Report No: AUS11483

SIASAR

Latin America

Consolidation, Improvement and Expansion of the Rural Water and Sanitation Information System (SIASAR)

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Joint output report for the Technical Assistance (TA) activities — “SIASAR Consolidation and Expansion in LAC” (P148645) and “6L Rural WSS Information System (SIASAR)” (P153736)

June 9, 2017

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LATIN AMERICA AND CARIBBEAN

WORLD BANK GROUP
Water

Acknowledgements

This joint output report summarizes the results of the World Bank's Water Global Practice support to members for the consolidation, improvement and expansion of SIASAR as a decision support tool for policy formulation, planning, and resource allocation, ultimately, aiming to enhance the sustainability and quality of services in the rural water supply and sanitation sector in Latin America and the Caribbean.

The World Bank team would like to express its gratitude to the Governments of the 11 members (Honduras, Nicaragua, Panama, the Dominican Republic, Costa Rica, the Mexican State of Oaxaca, the Brazilian State of Ceará, Bolivia, Peru, Colombia, and Paraguay) for their collaboration. The SIASAR initiative is the result of a concerted effort conducted by all members with financial and technical support from the World Bank and contributions from strategic partners, such as the Swiss Agency for Development and Cooperation (SDC), the Spanish Ministry of Economy and Competitiveness (MEC), the Spanish Agency for International Development Cooperation (AECID), the Inter-American Development Bank (IDB), the European Union (EU), the United Nations Children's Fund (UNICEF), international NGOs, regional networks, and local organizations.

This report was prepared by a World Bank team, led by Antonio Rodriguez Serrano, Senior Water and Sanitation Specialist (Task Team Leader and Lead Author), comprising: Crystal Fenwick, Water and Sanitation Consultant; David Sobel, Consultant; Gonzalo Martinez Crespo, SIASAR Coordination Consultant; Marta Fernandez Gonzalez, SIASAR IT Coordination Consultant and with the support of Christian Borja-Vega, Economist. The SIASAR IT 2.0 platform was developed by members with support by an IT consultant team, led by Marta Fernandez, comprising: Eva Reguera, Project Management; Ignacio Segura, CMS Specialist; Jamal Toutouh, IT Architect; Mauricio Miranda, GIS Specialist; and Martin Dell Oro, Web Developer. The Engineering Science and Global Development (EScGD) group of the Polytechnic University of Catalonia (UPC), led by Agustí Perez-Foguet and integrated by Ricard Giné Garriga, and David Requejo Castro, with the support of Alejandro Jimenez (SIWI), played a pivotal role in providing technical expertise to support members in the review and improvement of the SIASAR conceptual model and to assess its alignment and contribution to monitoring the Sustainable Development Goals for water and sanitation.

The team would also like to thank the following people for their respective contributions and support to the SIASAR initiative: Blanca Lopez Alascio, Carmen Molejon, Charles Delfieux, Christophe Prevost, Clementine Stip, Fernando Laca, Gustavo Perochena, Juliana Garrido, Lilian Pena, Luis Alfonso Alvestegui, Marco Antonio Aguero, Maria Angelica Sotomayor, Miguel Vargas-Ramirez, Mirtha Murillo, Nelson Medina, Sabrina Zimmerman, and Sophie Ayling.

The report was reviewed by Alexander Danilenko, Senior Water and Sanitation Specialist; Kristoffer Welsien, Water Supply and Sanitation Specialist; Luis Alberto Andres, Lead Economist; and Miguel Campo Llopis, Spanish Water and Sanitation Fund Coordinator at the Inter-American Development Bank.

The team gratefully acknowledges the support of the Global Solution Group on Rural Water and Sanitation, led by Miguel Vargas-Ramirez, Sr. Water and Sanitation Specialist, and the overall guidance and approval provided by David Michaud, Practice Manager for Europe, Central America and Haiti, Water Global Practice, The World Bank.

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Abbreviations and Acronyms

AECID	*Agencia Española de Cooperación Internacional para el Desarrollo* (Spanish Agency for International Development Cooperation)
ARAS	*Asesores Regionales de Agua y Saneamiento* (Regional Water and Sanitation Advisors)
CAPS	*Comité de Agua Potable y Saneamiento* (Potable Water and Sanitation Committee)
CBO	Community-based Organization
CMS	Content Management System
DLI	Disbursement-Linked Indicator
FISE	*Fondo de Inversion Social Para Emergencias* (Social Investment Fund for Emergencies)
FOCARD-APS	*Foro Centroamericano y Republic Dominica de Agua Potable y Saneamiento* (Central American and Dominican Republic Forum for Potable Water and Sanitation)
HTML	Hypertext Markup Language
ICT	Information and Communications Technology
IDB	Inter-American Development Bank
INAPA	*Instituto Nacional de Agua Potable y Alcantarillado* (National Institute for Potable Water and Sewerage)
LAC	Latin America and the Caribbean
MOU	Memorandum of Understanding
MINSA	*Ministerio de Salud* (Ministry of Health)
NGO	Non-Governmental Organization
PforR	Program-for-Results Financing
PHP	Hypertext Preprocessor
RWSN	Rural Water Supply Network
SFLAC	Spanish Fund for Latin America and the Caribbean
SANAA	*Servicio Autonomo Nacional de Acueductos y Alcantarillados (*National Autonomous Water and Sewerage Service)

SDC	Swiss Agency for Development and Cooperation
SDGs	Sustainable Development Goals
SIASAR	*Sistema de Información de Agua y Saneamiento Rural* (Rural Water and Sanitation Information System)
TA	Technical Assistance
QA/QC	Quality Assurance and Quality Control
UEAR	*Unidad Ejectuora de Acueductos Rurales* (Executing Unit for Rural Aqueducts)
UMAS	*Unidad Municipal de Agua y Saneamiento* (Municipal Water and Sanitation Unit)
UNICEF	United Nations Children's Fund
UPC	*Universitat Politècnica de Catalunya* (Polytechnic University of Catalonia)
WGP	Water Global Practice
WPP	Water Partnership Program
WSP	Water and Sanitation Program
WSS	Water Supply and Sanitation

EXECUTIVE SUMMARY

A. Introduction

The Sustainable Development Goals (SDGs) emphasize service delivery, which requires an innovative approach to evidence-based policy-making. However, service providers in rural areas often lack the technical capacity needed to effectively deliver reliable services while a lack of up-to-date and comprehensive data means little information is available for policy makers, planners and sector specialists to identify and respond to the needs of rural communities. An improved information management system that reflects local realities can help address these challenges.

In this context, the governments of Panama and Nicaragua, followed shortly by Honduras, articulated the need for an enhanced information system to help prioritize technical assistance and improve the sustainability of service providers in rural areas. In response, the World Bank consolidated resources from several ongoing operations in the region, the Water Partnership Program (WPP) and the Water and Sanitation Program (WSP), and the Rural Water and Sanitation Information System (SIASAR) was born. Officially launched in 2011, SIASAR is an innovative information management and decision support system with a strong focus on sustainability that aims to support a comprehensive management approach to rural WSS service delivery. SIASAR addresses the challenges faced by the sector and promotes the long-term sustainability of rural WSS services by responding to the general lack of up-to-date information, generating important information, evaluating the performance of service providers, and improving the overall effectiveness of technical assistance. Following a successful pilot program in 2012, efforts began to focus on improving the system and formalizing the institutional and operational arrangements to consolidate and expand its use in Latin American and the Caribbean and in 2013 the World Bank began providing dedicated non-lending technical assistance (TA) under the "SIASAR Consolidation and Expansion in LAC" TA (P148645) supported by the WSP through trust funds TF093845 and TF0A3271 and the "6L Rural WSS Information System (SIASAR)" TA (P153736) supported by the Spanish Fund for Latin America and the Caribbean (SFLAC) TF016023. This report presents a consolidated review of both TAs through a detailed discussion of the achievements and results of the SIASAR initiative.

B. Development Objective

The primary development objective of the TA was to support the consolidation and expansion of SIASAR as a decision support tool for policy formulation, planning, and resource allocation, ultimately aiming to enhance the sustainability and quality of services in the rural water supply and sanitation sector in Latin America and the Caribbean. The success of SIASAR exceeded expectations and most of the intermediate outcomes were achieved or surpassed. Specifically, the TA positively impacted the institutional strength of diverse institutions and sector agencies in the region, supported the expansion of SIASAR to 11 members (Panama, Honduras, Nicaragua, the Dominican Republic, Costa Rica, Mexico (Oaxaca), Brazil (Ceará), Bolivia, Peru, Paraguay, and Colombia), increased capacity in the sector, influenced policy planning and decision-making at the national and subnational level, promoted the rural water supply and sanitation sector, cultivated knowledge transfer, and supported ongoing improvements designed to enhance the SIASAR initiative and tools.

C. Description of SIASAR and Methodological Approach

Critical to SIASAR's success was the unique collaborative and participatory process driven by, and tailored to, the needs of each member drawing on existing experiences, and facilitated through regular interactions. Underpinning this process has been the initiative's strong commitment to the eight Guiding Principles crafted to ensure the long-term, practical use of information: Simple, Robust, Institutionalized, Open, Harmonized, Adapted, Flexible, and Current. This approach cultivated strong ownership and

stimulated learning opportunities and ties between members, helping to cement SIASAR's integration into the rural WSS sector in LAC while raising awareness of the sector and importance of sustainability overall. Governed by a member-led structure espoused in a set of Official Regulations, SIASAR's institutional framework actively engaged senior officials from national and subnational governments. This high level of commitment was essential to ensuring SIASAR was institutionalized within individual sector frameworks and policies, anchoring the SIASAR initiative and paving the way for the implementation process. The TA supported the initiative through a two-pronged approach: institutional and operational. The Bank's convening power successfully leveraged significant interest at a high level leading to the adoption of SIASAR by national sector authorities, however, because of the rapid expansion of SIASAR the TA was unable to sustain the same level of intensity of institutional support, which may have affected SIASAR's implementation at lower levels of government. Nonetheless, the TA provided significant financial and technical support during the operational phase, with a strong emphasis on bridging the gap in member capacity to manage the day-to-day operations of SIASAR. In particular, the TA supported the development of a new conceptual model and information system (SIASAR 2.0, launched in April 2017) expanding and refining the methodology that underpins SIASAR's data analytics leading to better, more stable and more reliable outcomes.

To address sustainability, the conceptual model was conceived as a metric designed to assess the functionality of water supply and sanitation services over time. Specifically, the conceptual model aims to provide a detailed perspective of different aspects concerning water and sanitation services and defines methodologies to aggregate the information into thematic indices. A battery of 60 indicators, classified into 24 components and grouped into six dimensions (water service level, sanitation and hygiene service level, water system infrastructure, service provision, technical assistance provision, and schools and health centers) are aggregated into two sub-indices: the Water, Sanitation and Hygiene Service Level Index (WSH) and the Water Services Sustainability Index (WSS) aggregated in turn to give rise to the final Water and Sanitation Performance Index (WSP). To assess the functionality of water supply and sanitation services over time field data are collected (and updated) using four basic questionnaires that analyze the level of service from the perspective of four core entities: community, service provider, systems and technical assistance. All indices, indicators and data collected in the field must feed into the sustainability metric, which uses ratings (ranging from a high of A to a low of D) or classifications to express functionality. This classification scheme is based on the premise that sustainability will decrease i.e. descend from A to D, if a service does not receive the necessary attention and care required to maintain optimal functionality. Finally, the information ecosystem supporting SIASAR was developed with the goal of creating a suite of free, open source, simple yet robust, modern ICT tools. Drawing on technological and historical experiences across the membership base, SIASAR comprises four primary components: SIASAR Website (Content Management System, backend and public website); SIASApp (multi-platform mobile applications); SIASAR Business Information (data integration and business analytics) and SIASAR Geo Dashboard (Geographic Information System (GIS)) described in detail in Chapter 3.

D. Summary of Results and Bank Performance

As of June 2017, data from more than 23,500 rural communities, representing more than 11,000,000 people have been collected, validated and input into SIASAR making an often-invisible sector visible and generating important findings to inform strategic policies and streamline technical assistance. The initiative expanded from three to 11 members in four years: 198 institutions support the implementation of SIASAR, accompanied by rigorous institutional strengthening and capacity building campaigns and more than 102 initiatives and activities have been informed. Analyzing data from the universe of communities registered in SIASAR offers additional insights into the reality of rural WSS that complement existing coverage data. Importantly, data gathered using SIASAR offer an enhanced picture of the sustainability of rural services, notably only 8 percent of all communities and 7 percent of service providers have achieved a classification of "A" e.g. optimal service levels. Systems fare slightly better although most are in need of some type of repair corresponding to a startling, yet understandably, low level of technical assistance. Further analyses give rise to interesting preliminary results suggesting a potential

relationship between gender and service quality and the TA supported a rigorous research agenda (results forthcoming) that aims to evaluate the robustness, reliability and applicability of SIASAR further.

As indicated, the TA achieved and exceeded expected outcomes. Correspondingly, the Bank's performance and efficiency in implementing the TA has been effective. The TA supported the institutional strengthening of national and regional institutions, successfully consolidating and promoting the use of SIASAR in policy planning and decision-making and fostering greater capacity among the initiative's members. Indeed, SIASAR's rapid expansion is a testament to its strategic relevance and the Bank's convening power, which was essential to leveraging strategic partnerships, attracting expertise and creating brand awareness regionally and globally. Several strategic, long-standing partners such as the IDB, AECID, SDC and UNICEF in addition to Non-Governmental Organizations (NGOs) have supported the initiative, and have been equally important to its success. Notably, members have been empowered to gradually take leadership roles, further increasing the strong ownership cultivated through the participatory approach, however, the SIASAR initiative continues to rely on the TA's support. The Bank's influence has proven to be a positive resource in generating political will at the national level, however, the TA's limited reach at the subnational level where SIASAR's implementation in practice has been somewhat less stellar is an unintended effect of the top-down approach to generating institutional support. Furthermore, there are currently no accountability mechanisms in place to ensure members meet commitments prescribed in the Regulations potentially affecting the long-term sustainability of SIASAR and the implementation process has been met with variable success.

E. Lessons Learned and Recommendations

The rapid expansion of SIASAR from three to 11 members in four years has led to an abundance of lessons learned, which can be summarized into four broad themes: data collection, understanding results, value for money, and understanding sector realities. Many of these are linked to specific recommendations designed to improve the initiative, the information ecosystem or the implementation process moving forward.

For example, SIASAR's autonomous approach to data collection gave rise to a novel approach in Peru – where national government fiscal transfers were linked to the collection and reporting of data for use in SIASAR – that could be replicated and expanded elsewhere. Additionally, whereas the initiative initially envisaged completing full national baselines – an approach that was highly successful in Nicaragua – perceptions have evolved to support and value the application of SIASAR at different scales. Indeed, the ability to operate across geographical scales has proven to be one of SIASAR's strengths. The addition of new members with existing databases has demonstrated SIASAR's strength as a frontend (data analytics and reporting) tool highlighting potential opportunities to collaborate with existing tools that focus on providing backend (data collection) solutions. Finally, the inclusion of new members has reinforced the need for indicators to remain harmonized to ensure the continued accuracy and ongoing relevance of inter-country comparisons.

