of water boards as communication and accountability platforms and provision of space for consumers to raise their voices

### Lack of water treatment and monitoring and need for strengthening the chlorine supply chain and operators' capacities/practices in this area

- Some issues with the quality of hand pumps and drainage, lack of pipe protection/erosion control and lack of catchment protection at some sources
- Low-cost technologies/approaches such as spring development and protection discontinued
- Slow and sub-optimal application of principle/commitment to integrated programming with other interventions (e.g. in schools and health centres but also with health, nutrition and education programming, etc.)
- Weak cost-effectiveness of boreholes

- Weaker use, operation and maintenance and sustainability of boreholes
- Lack of water treatment and regular quality monitoring
- While there are now efforts being made to connect the pumping stations to mains electricity, consideration could have been given earlier to using lower operation and maintenance cost solutions
- Delegation of dysfunctional water schemes to operators unable to repair them; increase in household water consumption is too slow to significantly support the financial viability of the service
- Sustainability of training outcomes constrained by turnover of trained staff and the fact that too few people in each organization were trained
- Limited statistical representativeness of sustainability checks and the absence of a comparative dimension (e.g. with non-intervention sites or other donors/non-governmental organizations (NGOs)
Main recommendations

The Rwanda rural water supply sector and its enabling environment have evolved very quickly over the past 10 to 20 years. With more than 70% of the rural population now using improved water sources and the new Agenda for Sustainable Development for 2030, the objective of boosting the coverage rate will progressively be replaced by new objectives such as improving the level of service in terms of quantity, quality and distance to home; improving the financial sustainability of the sector; and ensuring that those who are currently excluded are included through targeted interventions focused on the needs of the most vulnerable populations.
viability of the service; reaching the remaining communities; and supporting households still using unimproved water sources who are often the poorest, most remote and most vulnerable. The solutions to addressing these challenges are now largely locally available. Technology options, political will and skills are available in Rwanda to a greater extent than in many other sub-Saharan African countries. External financial and technical support will remain necessary, however, and UNICEF will continue to have an important role to play in the sector.

UNICEF Rwanda is currently in the process of developing its new country programme document and strategy notes for the period 2018–2021. Discussions are ongoing with the DGIS on designing a new WASH programme in a number of countries, including Rwanda. The following recommendations are proposed (and further developed at the end of the report) with the hope that they can feed into these processes and support the implementation of the new sector policy. Several of the recommendations are already outlined in the 2016 rural water supply sustainability action plan. Although the recommendations below are presented in a structured and logical way, they should be considered as a menu of options rather than a plan of action. The most appropriate options for UNICEF will depend on numerous factors, including the dynamics in the sector, the strategic vision of the UNICEF country office for its assistance to the country, the resources at its disposal and the positioning of other RWS donors and stakeholders.

Continue to support service upgrade and expansion…

1. In collaboration with other RWS stakeholders, advocate to the Government and/or directly support financial measures to incentivize water operators’ engagement in the business, enhance profitability/attractiveness and enable more private investment in service upgrades and extensions. Examples of incentive measures are suggested at the end of the report.

…without leaving the most vulnerable behind

Further incorporate equity considerations at all stages of the programme cycle, as the poor are most at risk of being left behind with the expansion of piped networks and the shift to profit-oriented management models. In particular:

2. Define vulnerable/priority geographical areas and population groups and determine a resulting targeting strategy and process in collaboration with other UNICEF sections, RWS donors and the Government.

3. Continue to advocate to the Rwanda Utilities Regulatory Authority (RURA) and the Government for the better inclusion of equity considerations in the upcoming review of the water tariff structure, based on the results of the latest sustainability check or a more specific pricing/affordability study modelling various arrangements and scenarios. Advocacy messages could focus on the following priorities:
   - Harmonizing tariffs across different types of systems (gravity-fed, pumping, etc.) and districts for more equality between similar users benefiting from the same level of service;
   - Ensuring that each operator has a mix of systems to enable a reasonable level of profitability;
   - Ensuring cross subsidy between the richest and poorest consumers by varying the tariff base (e.g. on consumption, household classification under Vision 2020 Umurenge Programme/poverty classification, etc.);
   - Clarifying and streamlining the tariff and subsidy systems accordingly in PPP contracts and in district and operators’ training.

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4. Support the protection and development of springs as an interim measure for agglomeration points awaiting the installation of piped systems or for more remote and poorer communities and households. Alternatively, UNICEF could look into the broader community-level water safety planning approach that is being piloted by UNICEF and the World Health Organization (WHO), notably in the East Asia and the Pacific region, and/or support the enabling environment for household self-investment.

5. Set up an equity-focused RWS programme monitoring-evaluation-reporting system.

Support service sustainability with improved regulation and accountability arrangements

Balance the engineered, top-down, and privately-managed/profit-oriented RWS models through enhanced regulation and bottom-up accountability mechanisms.

6. Continue to support the RWS sector, particularly RURA, in their plans to:
   - Refine tariff schemes (as described above);
   - Establish standard management and affermage contracts;
   - Define and systematically populate RWS key performance indicators (indicators to be aligned with sector best practices and Sustainable Development Goal (SDG) reporting requirements); harmonize and strengthen the reporting indicators, template and procedures to be used by water operators to report to districts, WASAC and RURA, accordingly;
   - Monitor water quality;
   - Use collected data for benchmarking purposes, sustainability and equity analysis, and developing capacity-building plans/activities;
   - Institutionalize and embed aspects of the sustainability check approach into regular sector monitoring by districts and RURA to ensure timely support to service providers and appropriate course correction.

7. Support additional mechanisms for users to voice their demands and for responsible entities (districts, operators and WASAC) to receive timely information about user experience and service quality. Close the accountability loop by enabling user feedback to be passed up to the national regulatory agency through the following:
   - Support the creation of WhatsApp groups in all districts (replicating the positive experience of one district) or other smartphone-based real-time monitoring technologies or other appropriate information and communication technologies;
   - Support the establishment of a communication platform between the national federation of private operators (which already exists) and a similar national federation of water user committees (which could be created).

Strengthen synergies with other WASH and non-WASH interventions

8. Strengthen the sanitation and hygiene programme component and its interlinkages with the rural water supply interventions. Suggestions are made at the end of the report.

9. Continue to strengthen synergies with other sectors/sections within and outside UNICEF, notably health, nutrition, education, protection and Communication for Development.
B. Overview of the global evaluation

B.1. Rationale and objectives

This country case study report is a component of the global evaluation of UNICEF’s drinking water supply programming in rural areas and small towns between 2006 and 2016. The global evaluation was commissioned by the Evaluation Office at UNICEF Headquarters in New York. It was designed to assess UNICEF’s experience with drinking water supply programming in rural areas and small towns to fill specific knowledge gaps, draw lessons and improve the appropriateness of UNICEF strategies globally and the quality of its programming in the field. In doing so, the evaluation will inform the development of the water, sanitation and hygiene (WASH) component of the UNICEF Strategic Plan 2018–2021 and guide UNICEF into the new Sustainable Development Goal (SDG) area. The evaluation also aims to contribute to global learning and promote UNICEF’s accountability to internal and external stakeholders. It examines both downstream work in service delivery and upstream work in strengthening the enabling environment for the rural and small town drinking water supply (RWS) sector at the national and global levels.

B.2. Evaluation design and criteria

The global evaluation is structured around six main evaluation criteria and six key evaluation questions listed in the first two columns of Table 1. The eight country case studies use the same six evaluation criteria and key evaluation questions. They form one component of the evidence base for the global evaluation, which also includes a review of UNICEF and non-UNICEF documents and databases, a global online survey and semi-structured interviews with a diversity of sector stakeholders. The areas of particular interest for the country case studies are listed in the third column of the table.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Key global evaluation question</th>
<th>Areas of particular interest at country office level</th>
</tr>
</thead>
</table>
| Relevance | Has UNICEF been a well-positioned, credible partner for national governments and major development agencies, demonstrating alignment and complementarity both globally and within countries? | • UNICEF’s position in the field of rural and small town drinking water supply (RWS)  
• The credibility, adaptation and complementarity of UNICEF’s activities with those of its partners and of the other major in-country players |
| Effectiveness | To what extent has UNICEF a) achieved its global and country output and outcome level targets through quality programme implementation; and b) effectively contributed to the water-related Millennium Development Goal (MDG)? | • Achievement of output and outcome level targets in country and contributions to the MDGs  
• Success of policy advocacy, capacity-building and knowledge generation/management activities  
• Quality of programme implementation |
### Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Key global evaluation question</th>
<th>Areas of particular interest at country office level</th>
</tr>
</thead>
</table>
| Efficiency          | Has UNICEF maximized the costs-results relationship by systematically integrating efficiency considerations into its activities at global, regional and country levels, notably by promoting integrated programming and partnerships with other WASH and non-WASH initiatives? | • Relationship between costs and results  
• Use of cost-efficient approaches and measures, including engagement in integrating water supply interventions with other WASH (e.g. sanitation and hygiene) and non-WASH interventions |
| Equity              | What has been the level of equity-sensitivity in the design, implementation and monitoring and evaluation of RWS activities at global, regional and country levels?                                                                | • Geographical targeting at the country level  
• Equity sensitivity of the UNICEF RWS programming, including in the monitoring and evaluation systems                                      |
| Sustainability      | Has UNICEF integrated appropriate measures and tools at all levels and achieved a satisfactory level of sustainability in its drinking water supply programming in rural areas?                            | • Evidence on the actual level of sustainability of past interventions  
• Extent to which the technical, financial, social, institutional and contextual factors known to support water supply sustainability have been taken into account in UNICEF’s water supply programming  
• The sustainability lens in UNICEF monitoring and evaluation and information management systems |
| Innovation / upscaling | Has UNICEF been able to identify and test new programmatic approaches and take them to scale if successful?                                                                                                                             | • Private sector participation in the management of RWS services  
• Real-time monitoring  
• Sector regulation and accountability arrangements  
• Innovative financial mechanisms to support access to the service |

### B.3. The role of the country case studies

Country case studies are not country evaluations. They are used to document some but not all of the evaluation questions and indicators. The objective of the country case studies is to bring additional evidence from the country/field level and document some country specificities, feeding into the global evaluation report. At the same time, the evaluative country case study draws findings and makes recommendations intended to be useful at the country level.

### B.4. Rwanda country case study methodology

The in-country visit took place in January 2017. See Annex 1 for a full itinerary of the mission.
B.4.1. Data collection methods used

a) Semi-structured interviews and (focus) group discussions

Semi-structured interviews were conducted in Kigali and semi-structured interviews and group discussions were also held in the field. These interviews and group discussions were carried out with UNICEF staff, key partners and beneficiaries as well as other RWS stakeholders at local and national levels, including sector ministries, main donors, international governmental organizations and NGOs. See Annex 2 for the list of stakeholders interviewed.

b) Field visits and meetings/interviews with local stakeholders

A field visit enabled the evaluation team to build a better understanding of the local context, interview local/sub-national stakeholders and private operators, obtain an overview of UNICEF-supported interventions during the evaluation period and collect (limited) field data, particularly on the sustainability and equity aspects. In each community visited, the evaluation team used a structured observation protocol, which included qualitative information such as pictures, videos and interviews with local stakeholders, the community leaders and water users. In total, the team travelled to four districts (Burera, Musanze, Nyabihu and Rubavu) and conducted interviews with district mayors and other (current and former) elected officials, private operators, water vendors, community leaders and community members. Annex 3 provides a list of the specific sites that were visited.

c) National and sub-national workshops

The national and sub-national workshops were compressed into one workshop because the rural water sector is relatively small in Rwanda. This workshop enabled opinions to be collected from a larger group of stakeholders to supplement the individual interviews and helped build a certain level of consensus in the responses to the evaluation questions, or at least ensure triangulation.