While the application of SIASAR in practice has been met with reasonable success, sustainability in the rural WSS sector remains a relatively new concept and limited capacities preclude members from capitalizing on SIASAR's full potential. Moving forward, technical assistance should support the increased uptake of SIASAR as a decision support system and its application to activities within and beyond the sector by generating and analyzing reports to better understand the factors that affect the sustainability of services.

With a broad and disparate membership base, SIASAR has had to identify and promote novel approaches to collaborating and working across space and time. Virtual workspaces have paved the way for seamless transitions while video conferencing has enabled teams to maintain regular contact while both initiatives have helped keep operational costs low. Notwithstanding, certain face-to-face meetings are pivotal to the initiative and particularly the implementation process, including training missions for new members, which are typically led by existing members. To facilitate greater autonomy, promote self-sustenance and support SIASAR's long-term sustainability, members should develop a financial strategy and business plan that seeks to increase the financial participation of members and identify alternative sources of funding.

Finally, SIASAR's success has been found to hinge strongly on the evolution of each member's rural water supply and sanitation sector. Specifically, political will, well-defined policies, a clear vision and the mechanisms to execute it have proven vital to the successful adoption, implementation and operation of SIASAR. To the contrary, a lack of sector policies and limited intuitional support for the rural water supply and sanitation sector, limits the progress and potential of SIASAR to inform the sector.

F. Moving Forward

The SIASAR initiative has grown from three members to 11 members in LAC in a relatively short period of time and has garnered international interest. Three critical areas are considered relevant to the success of the initiative moving forward: Consolidation in LAC, Opportunities for Expansion and Next Frontier in Development of the Conceptual Model and below is a summary of recommendations designed to progress each and described in detail in Section 7.

Consolidation in LAC

Recognizing the need to consolidate the rapid expansion of the initiative in LAC, current members are fleshing out an evolving vision for the initiative's trajectory that contemplates the balance between the level of government involvement and donor support needed to ensure the sustainability and relevance of the initiative moving forward. This approach would seek to strengthen government commitments through active participation in the development and maintenance of SIASAR as a means to generate additional buy-in and ownership and considers options at the regional and country levels.

At the regional level, develop a two-step strategy to transition from current levels of donor funding to increased autonomy. This would require the Regional Working Groups to be significantly strengthened to support the ongoing operation and maintenance of SIASAR through: (i) an initial period to create an effective management strategy; and (ii) a transitional period to roll out the strategy to further define the roles and responsibilities of donors and members. To this end, and with the Bank's support, members are currently drafting a strategic business plan to focus on the initiative's wider sustainability and explore the universe of possible options moving forward, comprising *inter alia* an analysis of different management models, such as creating: (i) a unifying regional association, or (ii) multiple regional bases designed to represent the interests of a smaller, more consolidated and theoretically more manageable group of members.

Identify alternative sources of funding and sponsorship. The Bank has played a significant financial role by supporting 68 percent of the initiative's regional operational costs over its four-year implementation period. Greater autonomy would require members to identify alternative sources of funding and sponsorship supported by a thorough cost benefit analysis and annual budget. As the initiative continues to expand, notwithstanding the significant outlay in capital costs required to develop SIASAR 2.0, economies of scale are expected to lead to cost advantages whereby operational costs per member will decrease with an increasing membership base. As operational costs stabilize affordability for many members should increase and the initiative should evolve into a financially self-sustaining organization. However, the successful transfer of responsibility for the ongoing management of SIASAR would be highly contingent upon securing and retaining the IT expertise required, a persistent problem for the initiative. To this end, the Bank is supporting members to conduct a detailed review of regional legal and policy instruments, and analyze alternative management models, with a view to supporting the strategic business plan to be presented and discussed at a high-level meeting with the relevant Ministers at Bank headquarters in September 2017.

At the country level, increase member capacity to better support the onboarding of new members to implement SIASAR, harness data analytics capabilities and ensure SIASAR's uptake long-term. SIASAR is a membership driven, collaborative process that has generated strong ownership and pride among members and symptoms of mistrust and apathy commonly associated with externally led initiatives have been avoided. To the contrary, the collaborative spirit and democratic process through which SIASAR was created and continues to progress may have cultivated a general lack of willingness among members to assume a role of authority. Furthermore, the Bank's involvement and continued

support may have engendered certain expectations. Similarly, while the Members' Memorandum of Understanding (MOU) is well-conceived conceptually, in practice commitment is still not embedded in each member's approach to SIASAR and there remains a lack of accountability to the implementation process particularly evident in countries with limited sector policies and weak or absent sector institutions. This highlights the need to increase ownership and management authority from within and could be partially achieved through strengthening SIASAR's Regional Working Groups. Additionally, as members increasingly use evidence-based results generated by SIASAR to support decision making within and beyond the sector, SIASAR's uptake should quickly evolve into a self-fulfilling prophecy.

Redefine the Bank's role and leverage donor support. With members assuming responsibility for the day-to-day operation of SIASAR, the role of the Bank and other donors, such as the IDB and AECID, can be redefined to focus efforts on providing strategic support to rural WSS operations and increasing capacity at the local level through targeted investments and technical assistance. Specifically, the Bank and other donors have a critical role to play addressing the gap in analytical capabilities and broadening the use of SIASAR data to support the inclusion agenda, in particular gender and indigenous peoples. Additionally, donors could actively support the mainstreaming of SIASAR in strategies and operations throughout the region, including in countries where they are not currently active, marketing SIASAR as the screening mechanism of choice for rural WSS interventions or supporting its inclusion as a disbursement-linked indicator (DLI) in Program-for-Results Financing (PforRs).

Opportunities for Global Expansion

SIASAR is poised to expand globally buoyed by interest from countries, the Bank, donors and NGOs in Africa and Southeast Asia. The Bank should continue to play a key role supporting the promotion of SIASAR as a global public good, ideally through a pilot in a new region. In particular, the Bank should support the following activities:

Determine the best management strategy moving forward, specifically, to evaluate the balance between maintaining a consolidated global initiative and decoupling future regional initiatives. Options include maintaining the current backend IT infrastructure while revising the frontend user interface to accommodate different regional requirements. Careful consideration must be given to the maturation of a potential member's rural WSS sector in order to determine the most appropriate use of SIASAR and to craft the best pathway to success.

Assess the maturation of a potential member's rural WSS sector to determine the most appropriate use of SIASAR and to craft the best pathway to success. Sector support is critical to SIASAR's success. Additionally, while many commonalities between regions exist, the practical application of SIASAR to distinct realities should be carefully evaluated to ensure the conceptual model aligns with governance models for data collection and decision-making. A well designed pilot program in Africa or Southeast Asia could support this process.

Draw on lessons learned from Latin America and the Caribbean to inform the mix of skills needed to successfully launch SIASAR in other regions. The Bank will likely need to continue playing a key role in facilitating knowledge sharing and providing technical assistance to bring new members on board especially in new regions. SIASAR's successful deployment will hinge on identifying: (i) adequate human and financial resources; (ii) champions within the Bank and local counterparts; (iii) opportunities to capitalize on existing datasets or leverage data collection activities (for example through PforRs); and (iv) partnerships with donors, NGOs and other interested stakeholders.

Increase credibility by developing an effective outreach strategy to engage global actors involved in the rural WSS sector. Opportunities for synergies with complimentary organizations should be explored in greater detail, including the Rural Water Supply Network (RWSN) and international NGOs such as SNV and WaterAid, in addition to evaluating synergies with existing tools such as the Water Point Data Exchange (WPDx) and WaterAid's Water Point Mapper, and finally, other conceptual methodologies such as the Balanced Scorecard and *Proyecto-Enlace.*

Next Frontier in Development of SIASAR Conceptual Model

Refine the conceptual model to accommodate global expansion, new contexts, emerging reporting requirements, and technological advances and to address the next generation of challenges and align with global monitoring initiatives. Although SIASAR was conceived prior to the establishment of the SDGs and remains first and foremost a tool for monitoring the sustainability of rural WSS services, the SIASAR conceptual model was recently refined to align the current framework with the SDGs where possible and SIASAR has now emerged as a complementary monitoring tool to inform the SDGs incorporating, for example, a simplified assessment of WASH in schools and health care centers.

The need to remain at the forefront of technological advances in line with SIASAR's final guiding principal is essential to ensuring the long-term relevance and success of SIASAR. SIASAR 2.0's ability to update a single data field remotely could respond to recent technological advances, such as low-cost sensors, which could be incorporated into SIASAR to enable the remote monitoring of systems. Similarly, opportunities exist to expand SIASAR's geospatial capabilities. For example, as data on schools and health centers are collected, SIASAR could highlight public facilities without access to water or sanitation

Finally, as the Bank's focus on sustainability in the rural water supply and sanitation sector continues to grow, a concerted effort to align concurrently evolving initiatives will be needed to ensure a coherent and cohesive approach within the Bank.

G. Report Outline

Chapter 1 provides an introduction to the water supply and sanitation context in Latin American and the Caribbean, the SIASAR initiative and rationale of the Technical Assistance. Chapter 2 presents the development objective, intermediate outcomes and indicators, components, outputs and associated tasks and finally, a brief description of methodology. Chapter 3 provides a detailed description of SIASAR, from conception to design to implementation, focusing on the institutional framework, conceptual model and IT ecosystem. Chapter 4 presents a summary of preliminary results to date and describes the ongoing research agenda while Chapter 5 summarizes the Bank's performance and efficiency in implementing the TA including an overview of associated costs. Finally, Chapter 6 presents a detailed review of the lessons learned and relevant recommendations before Chapter 7 summarizes options for moving forward.

1 BACKGROUND AND CONTEXT

1.1 Introduction

The impacts of limited access to water and sanitation on health, education and income generating opportunities are well established and underpin the World Bank's twin goals of ending extreme poverty and promoting shared prosperity. Globally, rural populations are disproportionately affected with more than half the rural population lacking access to improved sanitation and one-fifth lacking access to a water supply.[1] This marked demographic divide is reproduced in Latin America and the Caribbean (LAC) where rural populations continue to lag behind their urban counterparts.[2] Moreover, conventional measures of access have historically focused on rates of coverage with little consideration for the quality and level of service provided or the state of repair of infrastructure. A more holistic approach that includes the determinants of sustainability would better reflect local realities and is essential to meeting the Sustainable Development Goals (SDGs).

Important governance challenges have been found to impede the effective management of WSS services in LAC.[3] Rural populations are especially affected given the challenge of providing services is often borne by community-based organizations (CBOs) that frequently lack the financial resources and technical know-how necessary to fulfill their duties. Moreover, public investments in the rural sector have historically favored new infrastructure with little consideration for the financial and technical resources needed to deliver sustainable services long-term including operation and maintenance, and asset replacement and renewal. Moreover, the expansion of WSS networks are influenced by economies of scale meaning very small populations may be neglected altogether. Finally, regulatory and legal frameworks often prioritize urban areas leading to the absence of dedicated sector policies that clearly define the provision and quality of services in rural areas. This approach has led to underserved populations and poor quality WSS services in rural communities.

A lack of accurate, up-to-date and comprehensive data further compounds this problem, as little information is available for policy makers, planners and technical assistance providers to identify the needs and priorities of rural areas, make the case for adequate funding, better direct investments and technical assistance programs, and monitor existing services. Specifically, many sector agencies lack

1 UNICEF, 2015.

2 Recent estimates indicate 84 percent of the rural population in Latin America and the Caribbean has access to an improved drinking water supply and 64 percent have access to improved sanitation. This contrasts with 97 percent and 88 percent in urban areas (UNICEF, 2015).

3 In a recent study on water governance in LAC (OECD, 2012), the majority of countries evaluated were found to have "very important" or "important" policy, accountability, funding, capacity and information gaps.

the information systems necessary to facilitate this process. Where information systems do exist, the failure to prioritize resources for training and ongoing maintenance has led to their underutilization and, combined with their ever-changing nature, many information systems and supporting technologies have quickly become obsolete.[4] Moreover, information systems, which largely focus on asset management, are often complex and require exhaustive data collection and specialized skills that may exceed the capacities of local institutions. Finally, information systems have historically prioritized data collection with little to no emphasis on how data should be used to benefit the sector.

To address these gaps, most countries in the region need to improve the use of resources through better and more efficient priority setting, policy creation, project planning, and budget allocation and increase the quality and quantity of technical assistance provided to local communities to better understand the factors that contribute to the sustainability of rural WSS services. This requires improved information and knowledge management practices including prioritizing the need to systematically collect and regularly update data across scales and over time. An enhanced information system that better reflects local realities and assists decision-making processes is therefore critical to addressing persistent inequalities in the rural WSS sector in LAC.

1.2 The SIASAR Initiative

Many countries were acutely aware of the pressing need to develop better tools to address the needs of rural communities yet lacked the technical and financial resources necessary. In this context, the governments of Panama and Nicaragua articulated the need for systematic and reliable information for policy makers, national planners, and sector practitioners to make informed decisions for improving the rural WSS sector followed shortly by Honduras who had previously experienced the collapse of a pre-existing rural WSS information and management system. In response, the World Bank consolidated resources from several ongoing and proposed projects,[5] the Water Partnership Program (WPP), the Water and Sanitation Program (WSP), and the Spanish Fund for Latin America and the Caribbean (SFLAC) and the Rural Water and Sanitation Information System (SIASAR) was born.

Information Communications Technology (ICT) applications in the rural WSS sector have historically focused on infrastructure. To the contrary, SIASAR's innovative approach consists of a set of open-source, web-based and mobile applications to collect data on the quality and sustainability of services more appropriate for sector planning. Specifically, SIASAR comprises four basic components that define sustainable and efficient provision of WSS services in rural areas:

- **Access to basic services** as a function of coverage at the community level
- **Quality of service** as a function of service levels, and the functionality and physical condition of the infrastructure serving a community
- **Performance of service provider** (CBO, water board or cooperative) as a function of their level of organization, commitment to operation and maintenance and financial sustainability
- **Effectiveness of technical assistance** as a function of the resources and technical support allocated to rural communities

SIASAR aims to provide reliable information enabling a comprehensive management approach to rural WSS with a strong focus on the sustainability of services. To this end, it renders data analysis more transparent, more accurate, readily accessible, and comparable between countries. In order to transform this wealth of data into convenient, operational information for practitioners and decision-makers, the system generates performance indicators that are aggregated at several levels and automatically

4 For example, the Rural Water Information System (SIAR) in Honduras, which relied on external funding, performed reasonably well until funding ceased and all data rapidly became outdated (Smits et al., 2013).