The workshop was held in Musanze, a city in the Northern Province of Rwanda, on 19 January 2017 and was attended by a total of 49 people listed in Annex 2. Attendees included representatives from UNICEF, the Ministry of Infrastructure, the Ministry of Health, WASAC, WHO, WASH NGOs and donors, and local private operators. The institutions involved have significant experience in rural and small town drinking water supply (RWS) in Rwanda. Individual participants were invited due to their familiarity with UNICEF programming and the RWS sector.

d) Document review

A number of national government documents, national WASH sector documents and UNICEF public and internal documents were reviewed. These are listed in Annex 4.

e) Wrap-up meeting between the evaluation team and UNICEF Rwanda

A wrap-up meeting was held on 20 January 2017 at the end of the country visit with representatives from UNICEF Rwanda. The evaluation team presented the key preliminary findings and general trends identified during the field visits, stakeholder/group interviews, and workshops, in order to gather and incorporate feedback.

f) Review of the draft country case study report

The draft country case study report was quality reviewed by both UNICEF Rwanda and the UNICEF Evaluation Office, and further edited by the Evaluation Office in coordination with the evaluation team before finalization.
B.4.2. Methodological limitations

The country case study was led by two different experts during weeks one and two of the country mission. In order to ensure this organizational change did not hamper the evaluation, the evaluation team held a four-hour handover meeting with all staff to bring the second team leader up to speed.

Some documents, data and key informants were not accessible to/accessed by the evaluation team, which provided information on the earlier years of the period under review. This is the reason why this country case study report mainly focuses on the last seven years of the evaluation period and in particular on the larger and well-documented programme funded by the Directorate General for International Cooperation of the Netherlands (DGIS).
C. Country specificities regarding RWS

C.1. Service coverage

Over the past 25 years, Rwanda has made good progress towards increasing access to improved water sources, though the country did not achieve the related MDG target.¹ In rural areas, the proportion of the population not using an improved water source for drinking decreased by 15 percentage points between 1990 (43%) and 2015 (28%). 72% of the rural population had access to an improved water source in 2015 (see Figure 1), which is 16 percentage points above the average for sub-Saharan African countries. Overall, 76% of the country’s population (rural and urban) had access to an improved water source in 2015, compared to 58% in 1990.²

Figure 1: Trends in rural and total drinking water access in Rwanda from 1990–2015

Individual household surveys conducted by the National Institute of Statistics of Rwanda (NISR) give slightly different figures than the JMP due to variations in definitions and methodologies (see Table 2). Yet, all sources show limited disparities between rural and urban areas, across regions and across wealth quintiles, which again contrasts with many other sub-Saharan countries.

Table 2: Households with access to an improved drinking water source (%)

<table>
<thead>
<tr>
<th>Area</th>
<th>2005-06 (EICV2)</th>
<th>2010-11 (EICV3)</th>
<th>2013-14 (EICV4)</th>
<th>2015 (CSFVA)</th>
<th>2014-2015 (DHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rwanda</td>
<td>70.3</td>
<td>74.2</td>
<td>84.8</td>
<td>79.0</td>
<td>72.4</td>
</tr>
</tbody>
</table>

² Ibid.
Household survey data also indicate a relatively higher level of service than in other sub-Saharan countries. Between 67% and 74% of the rural population is estimated to have access to a water source that is within 30 minutes away, and between 5 and 6% is estimated to have access to a water source directly on their household premises. Between 27 and 34% use tap water, and only 2% use boreholes. Protected springs are used by 40 to 50% of the rural population.3

### C.2. Factors driving high access rates

A number of factors have combined to create an enabling environment within both the country and the sector contexts over the evaluation period. These factors include:

- The small size of the country, which is one of the smallest in Africa at 26,338 km², the small size of the districts and the high population density at 11.8 million people or 457 inhabitants/km², the highest in Africa4, makes the country easier to administer and develop, which in turn makes piped water network systems a feasible option (local private operators can be found anywhere);

- The availability of the resource in most parts of the country, both from the groundwater table and the regular rains provided by two rainy seasons, makes it easier to provide the rural population with access to water;

- The hilly terrain is both a challenge and an opportunity for Rwanda. It creates a technical challenge for developing and maintaining water infrastructure, particularly in rural areas (installing pipes at the appropriate depth underground despite uneven slopes, erosion and landslides, etc.), and for facilitating access (need to travel up/down the hill). The terrain,

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however, also provides an opportunity for developing protected springs and gravity-fed water supply systems;

**Figure 2: Hilly terrain in Rwanda, Nyabihu district**

- Political stability and government leadership through implementation of the national reconciliation policy and reconstruction of institutions after the genocide;

- Ambitious national development goals defined in the Government’s Vision 2020 and the Economic Development and Poverty Reduction Strategy, which aim to transform the country from a low-income agriculture-based economy to a knowledge-based, service-oriented economy with a middle-income country status by 2020;\(^5\)

- Strong economic and social development over the past 15 years, with gross domestic product (GDP) annual growth of 8% between 2001 and 2015 on average, a GDP per capita that tripled over the period\(^6\) and an increase in the Human Development Index from 0.33 to 0.483.\(^7\) Inequalities have also declined. The number of people living below the poverty line fell from 61% in 2000 to 39% in 2010, and the proportion of the population living in extreme poverty also decreased by 20 percentage points from 37% in 2000 to 16.3% in 2014;\(^8\)

- The decentralization and community development policies, which aims to transfer powers, authority, functions, responsibilities and the requisite resources from central government to local governments or administrative divisions, and develop social services at the local level, targeting people’s needs while improving efficiency and effectiveness and increasing government accountability;\(^9\)

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• A series of initiatives to improve public service governance and the coordination of donor interventions:
  - The performance contracts (imihigo) signed between the President and the district mayors, who are held accountable for results based on annual objectives and indicators for districts (including for water and sanitation) aligned with national development objectives;
  - Anti-corruption reforms;
  - Expansion of PPPs and independent regulation as a government strategy;
  - Donor mapping and sectoral and geographical redistribution in 2008, which was endorsed by 15 major development partners, including four non-European Union bilateral and three multilateral development partners, and later by all 16 United Nations agencies active in Rwanda. It is to be noted however that this re-distribution has left a limited number of partners in the WASH sector.

• A strong and relatively exhaustive legal framework that identifies the water and sanitation sector as a clear national priority; and a clear and well-structured institutional setup (see Section C.3).

These features provide a conducive environment and incentives for progress at all levels of the administration. They have helped increase the level of confidence among development partners in government bodies and processes and have facilitated development cooperation. They have also made it possible to increase water and sanitation coverage and scale up successful initiatives.

Rwanda’s water sector still faces a number of challenges, however. The country is facing economic water scarcity, mainly due to the lack of water availability in some areas, the population growth and density, the demands of intensified socio-economic development, and land degradation.

C.3. Legal framework and institutional setup

Rwanda’s Vision 2020 establishes access to water as a high national priority and outlines a plan for delivering universal access to water and sanitation services by the year 2020. It promotes a sustainable and integrated approach for the sector as well as the right of every citizen to have access to clean water: “The Water and Sanitation Sector aims to ensure sustainable and integrated water resources management and development for multipurpose use including increased access to safe water and sanitation services for all”.

The Vision 2020 also recognizes the need for gender balance in water service management, promotes a participatory approach to

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10 In 2008, a donor mapping showed that Rwanda’s 30+ development partners were not adequately distributed across all sectors, leading to duplication of efforts and funding excess in some sectors and de-prioritization and under-financing in others. Based on these results, the Government of Rwanda developed a division of labour proposal that was presented to development partners. After intensive discussions and bilateral negotiations, the proposal was endorsed by 15 major development partners, including four non-European Union bilateral and three multilateral agencies and later by all 16 United Nations agencies active in Rwanda. Source: Organisation for Economic Co-operation and Development, ‘Rwanda: An Example of Country Leadership in Division of Labour’, 2011.


water service delivery and determines the need for water subsidies for the social and economic good. The revised version (2010) also introduces the concept of equity.

The Policy and Strategy for Water Supply and Sanitation Services was adopted in 2004 and revised in 2010 and 2016 to reflect institutional reforms that have substantially changed the sector context. These include the decentralization of responsibilities for rural water and sanitation services to the districts, the emphasis on private sector participation, the progressive evolution towards a sector-wide approach, the creation of WASAC and the increasing involvement of RURA in rural water supply services.14

Formal performance contracts established between the Government and the districts contain agreed objectives and enable monitoring of the activities described in the annual work plan. Since 2006, district authorities sign annual performance contracts (‘imihigo’) with the President, and public servants in local technical departments sign similar contracts with the heads of their line ministry. Signatories are held directly accountable for achieving the annual objectives set out in the contract and report to the central level annually and at the end of each contract period. Reported results are verified by government auditors. Districts are then ranked, and the ranking is made public as an additional benchmarking-based incentive for performance. Sanctions can be applied for poor-performing district officials.

Water supply and sanitation was initially placed under the mandate of the ministry in charge of the environment, and later under the Ministry of Infrastructure. Within the Ministry of Infrastructure, the Directorate of Water and Sanitation is in charge.

Created in 2014, WASAC is the heir of the former national water, electricity and gas company. It is a State-run utility company responsible for supporting/overseeing districts, community-managed systems and small private service providers in rural areas. WASAC is also responsible for directly managing the water supply service in urban areas. This means that there is a single company responsible for water across the entire country, whose responsibilities in rural areas differ from those in urban settings. WASAC also holds a monopoly on the importation of chlorine.15

Formally established in 2013, RURA is mandated to oversee RWS services. RURA aims to promote fair competition and the sustainable and efficient use of water resources and to ensure that water service providers offer good quality of service in regards to drinking water. RURA licenses water service providers; monitors licensee compliance with laws, standards and license terms and conditions; ensures the quality of service in water service delivery; monitors the performances of service providers; advises the Government on policies relating to water; and performs audits and inspections of water service providers to assess service provision.

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D. UNICEF RWS programme description

Since the 1994 genocide and during the period under review, UNICEF progressively evolved from emergency-focused to more development-oriented water supply programming, and the size of the programme increased. In total, it is estimated that more than 700,000 people benefited from improved access to water supplies between 2006 and 2016 as a direct result of UNICEF support.

D.1. Until 2009: A strong emergency focus

In the years leading up to 2009, UNICEF focused primarily on hardware, including the construction/rehabilitation of community-based water supplies as well as the response to emergencies such as earthquakes, refugees/returnees and disease outbreaks. Activities also included improving access to and the use of safe water (and sanitation) in schools and health care facilities. At that time, UNICEF was already supporting development-oriented activities such as extending existing water networks and improving management arrangements alongside post-genocide reconstruction projects and emergency response.

WASH had the status of a small unit within UNICEF, with a team of two national WASH officers who were supervised by the head of the Child Survival, Growth and Development section. With an annual budget of 1-1.5 million USD, UNICEF’s RWS interventions reached some 50,000 beneficiaries each year in 18 out of 30 districts in the country.

D.2. Since 2009: DGIS-funded WASH development programme

In 2009, a DGIS-funded 23.7 million USD programme was launched for a period of five years and was subsequently extended through 2015. This substantial funding marked a turning point in UNICEF water supply programming because it gave UNICEF the opportunity to develop a longer-term vision and revise the programme scale and strategy/content.