5 The Water Supply and Sanitation in Low-Income Communities Project (PASAP, P082419) in Panama supported US$32 million of Bank lending aiming to benefit 62,000 people. In Nicaragua, the Rural WSS Project (PRASNICA, P106283) supported a US$20 million IDA grant/credit aiming to provide water supply and sanitation services to 90,000 beneficiaries in rural areas. The Rural Infrastructure Project (PIR, P086775), a US$47 million multi-sector infrastructure project to improve the access, quality, and sustainability of infrastructure services (roads, water & sanitation, and electricity) for the rural poor in Honduras, aimed to benefit 70,000 people with access to WSS services.

produces rankings and summary reports detailing the variables that factor into the performance of communities, systems, service providers, and technical assistance. In this manner, SIASAR successfully addresses the challenges faced by the rural WSS and promotes the long-term sustainability of rural WSS services by:

- responding to the general lack of up-to-date information on the status of rural WSS services
- generating important findings that can inform strategic policies and investment decisions
- evaluating the performance of service providers by assessing their level of organization and financial sustainability
- improving the effectiveness of technical assistance

Officially launched in 2011, SIASAR was successfully piloted in 2012.[6] Drawing on lessons learned from its application in the field, in 2013 efforts began turning toward improving the conceptual model and ICT tools, and formalizing the institutional and operational arrangements to consolidate and expand its use. Within this context the governments of Panama, Nicaragua and Honduras requested support to consolidate and expand the use of SIASAR as a decision-making tool for policy formulation, planning, and resource allocation, thereby improving the quality and sustainability of rural WSS service provision in the region.

1.3 Rationale of Technical Assistance

Operations and analytical and advisory services (ASA) financed by the World Bank's Water Global Practice (Water GP) were instrumental in providing technical assistance to develop the initial conceptual model, finance the development and programming of the first web platform[7] and coordinate, mobilize, and supervise activities in-country. To improve the continuity and long-term sustainability of the system, the WPP also financed the development of a user guide while the WSP facilitated a multi-institutional agreement between participating members.[8] This initial support enabled SIASAR to be successfully implemented in Panama, Nicaragua, and Honduras and later expanded to the Dominican Republic to regional acclaim.[9] Regional demand for the consolidation and expansion of SIASAR was high with El Salvador, Costa Rica and Mexico manifesting significant interest. With requests to expand SIASAR to new countries on the rise and donors increasingly focused on the rural WSS sector, the potential for SIASAR to positively enhance the quality and sustainability of the provision of rural WSS services and decision-making in LAC became all the more relevant. To successfully meet this growing demand SIASAR would need to be strengthened and refined.

In response to demands from the governments of Panama, Nicaragua and Honduras, the World Bank began providing dedicated non-lending technical assistance (hereinafter referred to as the "TA") in 2013.[10] Specifically, although fully functional, the initial roll out of SIASAR revealed several areas in need of technical improvement and in May 2013, the Water GP retained the Polytechnic University of Catalonia (UPC) to: (i) carry out a review of SIASAR's technical content and assess its usability for decision-making purposes; and, (ii) develop concrete recommendations to improve the initiative and information system, which resulted in the following recommendations (Table 1).

6 World Bank, 2013

7 Known as "SIASAR 1.0" by participating members.

8 'Members' and 'users' are used interchangeably throughout this document to refer to national or subnational governments currently participating in the SIASAR initiative and/or where SIASAR has been implemented.

9 In 2014, the Central American and the Dominican Republic Forum for Potable Water and Sanitation (FOCARD-APS) officially adopted SIASAR in their Regional Action Plan and included the extension of SIASAR to at least two more member countries by 2016 and to all member countries by 2018.

10 "SIASAR Consolidation and Expansion in LAC" (P148645) supported by the WSP through trust funds TF093845 & TF0A3271 and "6L Rural WSS Information System (SIASAR)" (P153736) supported by the Spanish Fund for Latin America and the Caribbean (SFLAC) TF016023. This report presents a consolidated review of both TA's through a detailed discussion of the achievements and results of the SIASAR initiative.

Table 1: Recommendations to Improve, Consolidate and Expand SIASAR

	Critical	Important
Operational	Improve web content (maps, reports, rankings, etc.)	Review and improve conceptual model (indices, indicators, performance matrix, forms, etc.)
	Review programming codes and associated IT tools	Develop methodologies to collect appropriate data for sanitation and hygiene
	Improve quality control and develop documentation	Improve documentation on human and material resources needed
	Develop a strategy for updating data	
Strategic	Strengthen the use of SIASAR data e.g. adopting SIASAR as the national rural WSS sector monitoring tool	Develop communication strategy and dissemination campaign
	Strengthen coordination at the regional level	Develop and conduct pilot assays
		Develop a capacity building program at local and regional levels

This TA directly supports the Water GP's business strategy to support poor-inclusive WSS sector reform, scale-up rural sanitation and promote sustainable WSS provision for rural areas and small towns outlined in the multi-year Programmatic Approach (PA)[11] designed to support technical assistance, analytical work, capacity-building activities, South-South and North-South knowledge exchange management and dissemination, and ongoing and planned operations. The TA also directly supports the World Bank's twin goals of reducing extreme poverty and promoting shared prosperity in a sustainable manner. For example, in the case of the former, SIASAR facilitates the identification of WSS systems in disrepair, which oftentimes belong to the poorest citizens. In the case of the latter, SIASAR collects information on the entire rural population (across wealth brackets) and permits a comprehensive assessment on the sustainability of systems and quality of service. Ultimately, SIASAR is intended to help governments and sector agencies strategically design and target interventions to areas of greatest need.

11 Pillar 3 Rural WSS, PA - 6L Delivering WSS Solutions in LAC - (P147684).

2 DEVELOPMENT OBJECTIVE AND RESULTS FRAMEWORK

2.1 Development Objective

The development objective of this TA was to support the consolidation and expansion of SIASAR as a decision-making tool for policy formulation, planning, and resource allocation. Ultimately, this TA aimed to enhance the sustainability and quality of service provision in the rural WSS sector in LAC. To this end, the TA included the following specific activities:

- building capacity of participating institutions to consolidate the use of SIASAR as a decision-making tool for policy, investment planning, and technical assistance
- supporting the expansion of the initiative to new, interested users in the region
- assisting members to improve SIASAR and associated tools

2.2 Intermediate Outcomes and Indicators

Table 2 presents a summary of the key intermediate outcome and indicators while Sections 4 and 5 describe the initiative's accomplishments in detail.

Table 2: Intermediate Outcome Indicator(s)

Intermediate Outcome(s)		IO Indicator(s)		Target
1	Development financing informed	1.1	Number of new operation(s) informed by SIASAR	2
		1.2	Number of existing operation(s) informed by SIASAR	3
		1.3	Mobilization of non-Bank resources	1
		1.4	Government expenditure informed	4

Continue

Intermediate Outcome(s)		IO Indicator(s)		Target
2	Policy/strategy informed	2.1	Number of sector policies informed	At least 1
		2.2	Number of planning tools or decision-making processes informed	4
		2.3	Number of national and/or subnational institutions supporting SIASAR	At least 1 per country
		2.4	Number of other stakeholders involved in the initiative	5
3	Client capacity increased	3.1	Number of countries with SIASAR team established	4
		3.2	Number of communities registered (and validated) in the system	Six thousand (6 000) communities registered
		3.3	Number of countries with detailed implementation roadmaps	At least 3
		3.4	Number of agreements signed	At least 1 regional agreement
		3.5	Number of new countries with customized systems	At least 1
4	Knowledge deepened	4.1	Number of regional exchanges	At least 2
		4.2	Number of partner-led pilots	At least 1
		4.3	Number of regional and global events attended	At least 3
		4.4	Number of journal articles and technical documents published	At least 1

2.3 Components and Outputs

The TA was comprised of three main components, supported by several tasks designed to address the key characteristics of each component as described in Table 3.

- **Component 1** (**Institutional strengthening to consolidate and promote the use of SIASAR**), sought to support the implementation of SIASAR by sector agencies focusing on effectively incorporating SIASAR data into policy design and decision-making processes, promoting SIASAR

as an inter-institutional tool, and consolidating and managing local databases.

- **Component 2** (**Expanding the use of SIASAR to new countries and other stakeholders**), sought to support countries interested in adopting SIASAR. In addition to providing general support and guidance to each country or region, the project provided technical assistance with developing and applying implementation roadmaps in addition to organizing knowledge exchange activities with experienced SIASAR countries. During the process, the TA also aimed to support the development of specific tools e.g. templates and implementation guidelines, to facilitate future incorporation of additional countries. Whenever possible, the TA attempted to include local NGOs in the process.

- **Component 3** (**Enhancing SIASAR's effectiveness as an RWSS planning tool**), sought to support technological improvements to SIASAR from an information technology and content standpoint. The technological improvements arose from an in-depth assessment commissioned by WSP and conducted by UPC[12] that included extensive consultation with existing SIASAR members. Among other aspects, the improvements aimed to refine existing analytical matrices, strengthening how SIASAR captures sanitation data, and improving the functionality of the public website (see Table 1).

2.4 Methodology

The three components were implemented in parallel. Parallel implementation was deemed necessary, as each task required an extended time frame for its development and to mobilize a different set of actors for each member. The TA supported regular regional working meetings to take stock of ongoing progress and agree next steps.

For the first component, the TA directly supported institutional strengthening activities within participating government agencies. For the second component, the TA supported members interested in rolling out SIASAR, first required to present an implementation roadmap (in line with the guidelines established in the SIASAR Regulations outlined in Section 3) and demonstrate adequate funds to support the data collection process. The TA provided strategic guidance to members on the implementation process and facilitated knowledge exchange activities with existing members. For the third component, the TA supported technological improvements to SIASAR based on the independent assessment conducted in 2013 (Table 1) prioritized according to member feedback and demand. This led to a membership-wide review process that began in April 2014 and continued throughout 2016 culminating in the launch of SIASAR 2.0 in April 2017 at the 3rd Regional Assembly in Cali, Colombia.

Table 3: Key Outputs and Associated Tasks

Output	Proposed Tasks		Indicators Informed
O.1 Institutional strengthening of national and regional institutions to consolidate and promote the use of SIASAR in policy planning decision-making	P.T.1.1	Institutional strengthening and capacity building of national WSS agencies to support the coordinated implementation of SIASAR	IO Indicator 1.4 IO Indicator 3.4
	P.T.1.2	Institutional strengthening of regional institutions (e.g. FOCARD-APS) to support hosting and managing SIASAR at a broader Central American level, to promote self-sustenance and long-term sustainability	IO Indicator 1.4 IO Indicator 3.1

Continue

12 UPC, 2013.

Output		Proposed Tasks	Indicators Informed
	P.T.1.3	Regional assemblies (one per year at grant closure) and working meetings to review the updated status of SIASAR and to evaluate implementation progress against agreed recommendations	IO Indicator 4.1
	P.T.1.4	Institutionalization of SIASAR within participating members' sector frameworks	IO Indicator 2.1 IO Indicator 2.2 IO Indicator 2.3 IO Indicator 2.4
O.2 Expansion of SIASAR to new interested countries and others stakeholders	P.T.2.1	Regional knowledge sharing activities in different countries (south-south knowledge exchange between experienced and new members)	IO Indicator 4.1
	P.T.2.2	Technical assistance and guidance to new members to help coordinate and define implementation roadmaps	IO Indicator 3.3 IO Indicator 2.4
	P.T.2.3	ICT/programming support to customize SIASAR	IO Indicator 3.5
	P.T.2.4	Disseminate the SIASAR initiative in regional and global forums	IO Indicator 4.3 IO Indicator 4.4
O.3. Support to enhance SIASAR's effectiveness as a rural WSS planning tool	P.T.3.1	Technical assistance to SIASAR members in the implementation of activities to improve SIASAR's technological content and usability for decision-making following the key concept of sustainable rural WSS service provision[13]	IO Indicator 1.1 IO Indicator 1.2 IO Indicator 1.3 IO Indicator 3.2
	P.T.3.2	Implementation of pilot assays (to improve data collection, incorporate more actors, and explore new applications of SIASAR)	IO Indicator 4.2
	P.T.3.3	Follow-up research based on new areas for improvement that may emerge from technical assistance provided	IO Indicator 4.5

13 Based on recommendations agreed upon by the countries during the September, 2013 workshop and related to the consultancy "In-Depth Review of the Rural Water Supply and Sanitation Information System" carried out by the Polytechnic University of Catalonia (UPC).

3

SIASAR: DEVELOPMENT AND DESIGN

3.1 A Collaborative Process

The SIASAR initiative is a collaborative process driven by the needs of the rural WSS sector as experienced by each member. In the early stages, regular interactions between the governments of Panama, Nicaragua and Honduras and the World Bank helped shaped the SIASAR initiative. Specifically, SIASAR was developed collaboratively based on the technical experiences of various national agencies from each of the three original members, including Panama's Ministry of Health (MINSA),[14] Nicaragua's New Social Investment Fund for Emergencies (Nuevo FISE), and the Honduran National Autonomous Water and Sewerage Service (SANAA), culminating in the first conceptual model in 2011. Thereafter efforts shifted towards developing preliminary ICT tools and later the data collection process, leading to the first pilot studies in 2012. Based on experiences gained through its successful application in the field, members then turned their attention to improving and refining the conceptual model, IT ecosystem and broadening the suite of ICT tools. To date, data has been collected from more than 23,500 rural communities across eight countries enabling some members to begin the analytical process, facilitating decision-making and informing sector policies.

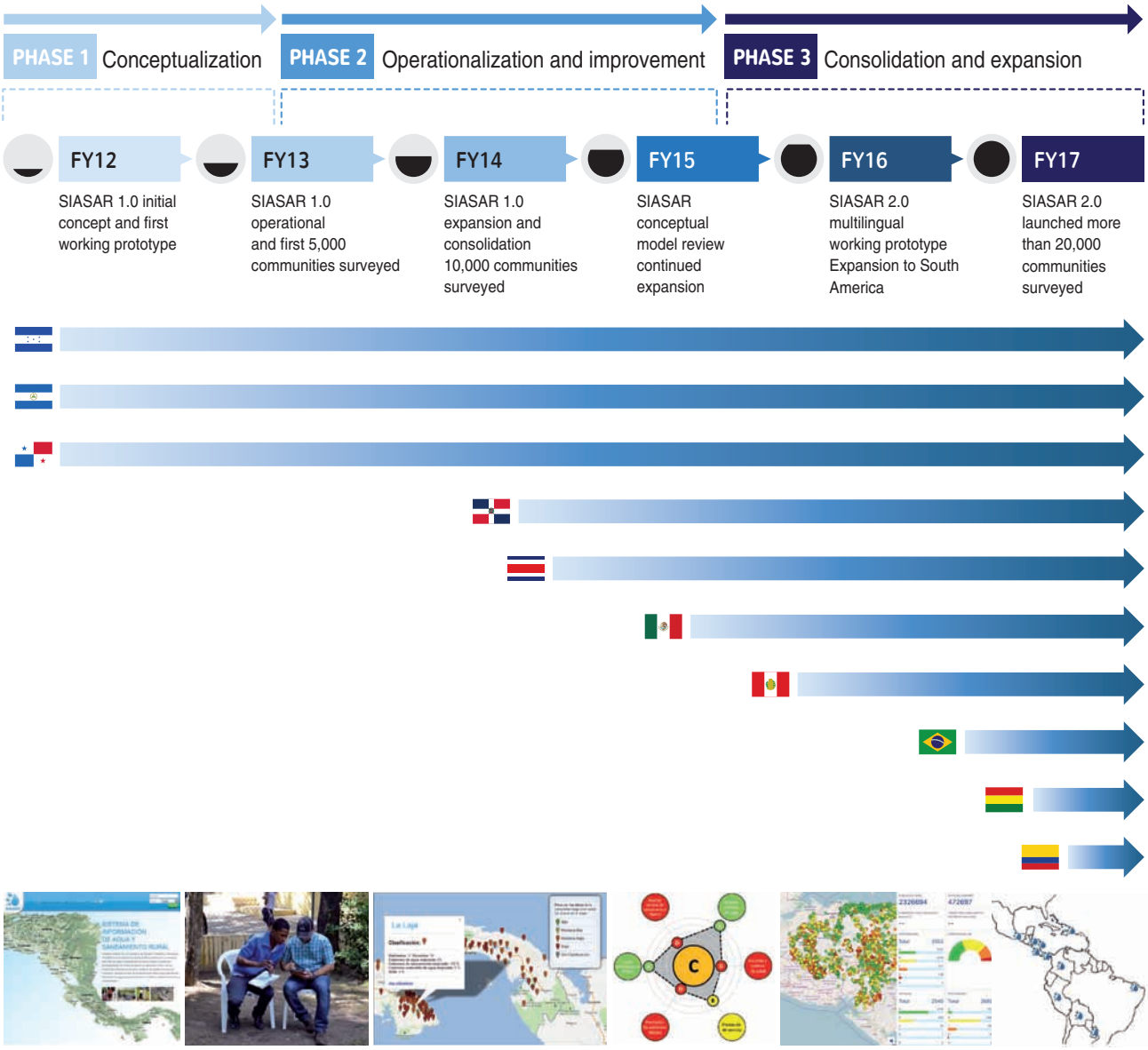
Critical to the development process has been the ongoing commitment to the Guiding Principles upon which SIASAR was founded promoting a collaborative approach to its development and implementation. Regional cooperation facilitated by SIASAR's flexibility to adapt to the needs of different users has also been fundamental. Finally, the need for dedicated expertise comprising sector and IT specialists from each of the participating members – a practice since enshrined in the MOU signed by all members – was identified early on in the process and has been pivotal to SIASAR's implementation and expansion objectives.

Shortly after SIASAR was successfully piloted, other countries manifested interest in joining the initiative. With strong support from the TA, the expansion of SIASAR began, starting with the Dominican Republic in early 2014. In April 2014 the Central American and Dominican Republic Forum for Potable Water and Sanitation (*Foro Centroamericano y Republic Dominica de Agua Potable y Saneamiento*, FOCARD-APS) formally adopted SIASAR as its regional information system for the rural WSS sector. The initiative then expanded to Costa Rica, the State of Oaxaca in Mexico, and Peru in 2015 and finally Bolivia, Colombia, Paraguay, and the State of Ceará in Northeast Brazil in early 2016, successfully scaling knowledge from lower- to upper-middle-income countries. Existing members were instrumental to facilitating the smooth entry of new members and interest continues to grow both within the region and

14 Represented by DISAPAS, the Director for Potable Water and Sanitation.

globally. For example, Argentina, Guatemala, and Mozambique (who participated in the most recent General Assembly in Colombia), have all expressed interest in joining.

Figure 1: Progress Over Time



SIASAR's attractiveness stems from its ability to offer users a free and open, fully operational information system with global relevance that responds directly to client demands. Moreover, its unique participatory process engenders ownership and pride, and creates genuine learning exchanges and ties among users, further cementing its integration into rural WSS sector management. Since its inception, SIASAR has achieved a high degree of ownership and support. To date, 11 countries have joined the initiative in Latin America and data from more than 23,500 rural communities, representing 10 percent of all rural communities in those countries, or some 11 million people, have been collected and validated by members using SIASAR (Table 3).

BOX 1: SIASAR: Characteristics of an innovative decision-making tool

SIASAR seeks to improve the operational value of existing rural WSS information systems. To ensure the long-term, practical use of information, it emphasizes eight guiding principles:

- **SIMPLE** Limited to key information needed by practitioners and policy makers.
- **CONCEPTUALLY ROBUST** Based on a solid technical conceptual model.
- **INSTITUTIONALIZED** Incorporated into the processes of each country or region's WSS sector.
- **OPEN** Transparent to all actors.
- **HARMONIZED** Adapted to each country or region but harmonized among them to ensure information comparability.
- **ADAPTED** Responding to needs identified at various levels within government, civil society, and multilaterals.
- **FLEXIBLE** Capable of evolution and replication.
- **UP-TO-DATE** Using state-of-the-art technology to simplify data collection, updating, and analysis.

3.2 Ratification of SIASAR

As defined in the Guiding Principles (**Box 1**) institutionalization is critical to the implementation process and SIASAR must be incorporated into each member's rural WSS sector framework prior to rollout. However, despite forming part of SIASAR's official regulations, institutionalization is a political process supported by the initiative primarily at the regional level and, if members do not mainstream the process, has limited impact at the subnational and municipal levels in practice. Moreover, as compliance is self-governed, members are only accountable to themselves.

Beyond the Guiding Principles that require sector institutions to formally adopt SIASAR as their primary tool for managing rural WSS systems, numerous members have noted the importance of coordination among actors to achieve SIASAR's main objectives of enhancing the sustainability of WSS services and improving decision-making by ensuring the availability of reliable and up-to-date information, an integral part of the open and collaborative process that underpins SIASAR's development.

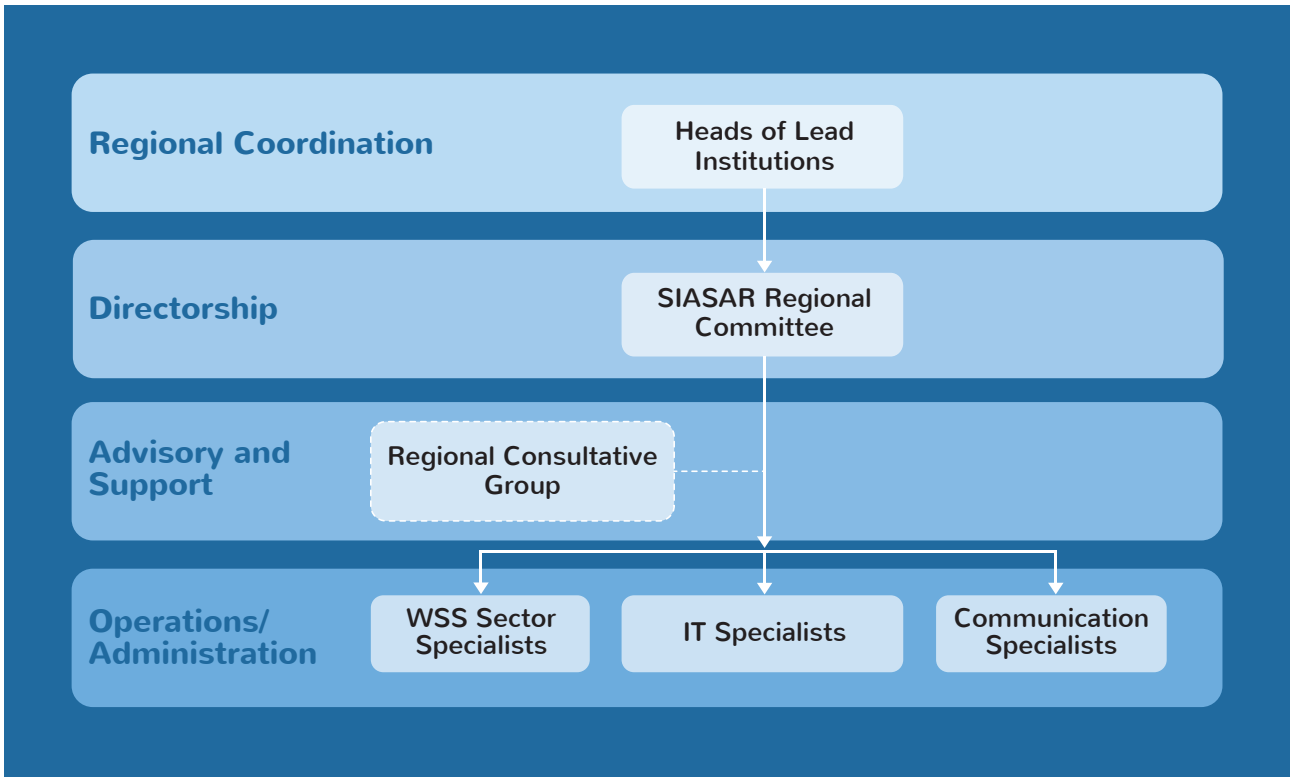
Figure 2: Ratifying the Adoption of SIASAR

3.3 Institutional Framework of SIASAR

In 2014, existing members formerly established the structure governing the SIASAR initiative (Figure 3). A member is elected *Pro Tempore* Coordinator during a given annual assembly and holds the position for one calendar year. Thus far Panama, Nicaragua, Honduras, Costa Rica and the 2017 coordinator, the Dominican Republic, have assumed responsibility for this role. The *Pro Tempore* coordination team is responsible for convening regular coordination meetings, presenting agendas, following up agreements and agreed activities, and representing SIASAR at the international level. Different groups assume the day-to-day coordination and operation of SIASAR and most work is conducted virtually at varying frequencies.

The **Regional Steering Committee** comprises SIASAR Coordinators from each country or region (typically the director or coordinator of rural WSS for their respective institution). The Committee meets two to four times per year to discuss the strategic aspects related to SIASAR, such as budget, election of *Pro Tempore* Coordination or the entry of new members. The **Sector Group** is composed of WSS sector specialists from the institutions responsible for SIASAR's implementation. This group meets bi-monthly and may form smaller technical working groups dedicated to a particular aspect e.g. improving fieldwork methodology. This group is responsible for questionnaires, indicators, indices, data validation, reports, etc. The **IT Group** is formed of IT specialists from the institutions implementing SIASAR and meets twice per month, but may also form specific working groups that meet more frequently. This group is responsible for programming developments, maintenance of local servers, training and technical assistance for ITC tools, user management, etc. The **Communication Group** is the newest group and meets bi-monthly, or before each individual event to prepare specific media plans tailored to each activity and, is comprised of members who are commonly, though not always, communication specialists in their respective institutions.

Figure 3: SIASAR Governance Structure



Coordination and collaboration are enshrined in the institutional framework and various agreements ratifying the adoption and use of SIASAR, such as:

- The Regional Agreement signed by the Council of FOCARD-APS dated April 1, 2014 adopting SIASAR as the regional information system, freely accessible as a common, public good for member countries.[15] All agreements signed by new members who join the SIASAR initiative, irrespective of their region, are based on this agreement. The Regional Agreement also served to formalize SIASAR's Regional Regulations, which define the operation of the initiative at the country and regional levels, establishes governance and outlines the rights and responsibilities of each member.
- Decree No. 32.024 dated August 2016 published in the Official Gazette of the State of Ceará formalizing the adoption of SIASAR as the state's information system for rural WSS management (Chapter I, Article 2, section 4) and mandating all state institutions to comply.
- In November 2016, SIASAR was integrated into Colombia's National Water and Sanitation Investment System (SINAS) as a key instrument for the implementation of the national policy on water supply and basic sanitation in rural areas established by the National Council for Economic and Social Policy (CONPES 3810 of 2014).
- In December 2016, Bolivia included SIASAR in its National Water and Sanitation Strategy for the Rural Sector and Small Localities (2017) as the official information system of the Ministry of Environment and Water.

The experience, capacities and ownership cultivated over the course of the SIASAR initiative have empowered members to increasingly take leadership roles and responsibilities in the day-to-day operation of the information system. Beyond data collection requirements, the terms and conditions of membership also outline each member's nominal financial contribution and staff commitments. Members currently contribute approximately US$1,000 (paid in cash) for the use and maintenance of servers to host the SIASAR information system.[16] Although the level of financial contribution is manageable, complying with national procurement rules created minor administrative challenges for some members.[17] Additionally, each member agrees to dedicate one sector specialist, two fulltime IT specialists to maintain local databases and provide general programming support to SIASAR, and one communication specialist. Discussions are underway among member countries to boost the financial contribution to cover additional dedicated personnel.

3.4 Implementation Roadmap for New Members

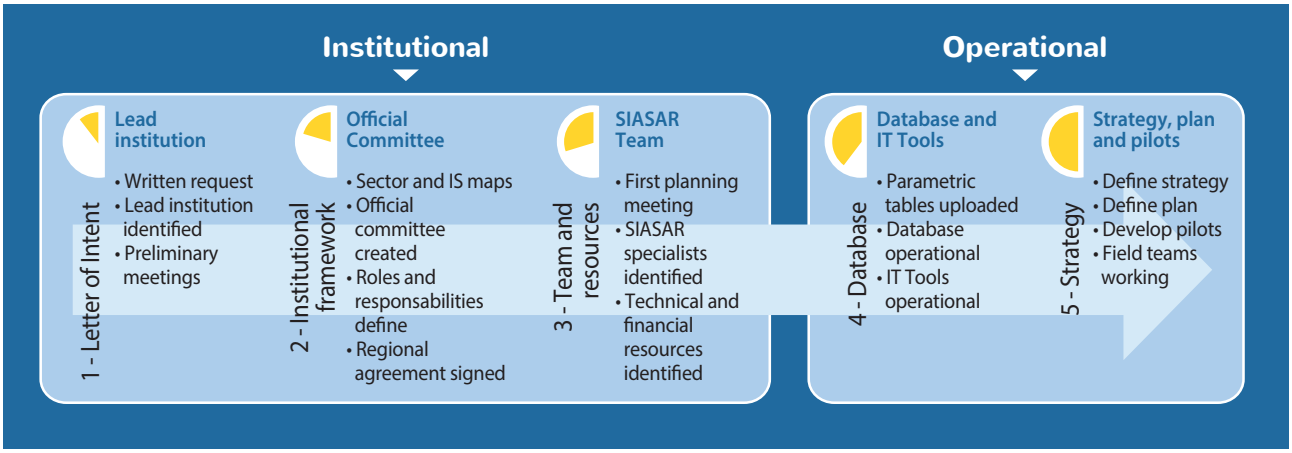
Given SIASAR's unique position as a collaborative initiative between countries, there was a need to design a formal implementation process to: (i) ensure expectations remain transparent and achievable; and, (ii) define a framework to facilitate the effective and efficient integration of new members into the initiative. The implementation roadmap is based on the initiative's Guiding Principles as well as lessons learned acquired by members during the on-boarding process and is organized around two main components: institutional and operational.