In terms of scale, the annual budget was double that of the previous period, with DGIS funding making up more than 70% of the WASH budget. The DGIS-funded programme was also one of the largest RWS initiatives in the country, though it only focused on four north-western districts: Burera, Musanze, Nyabihu and Rubavu (see Figure 3). WASH became a distinct section within UNICEF Rwanda, and an international staff member was recruited to lead a team of two to three national professionals. Between 2010 and 2015, UNICEF reported some 600,000 beneficiaries, including 515,000 reached as a direct result of DGIS funding.
In terms of strategy and content, the objectives of the DGIS-funded programme were comprehensive and development oriented: to supply safe and sustainable water to 500,000 users (400,000 new users and 100,000 supplied through rehabilitated water supply systems). Although boreholes and protected springs were developed during the initial stage, UNICEF mainly focused on the delivery of multi-village piped network systems. In contrast to the pre-DGIS period, hardware activities were accompanied by the following components:

- Substantial district-wide sanitation and hygiene promotion activities as part of the national Community Based Environmental Health Promotion Programme, adopting the Participatory Hygiene and Sanitation Transformation (PHAST) approach and coupled with training of community and school health clubs;
- The development of PPPs for the management of piped networks;
- A capacity-building and learning component;
- A pilot/modelling approach linked with an upstream agenda: policy advocacy to mainstream the approach in government strategies and to take the pilot to scale.

With this programme, UNICEF moved away from implementing mainly through NGOs and with line ministries as its primary partners and towards direct engagement with intervention districts. Districts became responsible for the procurement and supervision of construction work as well as the implementation of PHAST activities. The Government of Rwanda was responsible for stakeholder coordination and technical support through the line ministry, WASAC and a programme coordination unit. The national Government and districts contributed co-funding and staff.
UNICEF was responsible for training, technical assistance, procuring some supplies, monitoring and quality assurance. Capacity-building activities at the national and district levels were designed to enable counterparts to carry out procurement, manage programme funds and support the development of water services and private operators. These activities were mainly provided by the Dutch NGO SNV under a programme cooperation agreement (PCA) with UNICEF. Community mobilization and sensitization activities at the community level aimed to stimulate ownership and support the appropriate use of water infrastructure. During this period, UNICEF continued to engage in emergency programming including in refugee camps.

The PPP model and the role of SNV in the programme are presented in an online video, ‘SNV CASE PPPs in water and sanitation sector’, available at: www.youtube.com/watch?v=IaRTdW7dyGU.
E. Evaluation findings

E.1. Relevance

UNICEF's positioning, role, added value and credibility in the RWS sector over the last 10 years

E.1.1. Alignment

UNICEF Rwanda’s programming was well aligned with the successive national policies and strategies and with sector needs. This alignment increased over time with the increased investment in development programming and system strengthening.

The formulation of the DGIS-supported programme coincided with the development of the new sector policy and strategy for 2010 and was carefully and collaboratively designed by UNICEF with the Government of Rwanda and the districts. The preparation workshops served to involve stakeholders in problem identification, the development of a cause-effect problem tree, the development of an objective tree and logical framework, and the development of appropriate implementation arrangements. The workshops were therefore very useful for building consensus and ownership and resulted in a high degree of alignment with government and district orientations and procedures. This alignment was seen in:

- The mode of implementation, as UNICEF Rwanda moved away from implementation through NGOs and adopted a district-based approach. UNICEF channelled funds directly to districts and reinforced the decentralization efforts of the Government while strengthening district capacities for project management. This supported district and government processes and ownership;
- The development by UNICEF of annual work plans in collaboration with both the district and central governments. At the district level, these contributed to the development of district development plans. UNICEF’s programme activities are included within the district budget and plans, and within the performance contracts of the district mayors and WASAC;
- The move towards a higher level of service through the development of multi-village piped networks brought water closer to communities, particularly those on ridges and hilltops. As this met the demand of a population whose standard of living and purchasing power had increased over time, a few years into the DGIS programme implementation, UNICEF and the Government decided not to repair the remaining boreholes and instead focus on piped schemes;
- The adoption, refinement and replication of PPPs as per the sector policy;
- Water tariffs that balance financial viability and affordability considerations (see sections on sustainability and equity);
- Integration of RWS interventions with hygiene and sanitation promotion;
- Gender inclusion;
- UNICEF’s involvement in and considerable support for sector coordination platforms and technical working groups.

16 This consultation process is well described in the programme proposal to DGIS, 2008.
E.1.2. **Complementarity and added value**

After 2009, and with the DGIS-funded programme, UNICEF’s added value grew due to:

- The combining of RWS with sanitation and hygiene promotion, which other development partners reportedly did not do as consistently as UNICEF;
- The geographical distribution of donors across districts and UNICEF’s focus on RWS in four districts based on the donor mapping and an effort to avoid overlaps and duplication of efforts;
- Continued involvement in sector coordination and learning/sharing initiatives with the Government and development partners, making the best use of the organization’s positioning in the sector and experience in the field;
- The combining and linking of downstream and upstream work, which became clearer at the end of the evaluation period. The DGIS-supported programme provided the funding and the time to design an intervention model for developing RWS and improving service management and governance arrangements. These models were not new but were further rolled out and refined by UNICEF and partners in the four intervention districts. They were then adapted and replicated by other districts and development partners and encouraged/mainstreamed by the Government, benefiting the entire sector. Experience and lessons learned from field implementation informed UNICEF’s policy advocacy, with an emphasis on sustainability and, to a lesser extent, equity (see section on innovation);

Because of its model of implementing through districts and the Government’s coordination role, some stakeholders interviewed stated that “UNICEF’s role and strength is that of advocacy and driving force for the sector – not in field implementation”; “UNICEF is considered a leader in upstream work”; “in the field, it serves as a funder for implementing partners”. In the field, UNICEF’s added value was described by an implementing partner as follows: "They have goals that are in line with our own development goals. Additionally, UNICEF's geographic coverage is large as is the programme scale and integrated approach. We choose to join them so we can have an impact too".

E.1.3. **Credibility**

UNICEF credibility increased over time as its experience and contributions to sector funding grew, particularly through the formulation and implementation of the DGIS programme. The following were all mentioned by key sector stakeholders as factors that make UNICEF one of the most credible partners in the RWS sector in Rwanda:

- UNICEF has a long-standing and continuous presence in the country and locally acting across the humanitarian-development continuum;
- UNICEF’s contribution to sector funding is significant at the national level and in their target districts;
- UNICEF works closely with the Government, districts, WASAC and other sector stakeholders;
- UNICEF is active at all levels, from field interventions to policy advocacy and system strengthening; it is perceived as one of the few development partners in the sector that is able to influence government sector policies, along with the World Bank, the Japan International Cooperation Agency and the African Development Bank;
UNICEF works in areas where there is a strong need. UNICEF is largely perceived as appropriately focusing its interventions on vulnerable areas.

UNICEF has a reputation as being trustworthy, and its WASH staff are seen as competent, demanding quality and delivering results. The desire to uphold UNICEF’s reputation also motivates the districts to make the necessary efforts to deliver and put pressure on their own contractors. In some district authorities, interviewees mentioned that their credibility as a contracting authority had improved thanks to UNICEF’s work with them – by strengthening their procurement capacity and ways of working in the eyes of potential contractors. Contractors reported having bid on UNICEF-funded construction and management contracts because working for UNICEF would positively affect their reputation and because they trusted that they would be paid (as long as they completed timely and quality work).

E.1.4. Conclusion on relevance

The UNICEF water supply programme was well positioned, relevant and added value within the context of Rwanda, and its relevance improved throughout the period under review.

E.2. Effectiveness

Degree to which UNICEF-funded programmes have produced the desired results through quality implementation, including in capacity building, knowledge management and policy advocacy

E.2.1. Quality of the construction process

Supervision of construction work involved close supervision by independent engineering firms and periodic field visits by the district water engineer and UNICEF. The use of checklists and inspections on points of control at critical moments in the construction process ensured that construction quality was generally good, as found in successive sustainability checks (see below) and field observations.

However, three recurrent issues were noted:

- The quality of the hand pumps, which were reported to be often without stainless steel, and wider issues around their siting and water quality;
- The lack of pipe protection and erosion control leading to infrastructure being vulnerable to damage;
- Lack of catchment protection at some sources and drainage issues around water points, generating stagnant water and therefore creating the potential for diseases.

E.2.2. Capacity building

Since 2009, UNICEF has focused on capacity-building interventions, notably during the implementation of the DGIS-funded programme. Substantial attention and funding has been allocated to this component, and a specific capacity-building implementing partner (SNV) has been appointed. According to UNICEF, 30,000 people have been trained at all levels, including from the Government and WASAC, as well as district staff members, private operators and community members. Interviews held with partners and beneficiaries showed that there was a wide range of training topics, which were perceived as relevant/useful by participants and
corresponded to their needs. A brief review of training materials revealed varying levels of quality in terms of content and methods.

According to interviewees, areas where more training and guidance were needed related to monitoring, reporting and regulation indicators, procedures and tools as well as water treatment and quality monitoring.

E.2.3. Upstream work

UNICEF Rwanda made meaningful contributions to sector development and policy formulation based on its experience and lessons learned from downstream work. The Country Office’s engagement in this area seems to have been continuous over the evaluation period. For example:

- From 2006 to 2007, UNICEF advocacy brought WASH-related challenges to the forefront of the national agenda. This contributed in turn to the WASH sector becoming a government priority, along with the health and education sectors. The Government increased the WASH sector budget over time and leveraged more resources from development partners, including UNICEF. In 2015, UNICEF again contributed to concept papers on prioritizing WASH that resulted in increased sector allocation from the Government in early 2016.

- The Water and Sanitation Sector Working Group, which linked all players (the Government, NGOs and international organizations) was formed in 2006. Group discussions guided sector changes and led to policy formulation/revisions in 2010 and 2016. The UNICEF Rwanda WASH team played a strategic coordination role in this working group to ensure programme outputs and outcomes remained high on the sector’s radar and to mainstream key lessons learned from its programmatic experience.

- Since 2009, the scale and focus of the DGIS-funded programme provided UNICEF with the government-level credibility and leverage required to work on upstream issues such as policy advocacy, tariff setting, regulation and the enabling environment.

It is noted, however, that UNICEF has not conducted a detailed situation and bottleneck analysis for the sector context and its enabling environment to inform its upstream agenda.

E.2.4. Knowledge management and monitoring and evaluation

UNICEF developed and tested a model for RWS to increase service coverage and sustainability and then advocated for mainstreaming this model. Although the model was considered relevant by UNICEF staff and sector stakeholders, the mainstreaming scale up was based on limited documented evidence.

As part of UNICEF’s commitment to DGIS, sustainability checks were conducted in 2011, 2013, 2014 and 2016 to assess programme effectiveness and sustainability (at the output rather than outcome level). These field surveys had limited statistical representativeness and no comparative dimension (e.g. with non-intervention sites or other donors/NGOs).

There was no RWS-related study or evaluation produced or supported by UNICEF during the period under review. In particular, what would have been useful and timely to undertake (possibly in partnership with other sector stakeholders such as the Work Bank or SNV) is an in-depth study/evaluation to compare PPP arrangements for piped network systems with other types of community and district managed systems in terms of technical performance, financial and commercial viability, community ownership and affordability, in order to inform successive policy revisions, implementation guidelines and contractual arrangements.
During the workshop, district representatives also advocated for support with evidence-based financial planning to reach full coverage and, more broadly, with cost studies in order to provide evidence to potential private operators on the cost-effectiveness of water service investment and the profitability of the business.

Accountabilities, indicators and reporting templates were defined for monitoring services and private water operator performance with UNICEF support. District staff conducted audits of private operators. The capacities of trained private operators and district staff to accurately and consistently populate indicators and use the provided templates remain uneven, however. RURA is still in the process of developing a robust database and gathering data that enables such analyses. UNICEF’s support to RURA has so far been limited, except in the area of water quality monitoring. However, UNICEF is currently planning to increase its engagement with the regulation agency.