15 Signatory members included: Panama, Nicaragua, Honduras, El Salvador, Costa Rica and the Dominican Republic.

16 After power losses in Central America led to unreliable access and concerns about loss of data on locally stored servers, data were moved to a cloud server, currently managed by a US-based firm. However, countries provide the use of local servers for some testing activities.

17 It has been difficult to identify a mechanism through which countries can easily transfer funds internationally. In Central America, member countries transfer funds to FOCARD-APS who subsequently forward funds to the Central American Integration System (SICA), an internationally recognized political and economic regional organization with the capacity to transfer funds internationally.

Figure 4: Implementation Process Map



The lead institution is generally the sector authority and is responsible for identifying participating institutions and agencies as well as defining the implementation strategy. The Official Committee comprises the lead institution and other interested agencies, in addition to donors, Non-Governmental Organizations (NGOs) and CBOs that can ideally provide technical or financial assistance. Together with the Official Committee, the lead institution must define the implementation strategy that specifies how the member's objectives would benefit from SIASAR and identify sources of funding. The detailed plan then defines the implementation timeline, operational roles and responsibilities of participating actors, as well as the expected costs of implementing SIASAR.

A crucial component of the implementation process is the adaptation of SIASAR to the local context, for example, administrative divisions, lists of communities, languages, sources of funding, sector institutions, etc. This forms what is commonly known as the parametric tables that populate the information system. Moreover, the vocabulary of all instruments must be adapted to the local context. In practice, this implies a complete translation from standard academic language to the day-to-day local vernacular used by each member. This is supported by the Dictionary of Terms, developed to ensure the harmonization of concepts and processes fundamental to data analysis and comparability. The final step is to define the operational and logistical means necessary to implement SIASAR in practice, such as: vehicles, fuel, computers, Internet access, etc., which are primarily defined through pilot studies.

Although these steps are fundamental to a new member joining the SIASAR initiative they may evolve differently in each case. In addition - and perhaps more decisive - each new member must understand they are not acquiring a system, but instead joining a collaborative effort. As a result, each member must ensure ownership and commitment while adding their capabilities to the existing pool of knowledge. To reinforce this aspect, various preparatory missions are conducted in addition to an official implementation mission led by more experienced members. The latter focuses on training, preparing teams to join the relevant regional working groups, conducting pilots in the field and culminates with publishing the first community data point in SIASAR.

Members that have followed the implementation process thus far include the Dominican Republic, Mexico (Oaxaca), Bolivia, Paraguay and Brazil (Ceará). The Dominican Republic, Ceará and Bolivia have successfully completed their integration process and participated in an implementation mission. In the case of Bolivia, the process resulted in a roadmap with clearly defined objectives, processes, schedule and costs, and is currently helping the government to leverage collaborations with other administrative units, strategic partners, donors and NGOs. The implementation process in Ceará was challenging given the need to translate SIASAR into a new language, Portuguese. Nevertheless, the process was a success and the state has since managed to leverage federal resources to support large data collection efforts scheduled for 2017 and 2018. In Oaxaca, while there was full support for the

Figure 5: Core Entities Influencing Sustainability of Rural WSS Services

implementation mission and the process began well, the budget for data collection activities was tied to a Bank PforR that was subsequently postponed thereby halting the implementation process.[18] Activities are expected to recommence in July 2017, as the PforR has been recently reactivated. Finally, Paraguay is still immersed in the initial steps of the implementation process, which has been affected by changes to their team. However, the instrument continues to guide institutions during this process.

3.5 The Conceptual Model

3.5.1 Core Sustainability Entities

SIASAR aims to address the sector's historical bias toward new infrastructure by analyzing the level of service from the perspective of four core entities: Community, Service Provider, System, and Technical Assistance Provider (Figure 5). Each of the four core entities is assessed through different variables known to affect the sustainability of rural WSS services, such as: community hygiene, status of infrastructure, quality and continuity of service, water quality, tariffs, type of service provider, legal status of the service provider, gender equity, accountability frequency of technical assistance, technical and financial resources, etc. Data are collected through four basic field questionnaires (one per core entity). This particular concept has proven effective and has remained unchanged since SIASAR's inception in 2011.

3.5.2 The Sustainability Metric

Based on the principle that all data must facilitate the decision-making process, the model was conceived as a sustainability metric designed to assess functionality of a given service and its components over time. The same four levels (or states) of sustainability apply to all elements and indices used in SIASAR. These levels, called ABCD ratings or classifications, are determined when each indicator or index reaches a certain score:

- "A" corresponds to the optimum service level. This is the usual score for new infrastructure or services, and should be maintained.

18 Oaxaca Water and Sanitation Sector Modernization PforR - MAS Oaxaca (P145578).

- "B" corresponds to an acceptable level of performance, though certain problems have emerged. The service requires attention, but the community has the financial resources and technical knowhow to address the problems.
- "C" indicates an inadequate level of operation that must be corrected or rehabilitated. In this case, the community needs external support in order to solve the problem.
- "D" represents the lowest level and is indicative of a non-existent service or an offline system in need of full recovery. In this case, the community needs external financial and technical support.

This classification scheme is based on the premise that sustainability will decrease i.e. descend from A to D, if a service does not receive the necessary attention and care required to maintain optimal functionality. As such, sector efforts should focus on guaranteeing the maximum classification possible or to increase efforts whenever a decrease in classification occurs. All indices, indicators and data collected in the field must feed into the Sustainability Metric. This method of constructing a model has informed all iterations of the system.

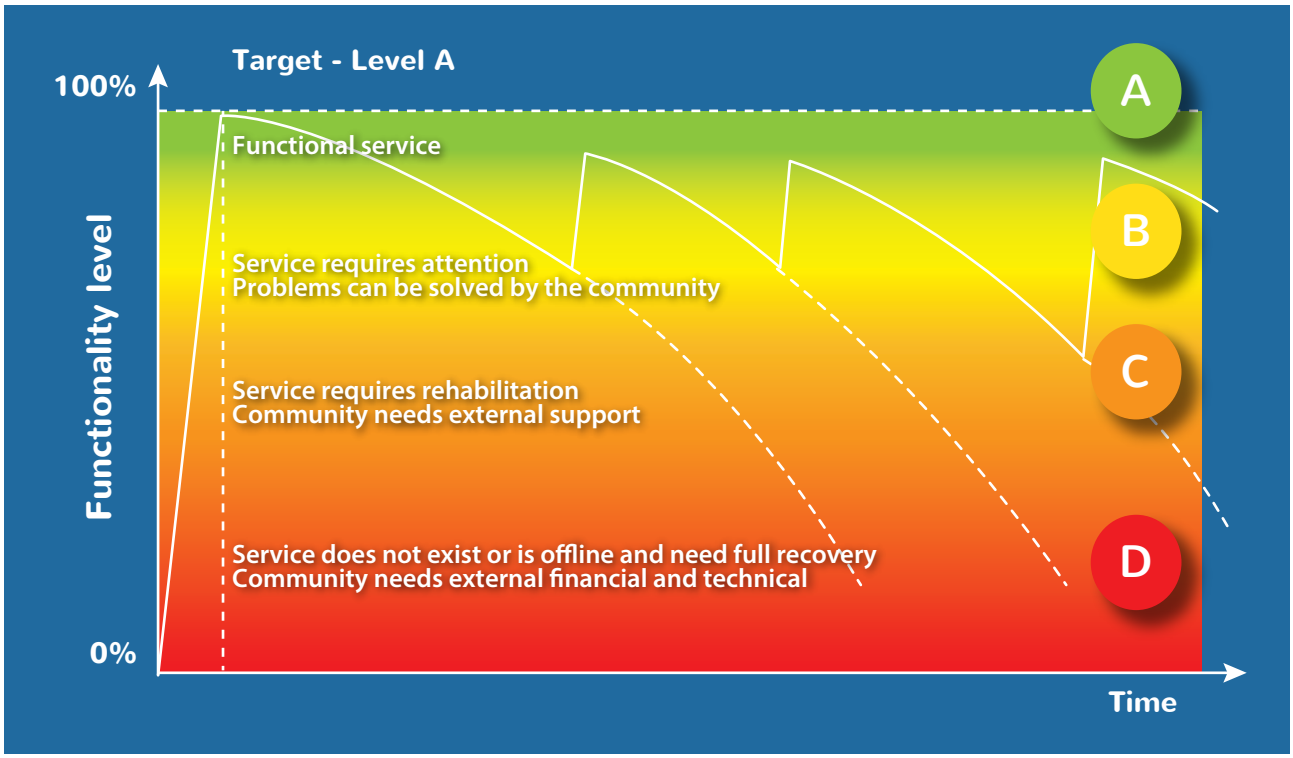
3.5.3 From SIASAR 1.0 to SIASAR 2.0

Like all information systems, SIASAR has had to evolve in order to remain relevant, as well as adaptable, flexible and up-to-date in line with its Guiding Principles. Notably, in 2013, an in-depth evaluation identified a series of critical recommendations to improve the model (see Table 1). This led to a formal review process that began in April 2014 with the following specific objectives:

- **Capitalize on lessons learned**: While most data were adequate, the results indicated there were specific situations in which the ABCD classification did not reflect reality. For example, despite obvious problems being observed in the field, very few conventional systems resulted in a C or D classification.

- **Refine the indices to more accurately reflect each component of service**: After two years of use, the map illustrating the ABCD index for communities had become the benchmark for members; however, water supply was not being

Figure 6: Sustainability as a Measure of Functionality over Time



effectively captured and final classifications were disproportionately influenced by sanitation and hygiene.

- **Harmonize SIASAR with the main global monitoring standards:** The Sustainable Development Goals (SDGs) created after SIASAR's inception include aspects that had not been taken into consideration, but which members considered important.

- **Adapt SIASAR to the changing needs of members:** Latin America and the Caribbean is not a homogenous region and the needs of each member must be carefully considered. For example, while Spanish is the most widely spoken language in LAC, English, French, and Portuguese, in addition to a multitude of indigenous languages, are also spoken throughout the region.

Based on findings from the review process, the TA supported the development of a new model (SIASAR 2.0) over the course of 2014, 2015, and 2016 while remaining true to the initiative's original Guiding Principles and preserving the four core entities known to impact sustainability of rural WSS services. Using SIASAR 1.0 as a starting point, the process of redefining the conceptual model specifically focused on: (i) identifying basic data gaps; (ii) redefining indicators; and (iii) conceptualizing the classification rules through the multi-attribute utility theory and aggregate indices. The following sections describe SIASAR 2.0, officially launched in April 2017.

3.5.4 Water and Sanitation Performance Index

The conceptual model provides a detailed perspective of different aspects concerning water and sanitation services and defines methodologies to aggregate the information in thematic indices. The conceptual model is first made up of a battery of sixty 60 indicators, classified into 24 components, which in turn are grouped into a reduced number of six dimensions (Table 4)[19]. At a higher level, these dimensions are aggregated into two sub-indices: (i) the Water, Sanitation and Hygiene Service Level Index (WSHL), and (ii) the Water Services Sustainability Index (WSSI). These two partial indices generate a final aggregated index: the Water and Sanitation Performance Index (WSP). Furthermore, the conceptual model incorporates two complementary indices, providing additional useful information: (i) Lack of Components Index (LOC), and (ii) Low Performance Components Index (LPC).

Table 4: Core Entities Influencing Sustainability of Rural Water Supply and Sanitation Services

Water and Sanitation Performance index for rural communities (WSP)	
Water, Sanitation and Hygiene Service Level Index (WSHL)	**Water Services Sustainability Index (WSSI)**
Water Service Level (WSL)	**Water System Infrastructure (WSI)**
Accessibility (ACC) Continuity (CON) Seasonality (SEA) Quality (QUA)	System Autonomy (AUT) Production Infrastructure (INF) Water Catchment Area Protection (PRO) Treatment system (TRE)
Sanitation and Hygiene Service Level (SHL)	**Service Provision (SEP)**
Sanitation Service Level (SSL) Personal Hygiene (PER) Household Hygiene (WAT) Community Hygiene (COM)	Organization (ORG) Operation & Maintenance (OPM) Economic Management (ECO) Environmental Management (ENV)

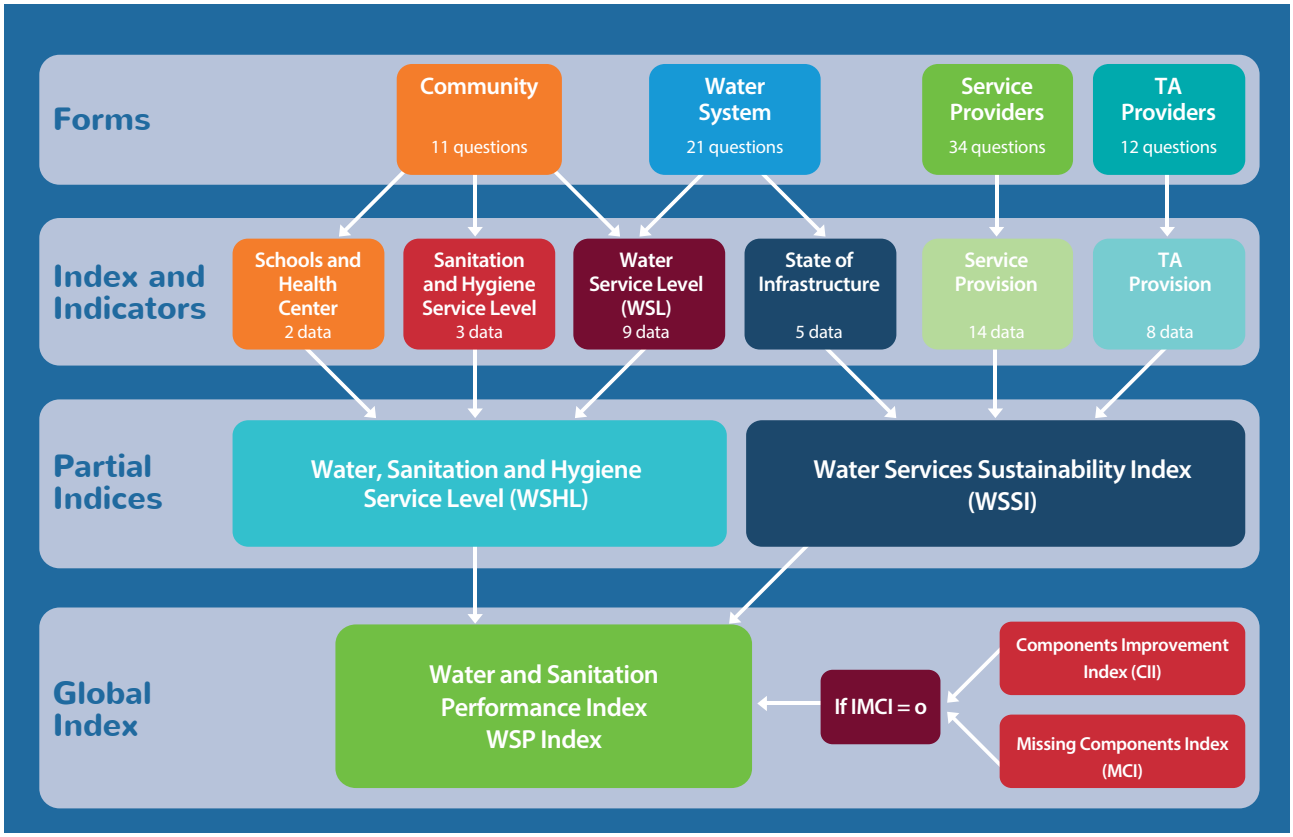
Continue

19 An analysis was undertaken to determine the most appropriate weighting technique for each indicator and resulting indices. Based on the results obtained, equal weighting was determined to be the most appropriate. This offers greater transparency and simplicity when implementing and interpreting results. A second analysis was undertaken to determine the most appropriate aggregation technique. Based on the results achieved, additive aggregation (summation of results) was determined to be the most appropriate method for the four components while indices are constructed using geometric aggregation.

Water and Sanitation Performance index for rural communities (WSP)	
Water, Sanitation and Hygiene Service Level Index (WSHL)	**Water Services Sustainability Index (WSSI)**
Schools and Health Centers (SHC)	**Technical Assistance Provision (TAP)**
Water Supply in Schools (SWA)	Information Systems (ICT)
Water Supply in Health Centers (HWA)	Institutional Capacity (INS)
Sanitation and Hygiene in Schools (SSH)	Community Coverage (COV)
Sanitation and Hygiene in Health Centers (HSH)	Assistance Intensity (INT)

The entire review of the framework of indices and indicators led to the logical redefinition of the field questionnaires. For example, in order to respond to the challenge of adequately monitoring sanitation, this component was strengthened, focusing less on classical infrastructure, and more on its use, as well as hygiene practices within the community. In the case of water supply systems, the questionnaire was modified to allow the flexibility to accommodate different configurations (an uncommon approach in other models) whereby systems may have several catchments, storage tanks, treatment types or distribution networks. In the case of the service provider, the questionnaire includes information from community associations as well as other entities such as public companies, associations, etc.

Figure 7: Water and Sanitation Performance Index (WSP)



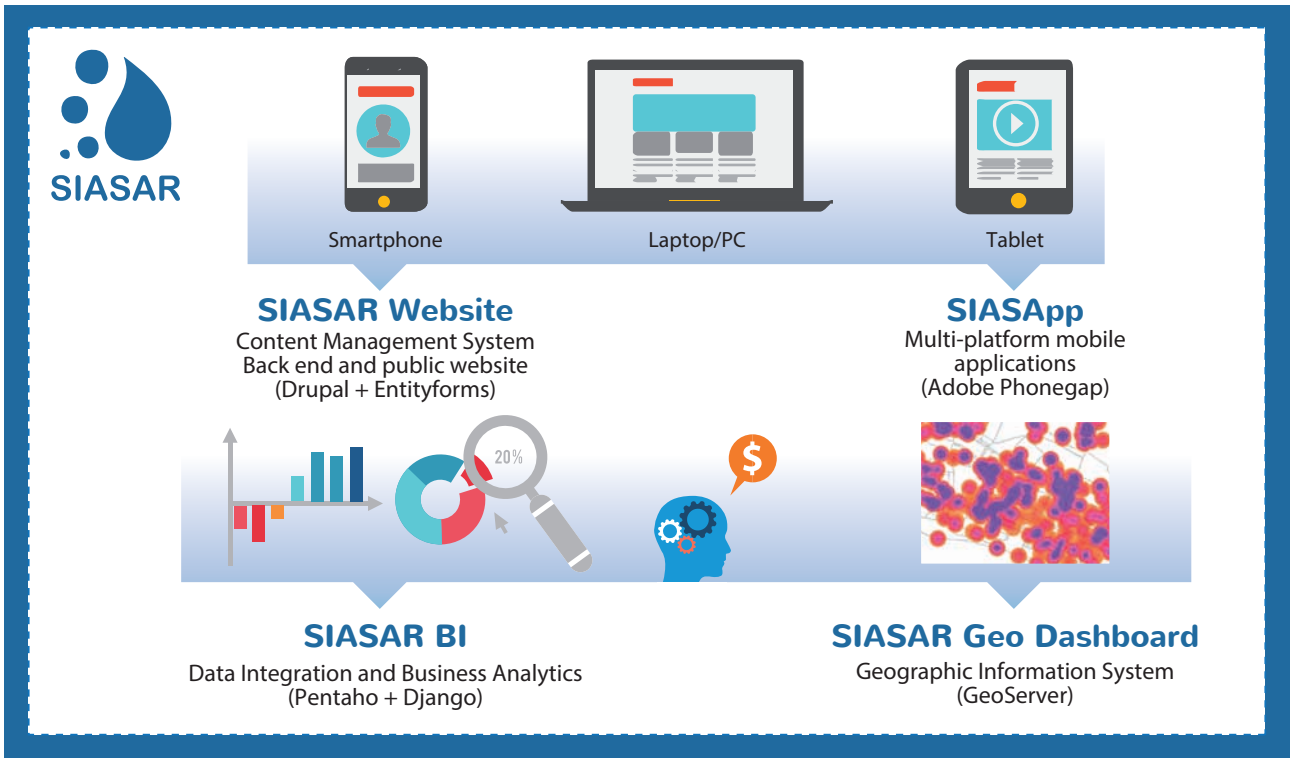
3.6 The SIASAR Information Ecosystem

3.6.1 The SIASAR 2.0 IT Platform and Smart Apps

SIASAR was designed with the goal of creating a free, open source platform aligned with the guiding principles of the SIASAR initiative to be simple, robust, flexible and up-to-date. Initially, the IT team included staff from the founding members (Honduras, Panama and Nicaragua) who, despite limited resources, developed an optimized platform tailored to the unique needs and requirements of the rural WSS sector. In addition, they created a public website with a private backend using a number of programming languages (PHP, HTML and Java) linked to an open-source database management system (MySQL) resulting in SIASAR 1.0. Data were subsequently published on a Google-based map to the public website. To produce technical reports and graphs (known as the inner dashboard) and due to a lack of time, they opted to use a licensed software solution. However, when the license expired their ability to update data was restricted affecting the platform's sustainability. Moreover, stress tests were never conducted using the maximum working load of the system and as the amount of data collected increased, problems began to emerge.

With increasing technical problems and an evolving conceptual model, the decision was made to develop a new platform. Supported by the TA, specialized IT consultants were recruited to assist the members' IT staff with this process. Bearing in mind the variable profiles and capacities of local IT teams, the selected technologies were designed to be as simple as possible from their conception through to their implementation and end use. Furthermore, the methodological approach aimed to encourage a collaborative work environment that promoted knowledge sharing with the final objective of developing a sustainable and easy to manage platform. Analyzing the technological requirements, resources, staff profiles and timing, the TA supported local IT teams to select the most appropriate technology and design of the new platform (SIASAR 2.0) as well as the suite of associated tools, using the following free, open source technologies:

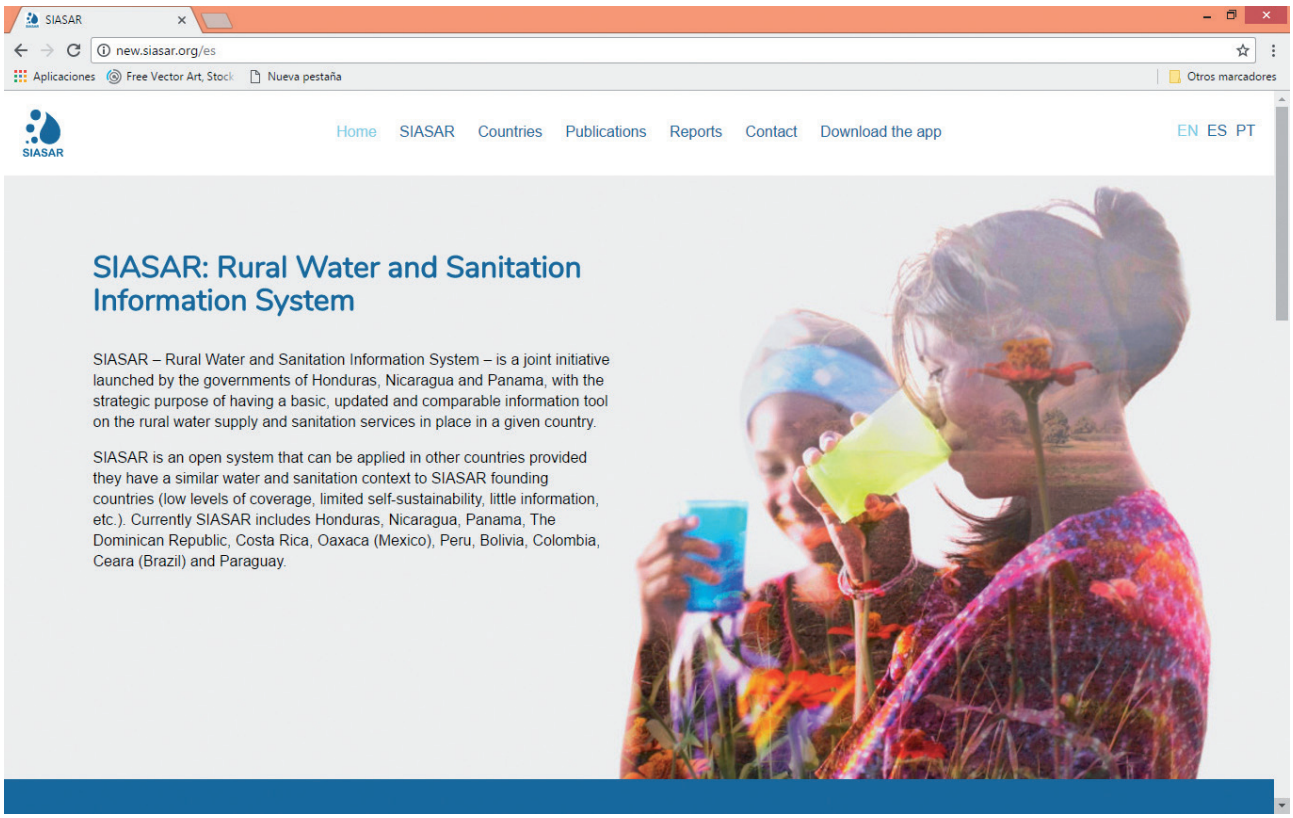
Figure 8: SIASAR IT Platform and Associated Apps



SIASAR 2.0 Collaborative Workspace. The IT team is decentralized, fast-growing and suffers from a high turnover rate, thus the need for a collaborative, on-line workspace and management system is critical to SIASAR's success. The IT team developed a collaborative workspace using GITlab,[20] a cloud-based application for managing digital content. Specifically, it records and manages historical changes to projects, files and documents enabling teams to recall particular versions at a later date. In addition, it facilitates collaboration between staff despite their distance. Working together, the local IT Team and specialized IT consultants designed a work plan that included numerous training components in order to transfer the knowledge needed to support the new system and build the capacity of member staff. The team was divided into four subgroups, in order to allocate the tasks and trainings, with the idea of sharing knowledge and responsibility among the different members and technicians. Coding requirements, document creation, technical problems and assignments are defined and managed through GITLab.

SIASAR Website (www.siasar.org). Using a Content Management System (CMS) to manage content for the platform's backend and public website reduces the time and knowledge needed to program, update and maintain the platform. The SIASAR 2.0 website was developed using Drupal,[21] a modular, extendable open source CMS for web content management and digital experiences with strong capabilities and endless flexibility. Using Drupal's **Entityform** module integrates frontend user-defined survey forms with Drupal content.

Figure 9: Water and Sanitation Performance Index (WSP)



20 https://about.gitlab.com/

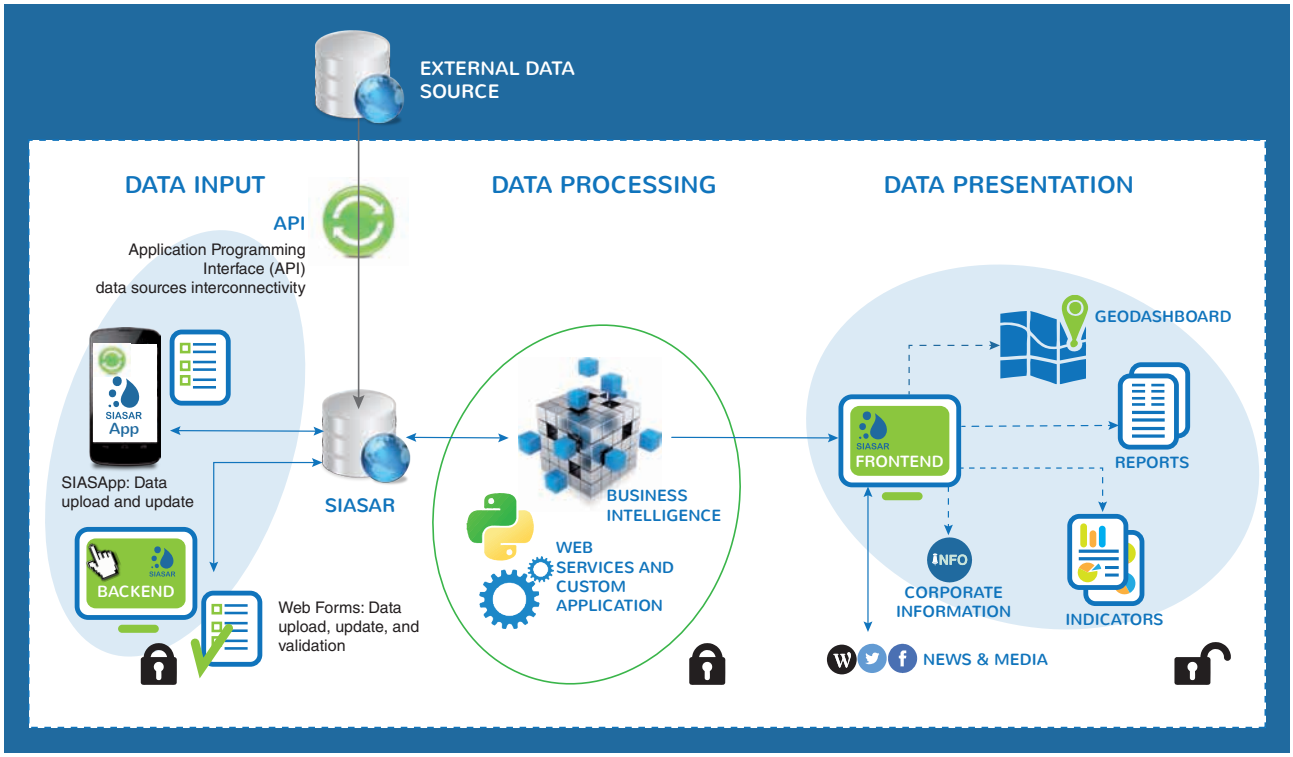
21 https://www.drupal.org/

SIASApp. Mobile applications facilitate the data collection and update process eliminating the need for paper-based surveys if desired. The SIASAR 2.0 mobile application was developed using Adobe Phonegap,[22] a free and open source development program that enables the design of a single mobile application for use across multiple platforms (iOS, Android, Windows) without modification.