### E.2.5. Weaknesses

Some of the weaknesses observed in terms of effectiveness include:

- **Boreholes:** Initially, boreholes fitted with hand pumps were implemented as a quick fix to improve access to water and were mentioned by some UNICEF staff as a “transitional technology” for this volcanic region. While the boreholes delivered a service, they remain difficult to maintain, both in terms of water quality and repairs. Due to lack of attention/priority on the part of the districts and the Government of Rwanda, tariff policy has not been enforced at these water sources, which may be due to the poor water quality of these sources undermining their perceived value as water supply points, at least in the four intervention districts.

- **Water quality:** There is a lack of willingness among most water operators, except Aquavirunga, to treat the water (probably for financial reasons). There has also been insufficient operator training, and no effective incentives and sanctions have been applied by districts, WASAC and RURA, despite contractual provisions and periodic audits by districts. Chlorine is available locally, but service providers interviewed stated that using this supply chain results in delays in chlorine delivery. This indicates weaknesses in the supply chain between WASAC, the districts and private operators.

### E.2.6. Conclusion on effectiveness

Overall, the effectiveness of UNICEF’s RWS programming is satisfactory. Commendable efforts have been made to achieve the objectives related to service delivery, construction quality and capacity building and have been supported by substantial and longer-term funding from DGIS and a competent and dedicated WASH team. Successful field experiences have inspired other sector players and informed the successive revision of the sector policy. Areas for improvement include: catchment and pipe protection; drainage; procedures and skills for water treatment and quality testing; and monitoring, evaluation, knowledge generation, reporting and regulation.

### E.3. Efficiency

Degree to which UNICEF maximized the costs-results relationship by systematically integrating efficiency considerations in its programme design and management

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17 The water treatment issue was highlighted in reviewed audit reports of private water operators but no accompanying recommendation was made at the end of the report, suggesting that it was not a district and WASAC priority concern.
E.3.1. Human resources

The UNICEF WASH team and associated programme management costs were particularly low at the beginning of the evaluation period. These increased with the DGIS programme, yet remained very reasonable. Therefore, overall, delivery through district authorities and SNV enabled UNICEF to maintain a relatively lean in-house team.

Many people interviewed highlighted that the competence, foresight and dedication of the UNICEF WASH team in general, and notably of the section chief, played a significant role in programme effectiveness and UNICEF’s recognition within the sector more broadly.

E.3.2. Technology choice

As previously mentioned, UNICEF and the Government made an appropriate choice by developing piped network systems, though these tend to have higher per capita unit costs than other technology options such as boreholes, spring catchment, development, protection and self-supply options. An evaluation conducted by the World Bank in 2008\(^\text{18}\) at the end of a similar RWS project, calculated an economic internal rate of return of 6.9% for new piped network systems (13.6% for gravity-fed systems and 3.6% for pumping systems). Rehabilitations had a higher economic internal rate of return (9.8%) because of the lower investment cost.

The same evaluation showed a much higher rate of return for spring protection (65.4%) for the same reason. From an efficiency perspective, such investment could have been included as part of UNICEF’s RWS programming throughout the period under review (see section on equity). However, this was only the case in the earlier years and at a limited scale.

The economic internal rate of return for boreholes has not been calculated. However, given the limited interest of the Government, districts and other users in them, as well as their sub-optimal construction quality and poor sustainability (see sections on effectiveness and sustainability), investment in boreholes seems to be inefficient except in situations where other alternatives are not appropriate or feasible.

E.3.3. Timeliness

Programme activities were completed in a timely manner despite the ambitious objectives. Delays related to procurement, funds disbursement and construction activities are common in both developing and developed countries, and Rwanda is no exception. As described below, UNICEF took steps to minimize these over the course of the evaluation period.

For the DGIS programme in particular, the establishment of a national management unit and the recruitment of a technical assistant within the Ministry of Infrastructure were reportedly instrumental to programme effectiveness and efficiency. They coordinated funds requests and reports from districts, provided advice and support to the district and channelled communications to UNICEF. This reportedly expedited decision making and problem solving and addressed the initial delays experienced in the disbursement of DGIS funds to districts.

The RWS component was completed within the initial timeframe. The extension of the DGIS-supported programme implementation period was due to delays in the implementation of the WASH-in-schools component. UNICEF’s request for a no-cost extension and efforts to raise 2 million USD in matching funds to achieve the agreed targets demonstrate a drive for results.

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E.3.4. Partnership management

In addition to its own matching funds, UNICEF used DGIS funding to leverage additional resources from the Government and WASAC, which helped maximize the relationship between investment and results for UNICEF and the donor. The DGIS programme also included the government-funded provision of staff from WASAC.

When neither government/district partners nor UNICEF had the required expertise in-house, UNICEF appropriately engaged strategic partnerships to mobilize specialist skills (and additional funding), without increasing its staff costs, by signing a contract with SNV.

UNICEF’s strengthened financial procedures and reporting and monitoring processes, introduced in Rwanda in the early 2010s as part of the organization-wide ‘HACT’ (Harmonized Approach to Cash Transfer) reform, improved the level of risk identification and mitigation in partnership management and financial control. Some programme stakeholders expressed reservations, however. Although the decision to fund districts directly is recognized to be relevant and generally efficient, it generated additional work for them because they had to manage funds and report back using UNICEF HACT procedures and templates, which are different from those of the Government. The government systems are reportedly strong and transparent, and some informants suggested that, if funding was channelled through the Government (e.g. the Ministry of Finance) rather than from UNICEF to the districts, it would reduce the reporting workload for both the districts and UNICEF. Secondly, some interviewees reported that UNICEF’s compliance with HACT assurance activities and UNICEF’s investment in building real partnerships with and capacities of its implementing partners were not optimal in terms of frequency and intensity.

E.3.5. Procurement

The strategy of delegating the majority of the responsibility for procurement to districts (or to WASAC when the procurement threshold was exceeded) reduced UNICEF’s administrative and transaction costs. This was deemed relatively low-risk thanks to relatively strong government procedures, controls and anti-corruption policies as well as to the UNICEF/SNV procurement training and guidance provided to help districts take on this responsibility.

This district-based procurement limited the number of potential bidders and the level of competition due to the restricted geographical area covered. However, some UNICEF-funded activities were merged with other district bids/contracts to create larger lots, generate economies of scale and reduce unit costs. Long-term arrangements were also signed to ease the burden of procurement.

This series of arrangements improved efficiency and allowed a small UNICEF Rwanda WASH team to operate a large WASH initiative. Another stated benefit of this procurement strategy was that it shifted the legal liability from UNICEF to the Government, reducing UNICEF’s exposure to risk.

UNICEF and SNV also helped streamline the procurement process for private operators using revised and harmonized bidding documents and made their selection more competitive, in line with the sector policy. These improvements supported lower costs, better service performance and improved results for beneficiaries.

E.3.6. Programme integration

Since the mid-2000s, in its successive country programme documents and annual reports, UNICEF Rwanda has remained committed to programme integration as a way of maximizing results while reducing operational costs. However, the document review, interviews and field visits
suggest that this principle was not consistently applied for rural water supply throughout the evaluation period. As described earlier, RWS interventions were indeed combined with sanitation and hygiene promotion under the umbrella of the national Community Based Environmental Health Promotion Programme, as per the sector policy. However, the proportion of households that declared having received hygiene related messages (around 60%) and benefited from a training (25%) was sub-optimal. Furthermore, UNICEF WASH interventions in schools and health centres were not systematically implemented in the same communities as RWS interventions were, suggesting a missed opportunity in terms of cost control and impacts for children.

In regard to the integration of RWS/WASH and other UNICEF, non-WASH activities (health, nutrition, etc.), a few joint projects were developed and implemented towards the end of the evaluation period, notably to fight stunting, which suggests a positive trend. However, the new draft WASH proposal submitted to DGIS does not include a cross-sector component and, even when there were joint projects, the various components seemed to continue to take place in silos, with no actual convergence in terms of the planning and coordination processes, intervention strategies, implementation methods, etc.

UNICEF WASH staff and senior management listed a number of obstacles to more successful programme integration:

- The orientation towards sector specialization, tendency to work in silos and UNICEF’s compartmentalized organizational structure, in which WASH is part of or separate from other sections, such as child survival and development.
- Donors and government partners: they have their own specific interests in particular sectors and work in silos, and are not always interested in cross-sector work.
- Lack of involvement of other sections at the programme/project proposal formulation stage.
- Different/conflicting indicators and eligibility/prioritization criteria for targeting beneficiary communities.
- Lack of vision in the past from UNICEF senior management on how to practically improve integration. This has evolved over the past few years, with a push from senior management that is reflected in country programme documents. In the current country programme document, there is a move toward a clearer and more structured approach to integrated programming with the identification of four priority areas for further integration – stunting; adolescents; people with disabilities; and early childhood development – and WASH is part of all four areas.
- Within the sector, programmatic integration is championed as maximizing impact and catalysing efficiency. Others within the sector suggest that a stand-alone WASH programme would increase the visibility of WASH and ultimately lead to more funding and influence within the sector.

Overall, there seems to have been a slow and uneven shift towards applying the principle of/commitment to integrated programming in UNICEF RWS programming in particular and more broadly within UNICEF programme (and the programming of other development partners).

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19 UNICEF sustainability check 2014.
20 There was no WASH section before 2009. The two national WASH officers were part of the child survival, growth and development section. Between 2009 and 2012, these officers were part of a stand-alone WASH section headed by an international WASH professional. For the period of the 2014-2018 Country Programme Management Plan, the WASH team was reintegrated under the umbrella of the child survival and development section.
E.3.7. **Conclusion on efficiency**

The efficiency of UNICEF’s RWS programming in general and of the DGIS-supported programme in particular is considered satisfactory. Improvements and course corrections have been made in all examined efficiency aspects/factors throughout the evaluation period. Main areas for improvement are integrated programming and the promotion of low-cost technological options where relevant and feasible.

E.4. **Sustainability**

UNICEF’s contribution to RWS sector strengthening and sustainable services.

E.4.1. **Measures supporting sustainability and the outlook for future sustainability**

A 2009 study on PPPs\(^{21}\) and the 2010 Policy and Strategy for Water Supply and Sanitation Services prescribed a number of sustainability measures for rural water supply, most of which were adhered to and some of which were reinforced by UNICEF:

- Contracting locally-based private operators to manage (and sometimes extend) the service through PPP arrangements: Private operators have a vested interest in reducing breakdowns and downtime and increasing user satisfaction. Previous models of management by district or user committees/associations are considered less effective and sustainable in Rwanda. As per the national Policy and Strategy for Water Supply and Sanitation Services and UNICEF’s procedures, operators have been selected based on a competitive process, and contractual provisions have been strengthened and harmonized. Boreholes located within a certain perimeter of the piped water network have been integrated into PPP contracts.

- Professionalizing water operators: Operators have been trained by UNICEF through SNV; performance targets have been defined in their contracts; and operators are being licensed by RURA to professionalize RWS management and enhance regulation.\(^{22}\)

- Empowering districts and making them responsible for the service in line with the decentralization process and the water and sanitation policy: UNICEF effectively involved districts throughout the programme cycle in design and implementation monitoring, which created a high level of ownership according to all programme stakeholders. UNICEF also trained district personnel and all programme stakeholders through SNV to equip them with the information and capacities needed to improve their skills and maintain their efforts. Intervention districts recruited two dedicated, specialist staff to manage UNICEF/DGIS programme activities in the field. They conducted audits of private operators. As per PPP contracts, the districts received a percentage of the private operators’ sales revenues (10 to 15% depending on the contract)\(^{23}\) to finance subsidized delivery to the poor, monitoring, auditing, outreach work, extensions/repairs and district water board activities. Thus, the PPP arrangements made provision for revenues to support the service authority’s direct support costs, which can otherwise be a challenge in many developing countries.