SIASAR Geo Dashboard. The visual representation of data is integral to SIASAR's mission to remain accessible and transparent. The TA supported the development and implementation of a Geo Dashboard using Geoserver,[23] an open source server for sharing geospatial data. Integrated into the website, the SIASAR Geo Dashboard illustrates geospatial information in addition to graphs and additional data.

SIASAR Business Intelligence (BI) Engine. SIASAR's strengths lie in its ability to analyze data and generate relevant management reports to support decision-making underpinned by BI technologies. Pentaho[24] is a comprehensive data integration and business analytics platform that provides tools to prepare, analyze, visualize, explore and report data. This suite of tools was tailored to SIASAR needs and is currently used to calculate the indicators and indices and generate dashboard content and technical reports. Notably, an alternative package had originally been selected, however, with the integration of Ceará (Brazil) into the SIASAR initiative and with a view to capitalizing on existing in-country capacities with the foresight of ensuring future capacity building initiatives/knowledge transfer between members, the IT team unanimously opted to adopt Pentaho given Ceará's vast experience and pre-existing knowledge of the program.

Figure 10: Data Processing Functions

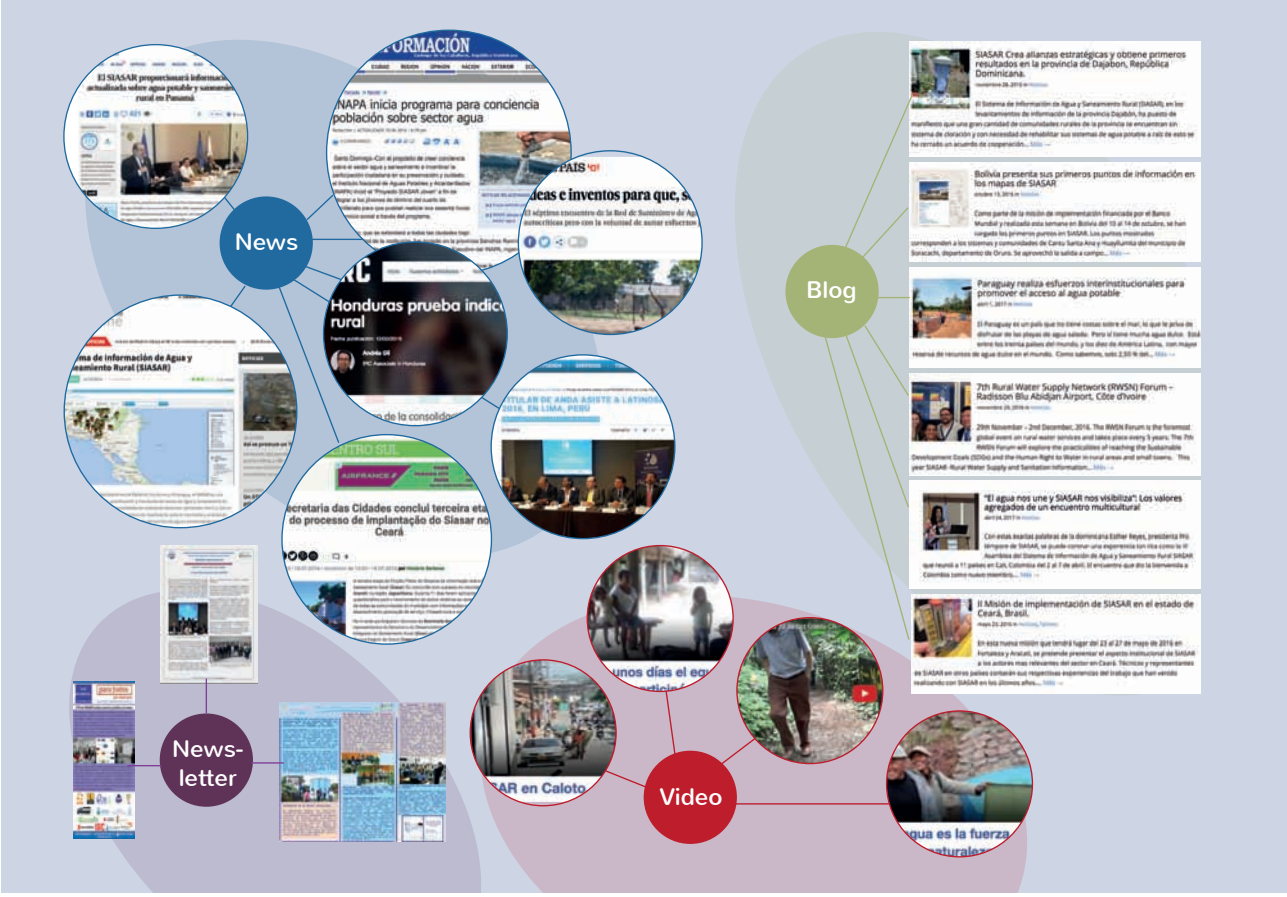


22 http://phonegap.com/
23 http://geoserver.org/
24 http://www.pentaho.com/

3.6.2 Communicating Results

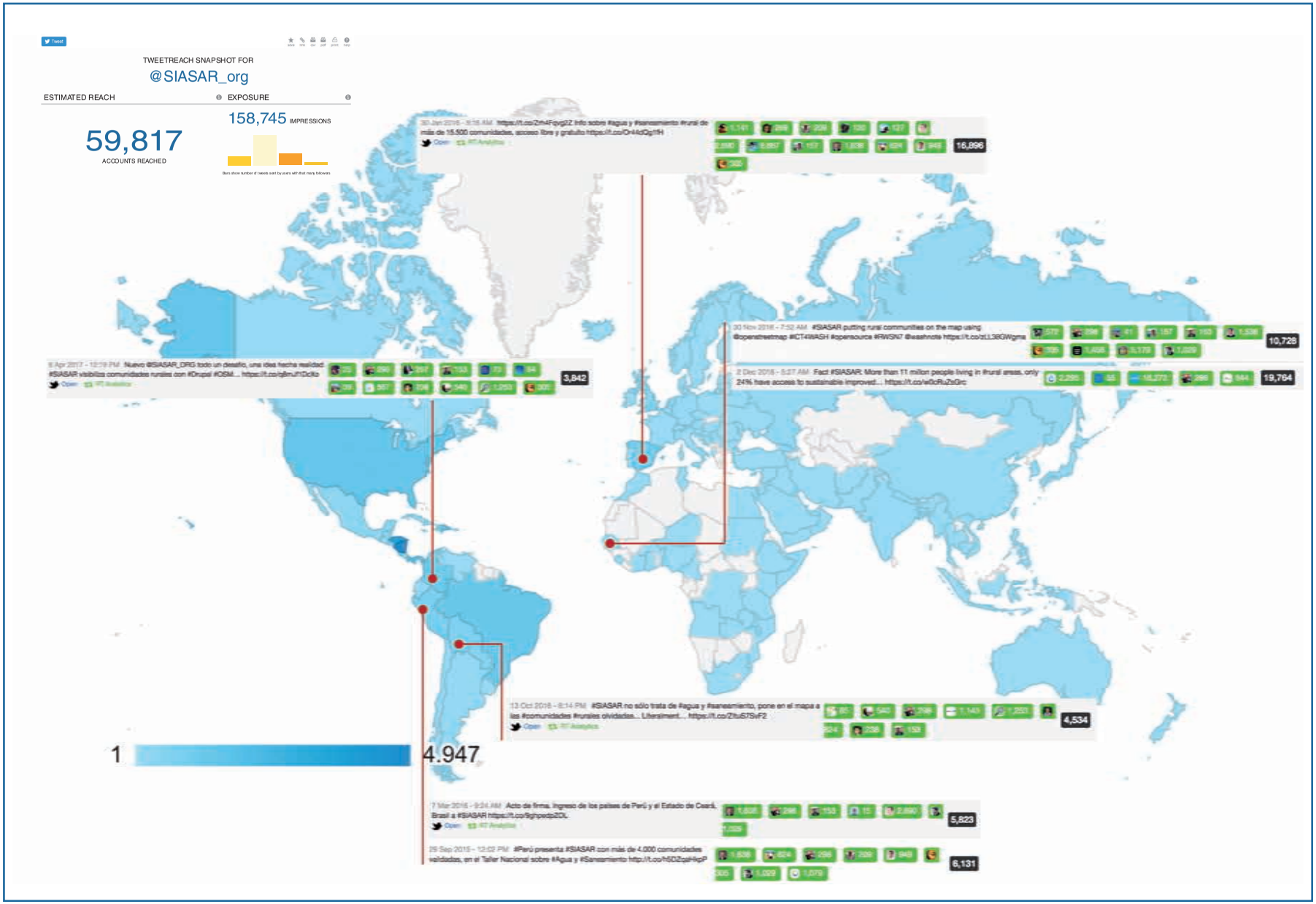
The Regional Communications Group was formerly established in 2016 and is responsible for promoting and advertising the SIASAR initiative, creating quality content and implementing the SIASAR Communication Strategy developed with support from the TA. The initiative currently maintains a public website, blog feed, Facebook page and finally a Twitter account.[25] As a result, SIASAR's visibility, popularity and social media impact have grown exponentially with 590 followers on Facebook, more than 370 followers on Twitter and more than 55 online news articles published in 13 countries. SIASAR's engagement with followers and media exposure is growing with 158,745 Twitter accounts reached in one day and 2,685 users reacting to one Facebook post while online and app-based website traffic from across the globe have also increased.

Figure 11: Press and Media Coverage Across the Globe



25 SIASAR has also received coverage from within the Bank, for example: El reto de llevar agua y saneamiento a toda Centroamérica (http://blogs.worldbank.org/latinamerica/node/9090, Improving the Rural Water and Sanitation Information Systems in Latin America and the Caribbean Region (http://www.worldbank.org/en/results/2017/04/04/improving-rural-water-sanitation-information-systems-latinamerica), and Benchmarking rural water systems by a simple score (http://blogs.worldbank.org/water/benchmarking-rural-water-systems-simple-score).

Figure 12: Social Media Impact Across the Globe



4 SIASAR IN PRACTICE

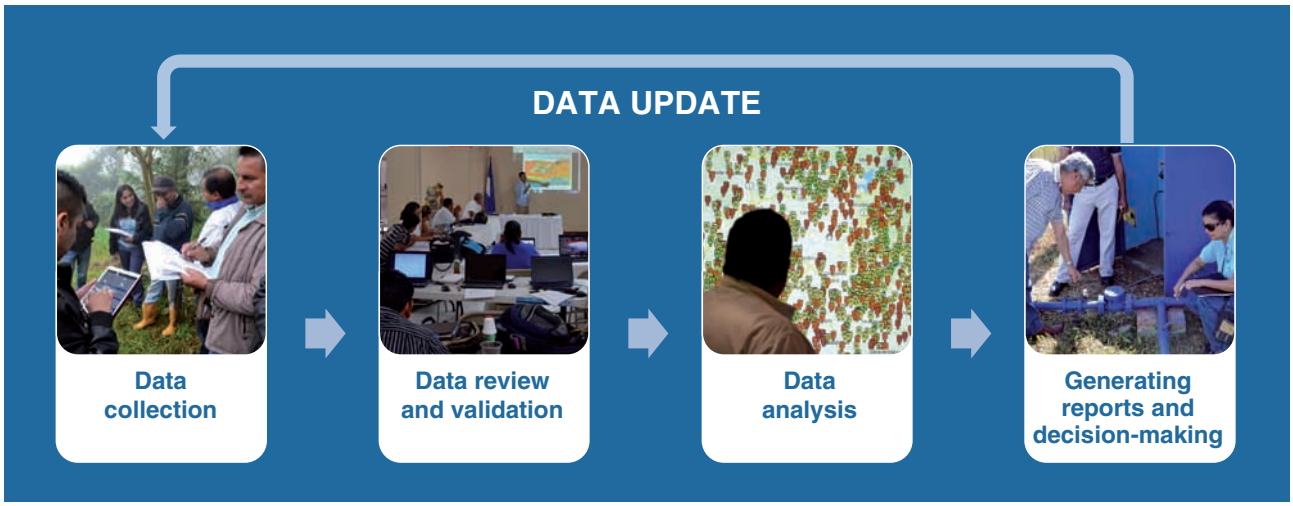
4.1 The Operational Process

A systematic and harmonized approach to data collection and management is critical to ensuring the comparability of data between countries. Data collection[26] is the first step in a series of steps that also includes data review and validation, data analysis, and finally generating reports to support improved decision-making processes (Figure 13).

4.1.1 Data Collection and Update

The basic building block for all data collection activities is the community. Data are collected using four questionnaires corresponding to each of the four entities (Figure 5). Populating the system requires surveying communities, service providers and technical assistance providers, conducting site visits to schools and health centers, and finally

Figure 13: Data Collection and Transformation

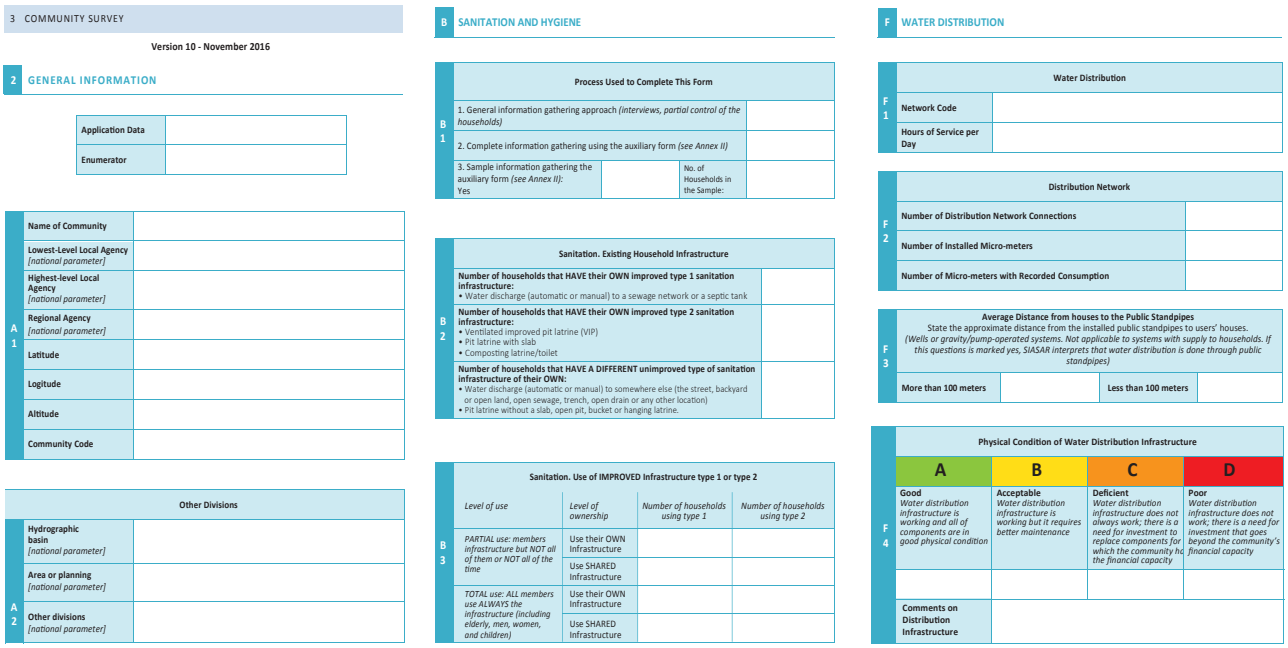


26 Data collection refers equally to baseline data collection activities as well as ongoing updates.

visually inspecting systems. All communities should be surveyed, irrespective of whether or not they have a system or service provider.