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\(^{22}\) Based on RURA records from January 2017, 48 out of 53 operators currently have licences.

\(^{23}\) Sometimes higher in non-UNICEF supported PPP contracts.
• Ensuring cost-recovery: Running costs for operating and maintaining the water system are
to be borne by the operators based on appropriate user tariffs (excluding replacement of
electro-mechanical equipment). To this end, and as suggested in the Policy and Strategy
for Water Supply and Sanitation Services, UNICEF promoted lower-cost technologies by
favouring gravity-fed systems over pumping systems whenever possible; supported a
review of water tariffs; observed the consumption-based fee approach and the tariff
structure determined by RURA; promoted targeted subsidies to keep the tariff affordable
(see section on equity); and used a cross-subsidy approach by grouping schemes in a
larger contract to a single operator combining schemes with different cost characteristics.
This area-based, ‘bundling’ approach also provides economies of scale for business
operations and thus supports commercial viability. It is noteworthy that interviewed
operators reported a rapid increase in the demand and ability to pay for household
connections, which supports the commercial viability of the business.

• Establishing arrangements to ensure major repair and capital replacement: As per PPP
contracts, it is the district’s responsibility to pay for more substantial repairs above 250,000
Rwandan Francs. This responsibility is widely recognized, and the districts have a budget
line for these repairs that is primarily financed by the fee paid by the private operators and
which is generally used (except on boreholes).

• Extending the duration of operator contracts to support financial viability and private
investments in infrastructure maintenance and development and service upgrades:
Management contracts supported by UNICEF and SNV are typically of a five-year duration.
In some cases, districts have also established longer affermage contracts (up to 15
years).24

• Clarifying and strengthening the role of consumers and user associations (which are not a
contractual party in the PPP contracts between districts and private operators): Training
was provided to all water user committees as well as operators and districts staff on
respective roles and accountabilities. As per the PPP contracts designed with UNICEF and
SNV’s support and confirmed by district staff, water user committees are represented in
units and district water boards (together with other representatives from the communities,
district and water operators). These were revitalized by UNICEF and SNV during the DGIS-
funded programme and serve as an effective communication platform and multi-party
accountability mechanism. User representatives routinely report breakdowns in service
during monthly meetings and more generally represent consumer rights and interests. On
a day-to-day basis, the people in charge can use their phones to make toll-free calls and
report any issues. In one district, a WhatsApp group has been created for the key people
in charge of service maintenance and oversight (mainly operators and districts staff). This
is used to report any issues and repair requirements and confirm once repair has been
undertaken (supported by photos). This increased service provider and district reactivity
and accountability.

In addition to these measures, UNICEF introduced sustainability checks, a donor requirement as
part of the DGIS programme monitoring and evaluation component. These sample-based field
surveys designed to track sustainability issues were repeated by UNICEF every one to two years.
Their methodology has been progressively improved over time. Evidence suggests that UNICEF
has effectively used their results to:

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24 For instance, the private operator Aquavirunga reported to have one management contract and two affermage contracts. These
affermage contracts were not supported by UNICEF, but UNICEF supported the idea of establishing longer term PPP contracts.
• Identify and initiate programmatic improvements, for example: women’s participation in water user committees; capacity building of district staff and private water operators; and benchmarking and performance monitoring of private water operators to increase service functionality.25

• Feed into sector discussions and advocate for greater attention to be paid to sustainability bottlenecks. This resulted in a sector-wide workshop on sustainability being conducted with UNICEF support in early 2016 and the development of a 2016–2018 national sustainability action plan for rural water supply adopted by the Government and development partners in 2016.

E.4.2. Actual sustainability

Sustainability checks indicate a generally satisfactory to high level of RWS sustainability. However, during field visits, a stark difference was observed between the actual sustainability of the piped water systems and springs (generally strong) and of the boreholes (very weak). Regarding piped systems:

• All piped water systems visited were functional. They tended to be of good construction quality and there were limited breakdowns (aside from pipe breakages due to agricultural activities and erosion). Districts, operators and users all reported that downtime dramatically decreased since PPPs were established, to 24 hours or less, barring any major repairs, which can take two to three days. In the 2011 and 2014 sustainability checks, almost all systems were functional (age of visited systems not specified). Interviews with community members and the document review26 confirmed high levels of service continuity and user satisfaction.

• The performance of private operators was generally found to be satisfactory and improving over time (functional system to collect and manage funds, quality of financial records, income being equal to or higher than the expenses, technical performance for maintenance and repair).27 However, as previously highlighted, issues with staff turnover, capabilities, record keeping and borehole quality and maintenance were observed.

• Water operators and audit reports indicate a billing rate in the region of 100% and revenue collection rates of between 75 and 100%. This shows that the policy requirement to increase fee collection based on consumption was met.

• Service providers met during the field visits and generally had spare parts in stock and some had standby supply contracts with suppliers for rapid spare parts provision. The 2014 sustainability check also found that “even in the districts, especially Burera and Nyabihu, which are geographically far away from the main cities, the operators are still capable of accessing the spare parts and making the repairs with the set standard (24 hours)”. However, small service providers did not always have chlorine in stock. Three of the four operators visited did not have chlorine and reported that they had not had chlorine for at least several days. This supply chain issue is a threat to water quality and health.

The overall programme score in sustainability checks increased from ‘average’ (i.e. 75%) in 2013 to ‘satisfactory’ (i.e. 86%, in 2014). Almost all scores are between 80 and 95% and have improved since the first sustainability check was carried out in 2011.

The functionality of gravity-fed systems and springs is very high because they have almost no maintenance requirements (aside from pipe breakages).

As opposed to piped network systems, UNICEF constructed boreholes and hand pumps relatively rapidly, and their sustainability outlook is very poor. The water quality is perceived to be poor, leading to very low perceived value being placed on these water points by the communities, private sector contractors in the area and the district authorities. Due to their perceived low value, communities are generally not paying for their usage or upkeep. District authorities do not have the experience or capacity to support communities and operators to maintain these water points, nor are there strong local supply chains for parts or services. There has been much less focus on identifying sustainable management arrangements for the water point sources (hand pumps and protected springs) compared to the piped water systems. This has led to the progressive abandonment of the boreholes, except by poorer households who cannot afford to pay for water.

E.4.3. Main sustainability issues

As described, the main sustainability issues are as follows:

- Boreholes and hand pumps (see issues described above).

- The delegation of non-functional schemes to private operators and the lack of ability/willingness of districts and their partners to rehabilitate them. This reduced the water operators’ consumer base and thus limited business profitability.

- Similarly, reports from private operators that pumping system tariffs are set too high and the bundling of schemes under a single PPP contract was not always appropriate, jeopardizing the business model. While efforts are currently underway to connect the pumping stations to electricity mains, consideration was not given earlier to using lower operation and maintenance cost solutions such as solar power.

- Results from monitoring data show that despite a higher demand for private connections, overall household water consumption is increasing very slowly, which does not support the financial viability of the business for water operators.

- Capacity building: Despite commendable investment in this area, training activities remained ad hoc and project-based, and the duration and quality of trainings was variable. Too few people from each invited organization were trained, and high staff turnover rates among water user committees, operators and district staff limited the long-term impacts. Operators and districts also mentioned the need to improve the selection and training of water sellers in order to increase their management skills and level of ownership.

- The supply chain for chlorine, water treatment practices by water operators and periodic water quality testing/monitoring. The 2010 Policy and Strategy and the World Bank study on PPPs conducted the same year emphasized this challenge very clearly. UNICEF and its partners did not adequately take up these issues during the period under review. The inclusion of water quality treatment and testing as part of the private operator’s responsibilities in PPP contracts, the provision of training and the recent collaboration with RURA have not yet led to notable improvements. Both 2011 and 2014 sustainability check reports indicate persistent issues with the presence of E.coli and with pH (high acidity) in
piped networks. Water quality was not tested at boreholes, but users perceived that borehole water quality was poorer than public tap water quality.²⁸

- Monitoring, reporting and regulation, which was also stressed as a key issue in the 2010 Policy (see section on innovation).

- Environmental issues: Although the piped water systems were generally of good quality, there were some issues (mostly falling under the responsibility of communities rather than contractors) that undermined environmental sustainability. Some spring catchments were not protected and drainage channels were not adequate or adequately maintained. In some areas, there were reports of frequent pipe damage due to farming activities, suggesting that pipes were laid at relatively shallow depths in some areas.

### E.4.4. Conclusion on sustainability

Sustainability became a strong priority for UNICEF RWS programming and on the advocacy agenda from 2009 onwards, following the launch of the DGIS programme. Evidence suggests that this was very much the result of strong demand by the donor, which was observable in: the general guidance provided by DGIS to UNICEF on sustainability in the proposal formulation phase; the request for mandatory annual sustainability checks; and a mandatory and very detailed chapter on sustainability in annual progress reports to DGIS (e.g. the 2011 report). As evidenced above, UNICEF responded effectively to this demand. Although there is room for further improvement, UNICEF made considerable efforts to ensure that the building blocks are in place for sustainable service delivery, especially for its supported piped schemes.

### E.5. Equity

UNICEF’s consideration for the population groups most in need in its geographical and beneficiary targeting, in programme design and implementation (both downstream and upstream) and in monitoring and evaluation

As per the design, the DGIS-funded programme set high expectations with regards to its use of an inclusive, equity-lensed and gender-sensitive approach. UNICEF annual country reports from 2009 to 2016 clearly reflect the attention paid to these aspects. The following sections investigate the extent to which, and how UNICEF Rwanda incorporated equity and gender considerations throughout the RWS programme cycle?

#### E.5.1. Situation analysis and geographical targeting

The UNICEF Rwanda country situation analysis and programme documents reviewed do not include a strong, RWS-specific identification/assessment of inequities for different geographical areas and vulnerable population groups.

In terms of geographical targeting, before 2009, UNICEF interventions were scattered and mainly guided by emergencies.

In the UNICEF/Government of Rwanda proposal to DGIS, the identified programme target area is described as follows: “This region is largely volcanic. It is an area of the country widely acknowledged as one in urgent need of development assistance, including for WASH. These problems have been exacerbated by war and continuing instability in neighbouring DRC [Democratic Republic of the Congo]”. The four districts were reportedly selected based on the

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²⁸ UNICEF sustainability check 2014
following criteria: the WASH coverage level; child mortality rates; the poverty rate; and the presence of other WASH initiatives (as per the 2008 donor mapping and distribution). The supporting data were not provided, however, and the process and analysis that led to the choice of the four districts was not explained.

A rapid analysis of household survey data (see Annex 5 maps) shows that while the Western Province indeed had the second lowest rate of improved drinking water supply coverage and accessibility within 15 minutes (one-way trip), the Northern Province had the second highest rate (data disaggregated by district not accessible). Regarding child mortality, two of the target districts (Nyabihu and Musanze) had the highest rates in the country, while the other two target districts had significantly lower rates. The poverty rate was low in three target districts, with Burera close to the national average. Overall, the south-western and far eastern districts seem to be the most disadvantaged. This analysis suggests either that not all four geographical targeting criteria were taken into account in the final decision or that the same weight was not given to all of them, given that when taken individually they did not lead to the same provinces and districts. It also suggests that other criteria were considered in the decision-making process.

The proposal to DGIS stresses that in the targeted districts, “due to a combination of genocide, war and refugees, many widows and orphans, as well as other groups of vulnerable people has been left behind […] The cost of water is much higher here than in other parts of the country – on average 20 litres of water costs between 20 and 40 Rwandan francs compare to 10 or less elsewhere […] Between May 2004 and May 2007 there have been at least six diarrhoea related disease upsurges in the region affecting many people.” Based on the 2012 national census data, the four districts were also the most densely populated in the country (excluding Kigali, the capital city). This is a significant asset for designing piped network systems and maximizing the number of beneficiaries. These parameters, together with the geographical distribution of WASH donors in the country, may have played a significant role in the choice of the districts.

This analysis indicates a disconnect between the geographical targeting strategy communicated by UNICEF and the actual selection of beneficiary districts. Equity concerns only partly guided the selection of the intervention districts. The analysis also points to the multidimensional nature of inequities and to the variety of criteria (all potentially relevant) guiding the geographical targeting strategy/process for RWS/WASH programming as well as for UNICEF country offices as a whole. Effectiveness and efficiency considerations have been factored in.

Within the four districts, the selection of individual communities for water schemes and boreholes was reportedly based on a process whereby communities requested support, and the district authorities appraised and selected them accordingly. It is unclear whether UNICEF influenced this process to ensure equity (and objectivity), for example based on a record of requests, a database and a list of eligibility and prioritization criteria. Again, it is likely that the heavily engineered design of piped water networks limited flexibility in the choice of beneficiary communities.

At the implementation stage, opting to promote a higher level of service through piped systems as per government policy and ambitions brings with it three challenges/disadvantages in terms of equity: participation, accessibility and affordability.

E.5.2. Accessibility and participation

The Government encourages scattered households and communities to relocate to ‘agglomeration points’ that will be served by the piped network and other basic services. However, there will always be remote populations that cannot access the service without considerable effort (e.g. people with disabilities and elderly people) or who will have to travel long distances to access more affordable sources. There is no evidence that the planning and siting of new/rehabilitated boreholes and springs was conceived by UNICEF as an intentional strategy to address/mitigate
the accessibility issue of public taps. The 2013 and 2014 sustainability checks showed lower accessibility scores for boreholes than for public taps.\(^{29}\)

Within target communities, inhabitants (including vulnerable households/people) were not involved in the intervention design and technology choice. However, those interviewed generally stated that they were consulted on the siting of the water points and asked to contribute to the capital investment through a financial or in-kind contribution. Water user committees were created or revitalized and trained. The first sustainability checks revealed limited effective participation, however, which, according to more recent sustainability checks and field interviews, improved after increased awareness raising efforts by districts and water operators. The 2014 sustainability check found that 90% of water point managers were women and were part of the user committee. As stated in the 2014 sustainability check “with the introduction of the private water operators, the role of the water point committees has been minimized”.

Water user committee members are represented in units and district water boards that were newly established by UNICEF and its partners under the DGIS-funded programme. These effectively give the communities, including the most vulnerable, a voice, particularly on service performance and tariff issues (see section on innovation).

Women, young people and people with disabilities were encouraged to become water vendors and join water user committees. These occupations have not only resulted in increased service coverage and service hours but have also improved the livelihoods of those managing the businesses.

### E.5.3. Affordability

Households are invited to switch from using less improved but generally free water sources (springs, boreholes or poorly managed piped networks) to paying for water from piped systems managed by private operators, which poses an affordability problem for the poorest. The 2010 Policy recommends that affordability be addressed by the choice of appropriate technologies, by enhancing efficiency and by granting targeted or cross-subsidies when necessary.

In the field, the bundling of various types of schemes (gravity-fed and pumping schemes and boreholes) within area-based PPP contracts allowed for cross-subsidies and enhanced commercial profitability from an operators’ perspective, which ultimately is also in the interest of consumers. The construction of a few boreholes also provided poor households with what ended up being an essentially free water source.

At the upstream level, UNICEF addressed the issue through the initiation of a sector-wide study and workshop on the water tariff system, which led to a tariff reform and harmonization across all piped systems and operators. This reform was applied nationally on 1 January 2017. However, the tariff system is not progressive – the unit price charged to consumers does not vary depending on the volume of water consumed or the wealth of the household. Indeed, the tariff structure is based only on the type of energy used by the system, with tariffs on diesel-powered systems being three times higher than those for gravity-fed systems, reflecting the former’s higher operation and maintenance costs. As a result, people living in the same district pay a different price for the same level of service, and the price is the same for all households served by a system.

In successive PPP contracts, UNICEF and its partner districts and SNV included a pro-poor clause. This clause was not very specific, which gave water operators substantial leeway. In the field, different measures have been applied at various times on the DGIS schemes visited. The early approach involved the operator providing a certain quantity of water for free to a certain

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\(^{29}\) 60% for boreholes vs. 83.5% for public taps (average for 2013 and 2014).
number of underprivileged households in the community. The DGIS proposal stipulated that: “Among others, such strategies will define rules/procedures/agreements on exemptions of the vulnerable groups from payments of the water tariffs. In the intervention areas, a rapid assessment has shown that this category of households makes up over 20% of the population, and mainly includes child-headed households, poor households headed by women, old or disabled people, and similar groups”. Various methods were used to identify the households. Districts were expected to finance the cost, as described earlier.

When the unconditional cash transfer component of the Vision 2020 Umurenge Programme was rolled out nationally in 2009, the application of the pro-poor clause evolved but remained inconsistent. Extremely poor households that were eligible for the cash transfer programme and selected through a community-led identification exercise received a card. In some districts/villages/operators, they were invited to show the card in order to collect water for free or at a discounted price. In others, the direct cash transfer was understood to financially cover their basic needs, and the water-specific subsidy was no longer required or continued.

Other limitations of this system are as follows:

- Inclusion/exclusion issue: There were debates within communities about households not receiving the cash transfer/subsidy when they should be eligible, and vice versa. This may explain reports of households not classified as extremely poor yet still collecting water for free.

- The same discount was not consistently applied, and the same amount of water was not consistently provided for free.

- Some community members interviewed stated that the number of beneficiaries of the subsidy decreased following the switch from the direct water subsidy to the cash transfer programme.

As a result, the audit reports of three water operators in Burera conducted by the district at the end of 2015 concluded that “the poor don’t get water”. While this may not be totally accurate, the sustainability checks underlined the same problem, and RURA confirmed that the contractual provisions need to be clarified and harmonized and their application streamlined in all districts. High tariffs may encourage the use of alternative unsafe sources of water supply by the poorest.

### E.5.4. Data disaggregation

UNICEF RWS programme monitoring indicators (since 2006) have not been disaggregated by gender or other population sub-groups/equity parameters. This prevents any equity-lensed analysis of the reach and effect of the programme and subsequent refinement of equity measures. It is a missed opportunity as the community-led household classification under the Vision 2020...
Umurenge Programme provides the necessary process and data, which are nationwide and officially recognized by the Government. Such a great opportunity is rare in sub-Saharan Africa. However, since the first sustainability check in 2011, all sustainability checks have included some consideration of equity issues, mainly regarding participation in water user committees and pro-poor tariffs/affordability. The latest check (conducted at the end of 2016 and not yet published at the time of writing) includes a full equity module, with data disaggregated by gender and sometimes by other categories of population as well as an equity scoring. According to this last sustainability check, it seems that equity has been placed high on UNICEF’s RWS agenda, particularly under the DGIS-funded programme. The strong requirements and incentives articulated by the donor at the programme onset and the renewed commitment on equity at the corporate level and in the country programme document may have played a role and supported effective uptake by the WASH section.

E.5.5. Conclusion on equity
UNICEF has taken steps to improve equity in the design and implementation of its RWS programming. However, equity remains an area of weakness due to the lack of adequate situation analysis; unclear approach to geographical targeting; sub-optimal levels of participation of women and vulnerable populations in the design, implementation and management of the service; high tariffs at pumping schemes; and lack of disaggregated indicators, data, analysis and reporting in the programme monitoring system. These weaknesses are partly but not entirely due to the heavily engineered and therefore top-down programming approach implied by the technology choice. Opportunities exist to improve on a number of aspects.

E.6. Innovation
UNICEF’s introduction of innovation and innovation scale up, in particular in the following areas: innovative financial mechanisms to support access to the service; private sector participation in the management of RWS; real-time monitoring; sector accountability; and regulation arrangements
The innovations presented below are not innovations in the WASH sector globally but initiatives within the Rwanda RWS sector. This means that, while it may not be a new idea in other parts of the world, it is a new idea as far as the Rwanda sector is concerned.

E.6.1. A model for RWS programming and services
UNICEF Rwanda was innovative during the DGIS-funded programme in terms of its piloting/refining of a comprehensive model for rural water supply programming and RWS service management.
The programme implementation model involved the following:

- Designing the programme in a highly participatory manner;
- Concentrating all interventions in a small number of districts;
- Moving away from implementation through NGOs;
- Building a tripartite partnership between UNICEF, the Government and districts and also involving WASAC;
• Setting up a coordination function at the central level to improve communication between the central government and UNICEF, as well as between the districts and UNICEF (which was already existing with slightly different arrangements before the DGIS-supported programme);

• Channelling funds directly to the districts;

• Recruiting and dedicating two WASH staff at the district level (these two positions were not funded by UNICEF but by WASAC, although they were fully dedicated to the DGIS-funded activities) and creating district WASH teams;

• Incorporating a strong capacity-building component for all stakeholders at the national, district, operator and community levels and on various topics;

• Combining water supply interventions (hardware), with hygiene and sanitation (software, directly linked with the Community Based Environmental Health Promotion Programme);

• Conducting periodic sustainability checks.

The innovative features of the RWS service management model were the following:

• Engaging strongly in piped schemes and PPPs: Though PPPs had been introduced in the early 2000s (not by UNICEF) and included in the 2004 sector policy, they had not been implemented with much success prior to the launch of the DGIS-funded programme in 2009;

• Streamlining the procurement process for private operators through revised and harmonized bidding documents and making their selection more competitive;

• Improving and harmonizing the PPP contracts (more details on each stakeholders’ accountabilities, performance standards for operators, royalties to the districts, etc.);

• Bundling different types of water schemes into area-based contracts;

• Developing cluster-based tariffs: This system was not included in the 2010 policy but was piloted during the DGIS WASH programme and supported the business model and financial viability of the service as well as equity;

• Introducing pro-poor arrangements in all PPP contracts;

• Developing/harmonizing guidelines for water user committees;

• Establishing/revitalizing sector and district water boards.

Various elements of these models are in the process of being replicated in other areas or mainstreamed into national approaches/guidelines/policies, including:

• The central programme coordination position, to provide support without undermining the decentralization process, was replicated in other sectors;

• The two district WASH staff (water and sanitation officer and hygiene and sanitation officer) were institutionalized in the latest 2016 policy. This model is to be replicated nationwide, transferring these two staff from WASAC to district payrolls, due to UNICEF advocacy to the Ministry of Infrastructure and the Ministry of Local Government;

• The contract bundling approach, which is currently being scaled up;
The tariff system, which RURA harmonized based on a study and UNICEF’s experience. Different tariffs were set up for each type of scheme and, after roll-out in 2017, will be revised to ensure they reflect effective costs and remain affordable for all.

The expansion of these models was made possible by the success of the programme; SNV’s expertise; the interest and engagement of districts, WASAC and RURA; and UNICEF’s demonstration and advocacy efforts, as well as its credibility and coordination role in the sector.

E.6.2. Monitoring, regulation and accountability to be improved

Three areas of interest for our evaluation in terms of innovation were not advanced by UNICEF during the evaluation period, despite the opportunities to do so: financial incentives for operators to expand the service; real-time monitoring; and accountability and regulation mechanisms.

Non-financial incentives have been promoted in the form of affermage contracts with longer durations. Other tools were not used, such as output-based aid for network development and household connections. Opportunities may emerge as the Rwanda economy grows and the banking and financial services sector develops.

The WhatsApp group endogenously set up in one district is a sign that the need exists and opportunities exist for using information and communication technologies to enhance service performance. In Rwanda, the penetration rate of smartphones and the utilization of apps such as WhatsApp are very high, as is the value placed on Internet access and real-time, transparent information systems.

UNICEF’s support to RURA is relatively recent and has focused on reviewing the water tariffs and strengthening capacities for water quality testing. UNICEF’s late engagement is possibly due to the fact that RURA’s role in RWS is also recent (late 2000s/early 2010s, with the development of PPPs), as is UNICEF’s support to PPPs. In addition, UNICEF generally does not have a strong history of and competence in engaging in water service regulation. While RURA is still in the process of defining RWS performance indicators, standard management and affermage contracts and refining tariffs, there is time to ensure that data is routinely collected by RURA and disaggregated and analysed for benchmarking purposes and to inform sustainability and equity measures. The existence of a dedicated team within RURA, and of professionalized operators in the field, is an asset. It is to be noted that RURA is not government funded and there is no fee added to the water tariff that could generate revenue that would facilitate partial self-financing.

The accountability loop (through the water committees and boards) involves users, service providers and districts, up to the district level. Current platforms and processes do not provide sufficient opportunities for user feedback to be passed up to the national regulatory agency. RURA’s role includes measuring user satisfaction, however.

E.6.3. Conclusion on innovation

UNICEF has been able to take opportunities offered by the decentralization process, strong government leadership and RWS policies, the availability of a growing private sector, and complementarities with SNV to develop/refine models for service delivery and management which have been proven successful. UNICEF used its positioning and credibility in the sector to expand several critical elements of these models beyond the scope of the DGIS-funded programme. There is room for further developments in the areas of financial incentives for operators to expand the service; real-time monitoring; and accountability and regulation mechanisms.
E.7. Overall conclusion

Overall, UNICEF has been able to capitalize on conducive policy, political, economic and sector environments. In 2009, the new DGIS funding generated a considerable budget increase, which created a challenge for UNICEF. UNICEF took up this challenge successfully. It was also able to use the new DGIS funding to revisit its RWS programme strategy and implementation approach in a relevant and participatory manner. Water quality, affordability, programme integration, monitoring, regulation and accountability are the main areas requiring further improvement. Nevertheless, UNICEF’s objectives were achieved through a relevant and generally effective combination of modelling, field implementation, capacity building and supervision, coupled with an upstream agenda to replicate/mainstream this model through advocacy and policy formulation. In addition, the Government has recently decided to double the budget allocated to the WASH sector and has committed to an ambitious sustainability agenda for rural water supply.

Moving forward, the RWS models from the DGIS programme, the strong partnerships and communication within the WASH sector and the current political conditions should all facilitate successful replication by UNICEF and other players nationwide. With these sector building blocks in place and given the evolution of the RWS sector in Rwanda, the country, with support from UNICEF and development partners, could be in a unique position to achieve the water supply-related SDG by 2030. These positive developments could be showcased throughout Africa, and the process, if documented, could be used as an example for other countries in which UNICEF works.
F. Recommendations

The Rwanda rural water supply sector and its enabling environment have evolved rapidly over the past 10 to 20 years. With more than 70% of the rural population now using improved water sources and the new Agenda for Sustainable Development, the objective of boosting the coverage rate will progressively be replaced with new objectives, such as improving the level of service in terms of the quantity, quality and distance to the home; improving the financial viability of the service; and reaching the remaining communities, while supporting households that are still using unimproved water sources – often the poorest, most remote and most vulnerable. The solutions to addressing these challenges are now largely available locally. Technology options, political will and skills are available in Rwanda more than in many other sub-Saharan countries. External financial and technical support will remain necessary however, and UNICEF will continue to have an important role to play in the sector.

UNICEF Rwanda is currently in the process of developing its new country programme document and strategy notes for the period 2018–2021. Discussions are ongoing with DGIS for the design of a new WASH programme in a number of countries, including Rwanda. The following recommendations for UNICEF are proposed with the hope that they can feed into these processes and support the implementation of the new sector policy. Several of the recommendations are already outlined in the 2016 rural water supply sustainability action plan. Although the recommendations are presented in a structured and logical way, they should be considered as a menu of options rather than a plan of action. The most appropriate options for UNICEF will depend on numerous factors, including the dynamic in the sector, the strategic vision of the UNICEF country office for its assistance to the country, the resources at its disposal and the positioning of other RWS donors and stakeholders.

F.1. Continue to support service upgrade and expansion...

1. In collaboration with other RWS stakeholders, advocate to the Government and/or directly support financial measures to incentivize water operators’ engagement in the business, enhance profitability and enable more private investment in service upgrade and extension. These measures should be in line with government policies and build on the experience of other sector stakeholders in Rwanda and of UNICEF in other countries.

They could include financial measures, for example:

- Providing upfront subsidies to private operators for network development/extensions;
- Setting up an output-based subsidy system for new household connections, with a premium for the connection of poor households;
- Subsidizing the cost of the connection of the power system of existing water schemes to the national electricity grid;
- Supporting the setup of a subsidy on the price of fuel/diesel purchased by operators to run water schemes;
- Easing access of private operators to concessionary or commercial loans and microfinance (e.g. through a formal agreement with finance institutions, the
establishment of bank guarantees and/or the provision of training and technical assistance to operators).

And non-financial measures:

- Consider using solar power in the future to replace expensive diesel pump systems to reduce costs;
- Through information campaigns and procurement processes, encourage new operators to enter the market and/or existing operators to extend their networks and take over new schemes. The most adequate strategy should be determined based on a comparison of the advantages and disadvantages of each option within the context of Rwanda;\(^{32}\)
- When the context permits, continue to promote longer management contracts, as well as the use of affermage arrangements, with appropriate risk allocation, performance targets, review/revision mechanisms, incentives and sanctions;
- Institutionalize the periodic training/refreshing of water operators’ staff and progressively include new training topics. As a priority, strengthen the capacity of service providers’ water quality testing and treatment, service management and performance monitoring/reporting. There may be potential to integrate such capacity building into permanent sector institutions, training centres or federations and university curriculum as well as to identify corresponding potential financing arrangements in order to build the foundations for long-term professionalized staff and capacity-building support. Coaching/peer-support options between operators could also be explored;
- Encourage collaboration between local domestic firms and more experienced regional/international firms (as in the case of Aquavirunga);
- Intensify sensitization campaigns targeting consumers to boost the demand for household connections, increase water consumption levels, maintain the high fee collection rate and reduce vandalism of the infrastructure.

F.2. …Without leaving the most vulnerable behind

Further incorporate equity considerations at all stages of the programme cycle, as the poor are most at risk of being left behind with the expansion of piped networks and the shift to profit-oriented management models.

2. Define vulnerable/priority geographical areas and population groups and determine a resulting targeting strategy and process, in collaboration with other UNICEF sections, RWS donors and the Government. Equity, effectiveness and efficiency criteria should be acknowledged as part of this strategy/process, with potential trade-offs between them.

3. Continue to advocate to RURA and the Government for the better inclusion of equity considerations in the upcoming review of the water tariff structure based on the result of

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\(^{32}\) Sector concentration has several advantages. Existing operators have more experience and some are willing to continue to invest. They would be able to achieve economies of scale, cross-subsidize across systems, and further invest in service expansion. It is easier to monitor and regulate a reasonable number of operators, and it would send the message that water is a profitable business. Encouraging competition among service providers also has advantages. It would support the drive for service performance, and reduce risks associated with oligopolies, including tariff increase, collusion with local governments, etc.
the latest sustainability check or a more specific pricing/affordability study modelling various arrangements and scenarios. Advocacy messages could focus on the following priorities:

- Harmonizing tariffs across different types of systems (gravity-fed, pumping, etc.) and districts for more equality between similar users benefiting from the same level of service;
- Ensuring that each operator has a mix of systems to enable a reasonable level of profitability;
- Ensuring cross subsidy between the richest and poorest consumers by varying the tariff, which could be based, for example, on consumption, household classification under the Vision 2020 Umurenge Programme/poverty classification, etc.;
- Clarifying and streamlining the tariff and subsidy systems accordingly in PPP contracts and in district and operators’ training.

4. Support the protection and development of springs as an interim measure for agglomeration points awaiting the installation of piped systems or for more remote and poorer communities and households. This approach was discontinued under DGIS. Alternatively, UNICEF could look into the broader community-level water safety planning approach that is being piloted by UNICEF and WHO, notably in the East Asia and the Pacific region, and/or support the enabling environment for household self-investment.

5. Set up an equity-focused RWS programme monitoring, evaluation and reporting system. More precisely, formulate programme monitoring indicators ensuring disaggregation by gender and other population sub-groups/equity parameters, for example by household classification under the Vision 2020 Umurenge Programme; collect corresponding data, analyse and report on them; conduct studies and evaluation to assess programme reach and outcomes; and refine equity measures accordingly.

F.3. Support service sustainability with improved regulation and accountability arrangements

Balance the engineered, top-down and privately-managed/profit-oriented RWS models through enhanced regulation and bottom-up accountability mechanisms.

6. Continue to support the sector, particularly RURA, in their plans to:

- Refine tariffs (as described above);
- Establish standard management and affermage contracts;
- Systematically define and populate RWS key performance indicators (indicators to be aligned with sector best practices and SDG reporting requirements); and harmonize and strengthen the reporting indicators, template and procedures to be used by water operators to report to districts, WASAC and RURA, accordingly;
- Monitor water quality;
- Use collected data for benchmarking purposes, sustainability and equity analysis, and developing capacity-building plans/activities;
• Institutionalize and embed aspects of the sustainability check approach into regular sector monitoring by districts and RURA to ensure timely support to service providers and appropriate course correction.

7. **Support additional mechanisms for users to voice their demands and for responsible entities (i.e. districts, operators and WASAC) to receive timely information about user experience and service quality. Close the accountability loop by enabling user feedback to be passed up to RURA.**

• Support the creation of WhatsApp groups, smartphone-based real-time monitoring technologies or other appropriate information and communication technologies in all districts to enhance service performance monitoring and accountability of water operators to districts, RURA and users.

• Support the setup of a communication platform between the national federation of private operators (which already exists) and a similar national federation of water user committees (which could be created). Such a mechanism would allow the civil society and district water boards to hold service providers to account based on the PPP contract provisions, RWS service key performance indicators and service standards. Other possible arrangements are described in the UNICEF global guide, ‘Accountability for Sustainability: Reference Guide for WASH Programming’ and accompanying tools published in 2015–2016.

### F.4. Strengthen synergies with other WASH and non-WASH interventions

8. **Strengthen the sanitation and hygiene programme component and its interlinkages with the RWS interventions.** In particular:

• Consider moving away from the PHAST method and adopt community mobilization and sensitization methods more closely based on *Ubudehe* or adapted from the Community-Led Total Sanitation approach, which proved successful in other eastern and southern African countries;

• Reinforce integration with water infrastructure construction activities and with the activities/responsibilities of the water operators.

9. **Continue to strengthen synergies with other sectors/sections within and outside UNICEF, notably health, nutrition, education, protection and Communication for Development.** These efforts should be guided by a clear country office vision and strategy. Note that integrated programming goes beyond geographical convergence in the same districts or localities. Achieving holistic results for children and their families usually implies joint donor proposals and programme planning; an integrated theory of change and result framework; not only an integrated package, but also a well-thought sequencing of activities in the field; joint implementation partnerships; common monitoring and evaluation frameworks and data collection processes; joint coordination in the field and within UNICEF; harmonized reporting arrangements; and an evaluation and learning component to validate or adjust the approach. A few past (Uganda) and ongoing (Guinea) experiences could inspire UNICEF Rwanda in this regard.
G. Annexes

G.1. Country visit timeline

9–13 January 2017: Week one (field visit):
- Traveled to four districts (Burera, Musanze, Nyabihu and Rubavu)
- Interviews conducted with:
  - District mayors/private operators
  - Water venders
  - Community leaders
  - Communities

16–20 January 2017: Week two (sector-level interviews):
- Interviews conducted in Kigali with:
  - Ministries (Ministry of Health, Ministry of Infrastructure, and Ministry of Environment)
  - Development partners: African Development Bank, Japan International Cooperation Agency and the World Bank Water and Sanitation Programme (WSP)
  - Regulator (RURA)
  - Implementing partners (WASAC, SNV)
  - UNICEF staff
  - Former UNICEF staff and experts

G.2. List of semi-structured interviews and workshop participants

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<thead>
<tr>
<th>#</th>
<th>Name and designation</th>
<th>Organization</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Lambert Karangwa, WASH Projects Coordinator</td>
<td>WASAC</td>
</tr>
<tr>
<td>2.</td>
<td>James Sano, CEO</td>
<td>WASAC</td>
</tr>
<tr>
<td>3.</td>
<td>Marie José MUKANYAMWASA, Director of Rural Water</td>
<td>WASAC</td>
</tr>
<tr>
<td>4.</td>
<td>Aime Muzola, Acting Director General of Planning</td>
<td>Ministry of Infrastructure</td>
</tr>
<tr>
<td>5.</td>
<td>Marcelline Kayïtesi, Acting Division Manager, WatSan</td>
<td>Ministry of Infrastructure</td>
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<tr>
<td>6.</td>
<td>Fidele NTEZIYAREMYE, WatSan Secretariat Coordinator</td>
<td>Ministry of Infrastructure</td>
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<td>7.</td>
<td>Ephrem Rutaboba, Water and Sanitation Specialist</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>8.</td>
<td>Aya Kagota, WASH Sector Lead</td>
<td>Japan International Cooperation Agency</td>
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<td>9.</td>
<td>Jacques Nzitonda, Director of Water and Sanitation</td>
<td>RURA</td>
</tr>
<tr>
<td>10.</td>
<td>Phocus Ntayonbwa</td>
<td>Former UNICEF staff</td>
</tr>
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<td>Organization</td>
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<tr>
<td>11</td>
<td>Joseph Usabimana, Executive Director</td>
<td>Aquavirunga</td>
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<td>12</td>
<td>Bruno Mwanafunzi</td>
<td>Former staff of the World Bank / Ministry of Infrastructure</td>
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<tr>
<td>13</td>
<td>Richard Nyirishema</td>
<td>SNV</td>
</tr>
<tr>
<td>14</td>
<td>Monique Zwiers, WASH Sector Team Leader</td>
<td>SNV</td>
</tr>
<tr>
<td>15</td>
<td>Kabalisa Vincent de Paul, Head of IWRM Department</td>
<td>Ministry of Natural Resources</td>
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<td>16</td>
<td>Simon Ndutiye</td>
<td>Former staff of Ministry of Infrastructure</td>
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<td>17</td>
<td>Maurice Kwizera, Country Manager</td>
<td>WaterAid</td>
</tr>
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<td>18</td>
<td>Perpetue Kamuyumbu Country Director</td>
<td>Water for People</td>
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<tr>
<td>19</td>
<td>NDABEREYE Augustine Vice Mayor</td>
<td>Musanze District</td>
</tr>
<tr>
<td>20</td>
<td>MUKANSANGA Clarisse Vice Mayor</td>
<td>Nyabihu District</td>
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<tr>
<td>21</td>
<td>UWANZWENUWE Théoneste Mayor</td>
<td>Nyabihu District</td>
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<tr>
<td>22</td>
<td>Alphonse Marango WASH Engineer</td>
<td>Nyabihu District</td>
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<tr>
<td>23</td>
<td>Evase Ntaganira WASH Officer</td>
<td>Nyabihu District</td>
</tr>
<tr>
<td>24</td>
<td>Murenzi Janvier Vice Mayor</td>
<td>Rubavu District</td>
</tr>
<tr>
<td>25</td>
<td>UWAMBAJEMARIYA Florence Mayor</td>
<td>Burera District</td>
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<tr>
<td>26</td>
<td>HABYALIMANA Jean Baptiste, Vice Mayor</td>
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<tr>
<td>27</td>
<td>GITEGO Jeanne Clementine</td>
<td>Burera District</td>
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<td>28</td>
<td>Nkezabera Come Social Mobilizer</td>
<td>Burera District</td>
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<td>29</td>
<td>Emmanuek Hategeka</td>
<td>Ministry of Infrastructure</td>
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<td>30</td>
<td>Bahame Hassan Former Mayor</td>
<td>Former Mayor, Rubavu</td>
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<tr>
<td>31</td>
<td>Sembagare Samuel Former Mayor</td>
<td>Former Mayor, Burera</td>
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<td>32</td>
<td>Murtaza Malik WASH Manager</td>
<td>UNICEF</td>
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<td>33</td>
<td>Mahrajan Muthu Chief Child Survival and Development</td>
<td>UNICEF</td>
</tr>
<tr>
<td>34</td>
<td>Oliver Peteovic Deputy Representative</td>
<td>UNICEF</td>
</tr>
<tr>
<td>35</td>
<td>Yumi Matsuda Chief Planning, Monitoring and Evaluation</td>
<td>UNICEF</td>
</tr>
</tbody>
</table>
# Name and designation | Organization
--- | ---
36. Jean Marie Rutaganda | UNICEF
   WASH Specialist
37. Gedeon Musabyimana | UNICEF
   WASH Officer
38. Nidhi Joshi, Donor relations | UNICEF
39. Zeinep Baimetova, DIC Representative | UNICEF
40. Sara Mcginty, Chief Education | UNICEF
41. Mukamunana Alphonsine | Ministry of Health
42. Joseph Katabarwa | Former Head of EHD/Africa-AHEAD
43. Clement Ndungutse, Water Supply Monitoring Officer | RURA
44. Representative-officer in charge | UNICEF
45. Deputy Representative-officer in charge; and Maharajan Muthu, Chief of Child Survival and Development / Health and Nutrition | UNICEF
46. Chief of Early Childhood Development | UNICEF
47. Chief of Education | UNICEF
48. Erna Ribar, Chief of Social Policy | UNICEF
49. Yumi Matsuda, Chief of Planning, Monitoring and Evaluation | UNICEF

G.3. List of sites visited during the field work

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<thead>
<tr>
<th>District</th>
<th>Community</th>
<th>System</th>
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<td>Rubavu</td>
<td>Rukondo</td>
<td>Hand pump</td>
</tr>
<tr>
<td>Nyabihu</td>
<td>Cyamabuye-Munkali</td>
<td>Pumped piped</td>
</tr>
<tr>
<td></td>
<td>Rugarama</td>
<td>Protected spring</td>
</tr>
<tr>
<td></td>
<td>Gatovu-Kanyembayi</td>
<td>Pumped piped</td>
</tr>
<tr>
<td></td>
<td>Nyabihu Gatouu</td>
<td>Pumped piped</td>
</tr>
<tr>
<td>Musanze</td>
<td>Munindi</td>
<td>Protected spring</td>
</tr>
<tr>
<td></td>
<td>Munindi</td>
<td>Gravity piped</td>
</tr>
<tr>
<td></td>
<td>Mukungwa</td>
<td>Hand pump</td>
</tr>
<tr>
<td></td>
<td>Gacaca sector, Rurambo</td>
<td>Pumped piped</td>
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<tr>
<td>Burera</td>
<td>Mugera-Rwerere</td>
<td>Pumped piped</td>
</tr>
</tbody>
</table>

G.4. List of documents reviewed

- Districts of Burera, Nyabihu, Rubavu, and Musanze (date unspecified): samples of PPP contracts and water private operators audit reports
• Government of Rwanda (2008): A Situation Analysis of Orphans and Other Vulnerable Children in Rwanda
• NISR (2012): Rwanda Demographic and Health Survey 2010, Final Report
• NISR (2012): Enquête Intégrale sur les Conditions de Vie des Ménages (EICV3) Thematic Report (Utilities and Amenities)
• SNV (2011): Training Workshop on Financial Management, Supply and Procurement in the Volcanic Region
• SNV (2011): Capacity Development of Districts in WASH for the Volcanic Region, final report
• SNV (2011): Training on Human Right Based Approach to Programming
• SNV (2013): Public Private Partnerships in rural water and sanitation
• UNDP (2016): Africa Human Development Report


UNICEF Rwanda (2008): Donor Proposal to the DGIS/Royal Embassy of the Netherlands


UNICEF Rwanda (2016): Assessment of Sustainability of Rural Water, Sanitation and Hygiene Interventions in Rwanda

UNICEF Rwanda (multiple years): diverse donor proposals

UNICEF Rwanda (2011): Annual donor report to DGIS


World Bank / Water and Sanitation program and GoR Ministère des Infrastructures (2009): Les performances du PPP pour la gestion des adductions d'eau rurales au Rwanda

G.5. Analysis of province and district level drinking water supply coverage, child mortality and poverty

Figure 4: Percentage of households using improved water source by province in 2005/06 and 2010/11

<table>
<thead>
<tr>
<th>Province</th>
<th>Total improved water source</th>
<th>Total pop. (000s)</th>
<th>Total improved water source</th>
<th>Total pop.(000s)</th>
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<tr>
<td>All Rwanda</td>
<td>74.7</td>
<td>10,762</td>
<td>70.7</td>
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<td>Kigali City</td>
<td>84.3</td>
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<td>86.0</td>
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<tr>
<td>Southern Province</td>
<td>74.4</td>
<td>2,527</td>
<td>74.0</td>
<td>2,420</td>
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<td>Western Province</td>
<td>75.1</td>
<td>2,596</td>
<td>68.7</td>
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<td>Northern Province</td>
<td>79.6</td>
<td>1,981</td>
<td>76.3</td>
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<td>Eastern Province</td>
<td>66.8</td>
<td>2,609</td>
<td>57.8</td>
<td>2,120</td>
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<tr>
<td>Urban</td>
<td>87.8</td>
<td>1,595</td>
<td>85.1</td>
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<td>Rural</td>
<td>72.4</td>
<td>9,167</td>
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<td>Q1</td>
<td>68.6</td>
<td>2,123</td>
<td>66.3</td>
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<tr>
<td>Q2</td>
<td>72.1</td>
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<td>Q4</td>
<td>73.6</td>
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<td>No disability</td>
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<td>10,284</td>
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<td>9,137</td>
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<tr>
<td>With disability</td>
<td>72.7</td>
<td>479</td>
<td>67.0</td>
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Source: National Institute of Statistics of Rwanda, Integrated household living conditions surveys 2 and 3 and Integrated household living conditions survey 3 thematic report (utilities and amenities), 2012.
Figure 5: Percentage of households within 15 minutes of an improved water source by province in 2005/06 and 2010/11

Source: National Institute of Statistics of Rwanda, Integrated household living conditions surveys 2 and 3.

Figure 6: Child mortality rate by province in 2009/10

Figure 7: Percentage of poor (first graph) and extreme poor (second graph) households by province in 2009/10, 2006/07 and 2010/11

Source: National Institute of Statistics of Rwanda, Integrated household living conditions surveys 1, 2 and 3.
Figure 8: Poverty rate by district in 2010/11

Figure 9: Extreme poverty rate by district in 2013/14

Figure 10: Physical (map) and physiological (table) population density by district in 2012\textsuperscript{33}

Contrary to the physical population density, the physiological population density considers the land surface area only (excluding inland waters).
<table>
<thead>
<tr>
<th>Province and District</th>
<th>Population</th>
<th>Physiological density</th>
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<tr>
<td>Rwanda</td>
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<td>Nyamagabe</td>
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