Members adhere to a common fieldwork protocol, however, each member designs a data collection strategy tailored to its sector framework and local reality, including adapting the questionnaires to local languages as needed. Data collection activities should form part of community capacity building or technical assistance programs being conducted by the sector. One scheme that has already proven effective entrusts data collection activities to the municipal level while the regional or central level plays a supporting role. In contrast, the lead agency can assume responsibility for all data collection activities, through either local or regional delegates or directly from headquarters. Finally, some members have successfully used students to collect data, a technique that has proven especially beneficial in countries with compulsory social services. Namely, a scheme appropriately known as *SIASAR Joven* (SIASAR Youth) was piloted in Honduras with the support of an NGO that trained senior secondary students to collect data and which was subsequently exported to the Dominican Republic. Senior secondary and university students have also been employed to collect data in Nicaragua where they first undergo intense training and evaluation. Only the top performing students are retained to participate longer term and rewarded with valuable professional experience that culminates in a coveted government reference. Table 5 presents a simplified matrix of the most common data collection schemes employed to date.

Figure 14: SIASAR Questionnaires



3 COMMUNITY SURVEY

Version 10 - November 2016

2 GENERAL INFORMATION

Application Data	
Enumerator	

A 1

Name of Community	
Lowest-Level Local Agency *[national parameter]*	
Highest-level Local Agency *[national parameter]*	
Regional Agency *[national parameter]*	
Latitude	
Logitude	
Altitude	
Community Code	

A 2

Other Divisions	
Hydrographic basin *[national parameter]*	
Area or planning *[national parameter]*	
Other divisions *[national parameter]*	

B SANITATION AND HYGIENE

B 1

Process Used to Complete This Form			
1. General information gathering approach *(interviews, partial control of the households)*			
2. Complete information gathering using the auxiliary form *(see Annex II)*			
3. Sample information gathering the auxiliary form *(see Annex II)*: Yes		No. of Households in the Sample:	

B 2

Sanitation. Existing Household Infrastructure	
Number of households that HAVE their OWN improved type 1 sanitation infrastructure: • Water discharge (automatic or manual) to a sewage network or a septic tank	
Number of households that HAVE their OWN improved type 2 sanitation infrastructure: • Ventilated improved pit latrine (VIP) • Pit latrine with slab • Composting latrine/toilet	
Number of households that HAVE A DIFFERENT unimproved type of sanitation infrastructure of their OWN: • Water discharge (automatic or manual) to somewhere else (the street, backyard or open land, open sewage, trench, open drain or any other location) • Pit latrine without a slab, open pit, bucket or hanging latrine.	

B 3

Sanitation. Use of IMPROVED Infrastructure type 1 or type 2				
Level of use	*Level of ownership*	*Number of households using type 1*	*Number of households using type 2*	
PARTIAL use: members infrastructure but NOT all of them or NOT all of the time	Use their OWN Infrastructure			
	Use SHARED Infrastructure			
TOTAL use: ALL members use ALWAYS the infrastructure (including elderly, men, women, and children)	Use their OWN Infrastructure			
	Use SHARED Infrastructure			

F WATER DISTRIBUTION

F 1

Water Distribution	
Network Code	
Hours of Service per Day	

F 2

Distribution Network	
Number of Distribution Network Connections	
Number of Installed Micro-meters	
Number of Micro-meters with Recorded Consumption	

F 3

Average Distance from houses to the Public Standpipes State the approximate distance from the installed public standpipes to users' houses. *(Wells or gravity/pump-operated systems. Not applicable to systems with supply to households. If this questions is marked yes, SIASAR interprets that water distribution is done through public standpipes)*			
More than 100 meters		Less than 100 meters	

F 4

Physical Condition of Water Distribution Infrastructure			
A	B	C	D
Good *Water distribution infrastructure is working and all of components are in good physical condition*	**Acceptable** *Water distribution infrastructure is working but it requires better maintenance*	**Deficient** *Water distribution infrastructure does not always work; there is a need for investment to replace components for which the community ha the financial capacity*	**Poor** *Water distribution infrastructure does not work; there is a need for investment that goes beyond the community's financial capacity*
Comments on Distribution Infrastructure			

SIASAR uses state of the art technology to facilitate data collection using a mobile app; however, data can also be collected using paper-based surveys. The survey process begins by engaging with the community to ensure their collaboration and participation while the field protocol guides the surveyor through the entire drinking water supply process from source to tap. Beginning with the system, the GPS coordinates of each component of water supply infrastructure are recorded, flow is estimated and the amount of residual chlorine in the network measured. If possible, water samples are also collected for further analysis. Finally, interviewers visually inspect the state of infrastructure with a view to optimizing the system and, above all, improving its long-term sustainability.

Table 5: Commonly Employed Data Collection and Validation Process

Member	Data collection	Data validation	Support	Coordination	Active participation
Bolivia	Local level NGOs	Regional level National level	Regional level National level	National level	National level Regional level Local level NGOs
Ceará	State level (including private firms)	State level	Local level SISAR	State level	National level SISAR
Costa Rica	National level (including private firms)	National level	-	National level	National level
Dominican Republic	National level NGO	National level	-	National level	National level NGO
Honduras	Regional level Local level NGO	National level	Regional level National level NGO	National level	National level Regional level Local level NGO
Nicaragua	Local level	Regional level	Regional level National level	National level	National level Regional level Local level
Oaxaca	Regional level	State level		State level	National level
Panama	Regional level National level	National level	-	National level	National level
Peru	Local level (Including private consultants)	National level		National level	National level Local level

Once in the community, the local water committee or community water board is interviewed to collect data on service provision, and when applicable, supporting documentation must be provided. At the same time, basic community data are reviewed with local authorities. With respect to sanitation and hygiene, there are two options for data collection: interviewing community leaders and the service provider or surveying a representative sample of households within the community. In the case of the latter, a specific protocol and auxiliary form have been designed to facilitate the process. Finally, site visits to the water and sanitation facilities of any schools and health centers are conducted.

Table 6: Estimated Time Required for Data Collection Activities

Community typology	Average time (hours)
Without improved drinking water supply or service provider	1 -2
With improved drinking water supply and service provider	4 – 8 (varies according and complexity and distance to source)
Technical assistance provider	1

BOX 2: Incentivizing Data Collection Activities in Peru

Peru offers an instructive example of linking data collection to fiscal incentives at the municipal level. The country's recently created Ministry of Development and Social Inclusion has been experimenting with various approaches to tie national transfers to municipal government performance. One incentive scheme entails transfers to municipalities based on municipal collection of data to be included in SIASAR. Within four months of the launch of the scheme, some 40,000 communities collected data for inclusion in SIASAR. Data are still being validated and cleaned before publication, though once published this will represent the single largest concentration of communities to date. This innovative approach to data collection sidesteps the traditional model of sending consultants from community to community to gather data, resulting in a potentially significant reduction in costs per community. At the same time, the incentive structure places a greater burden for quality control on the national government to ensure that municipalities accurately report data.

Technical assistance providers are typically interviewed in their normal place of business, for example municipal offices, which are generally conducted by lead sector agencies, such as FISE in Nicaragua or the Ministry of Environment and Water in Bolivia.

Finally, data collection must continue throughout the system's lifecycle and routine updates are critical to understanding longitudinal trends. Updates are facilitated through the use of mobile technology and the interconnectivity of SIASAR's tools by ensuring data collection teams have easy access to previously collected data at all times enabling the quick review and update of individual data fields as needed involving significantly less effort and less financial commitments. As of 2017, only Nicaragua has begun the updating process at the national level, although some municipalities and NGOs in Honduras and the Dominican Republic are also preparing updates of specific information at the community level.

4.1.2 Data review and validation

Following the data collection process, data are reviewed for quality assurance and quality control (QA/QC) prior to publication. This step is crucial to ensure the reliability of information and must be carried out by knowledgeable sector specialists.

The validation process typically takes less than an hour per community, provided any problems can be resolved by consulting the data collection team or by contacting the interviewee directly. In the case of more serious problems or if there is a lack of critical information, field verification may be necessary, delaying the validation process. Some countries have additional mechanisms to strengthen the validation process. Such is the case in Nicaragua where municipal workshops are conducted and data are reviewed jointly with municipal staff and certified directly by the mayor.

QA/QC mechanisms are continuously being improved and include:

- Automatic checks and balances: SIASAR includes a series of automatic checks and balances to guide the data collection and validation process minimizing errors
- Restricted access: access to the database is restricted to registered users and SIASAR actively monitors each user's activity ensuring potential errors in data collection are tracked
- Public disclosure: knowing anyone can review the information and report inaccuracies encourages accurate data collection

4.1.3 Generating indicators, maps and reports

- Once data have been reviewed and validated, SIASAR automatically processes the data to generate indices, indicators, reports and maps at which point data are disclosed to the public. The results are presented in a simple and concise manner, ensuring their accessibility by everyone. Data can be accessed and visualized in several ways:
- Maps: users can create customized maps according to pre-defined options while basic indices support the interpretation of data.
- Reports: There are three types of reports in SIASAR: a list of data, indicators or indices by community or region and automatically generated reports pre-defined by each member based on the needs of local institutions. SIASAR 2.0 includes a new set of tools that will allow users to build customized reports through the website.
- Downloading data: data can be directly downloaded in multiple formats e.g. Word, PDF, Excel, .csv, enabling allows to analyze data as needed.

SIASAR's primary objective is to facilitate decision-making from improving the provision of technical assistance to ultimately improving service delivery and promoting the long-term sustainability of rural water supply and sanitation services. The dissemination of information to primary beneficiaries, specifically, communities and technical assistance providers should be prioritized and ideally combined with capacity building programs. In this context, members are currently establishing mechanisms to ensure communities and technical service providers receive timely information and are empowered to act (see Section 4.3). A more detailed explanation of SIASAR's technology and tools is presented in Section 3.6.

Figure 15: The WSP Index

SIASAR - Sistema de Información de Agua y Saneamiento Rural

junio 12, 2017 - 11:50

Tabla Síntesis de Nivel de Servicios de Agua

Brasil

Cear - Aracati

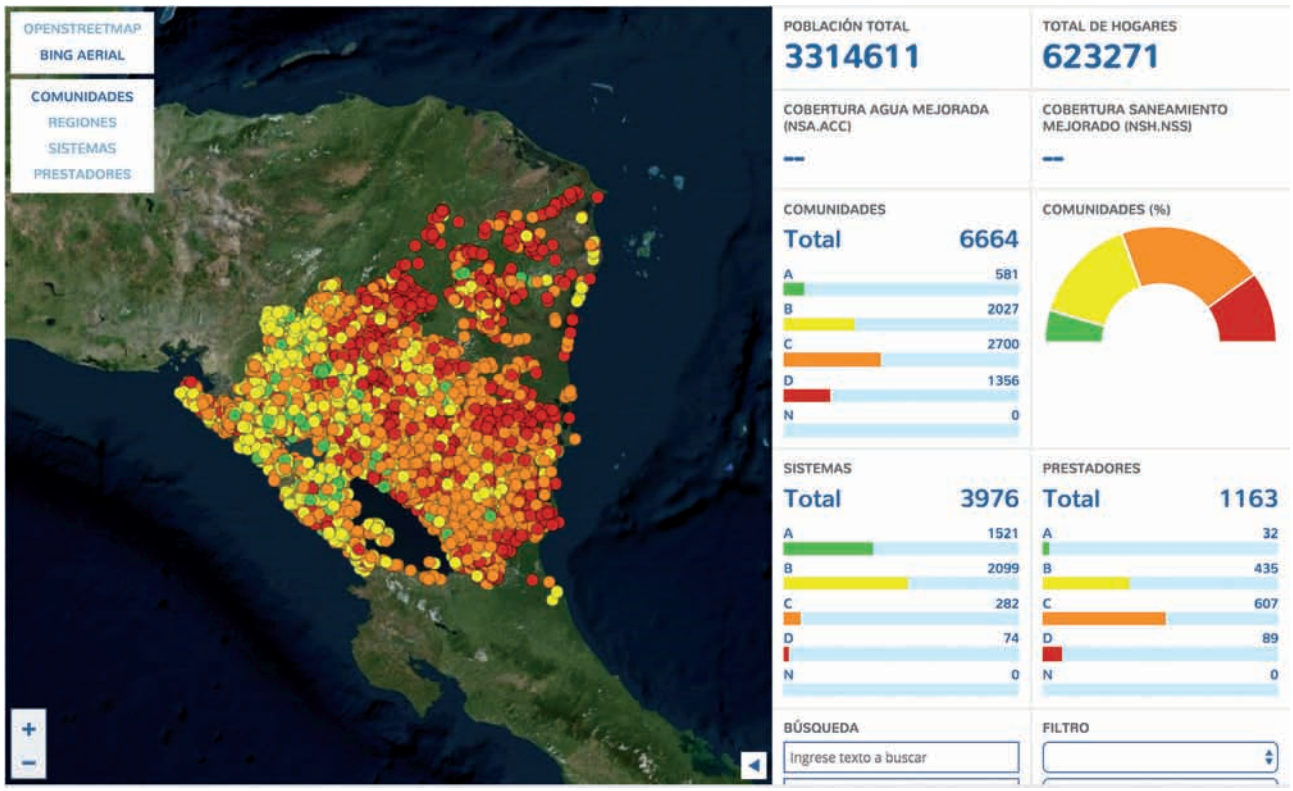
SIASAR

Nombre de la Comunidad	Poblacin	Viviendas	Horas de Servicio as Da	Caudal de los Sistemas	Cantidad de Sistemas con Cloro Residual Adecuado	Cantidad de Viviendas que Pasa Prueba Fisico Quimicos	Cantidad de Viviendas que Pasa Prueba Bacteriologicos	NSA
ALBUQUERQUE	440	115	24	17	0	0	0	D
AREIAS	40	10	24	0	0	0	0	B
AROEIRAS	460	115	-	0	0	0	0	C
ASSENTAMENTO CAMPOS VERDES	608	152	24	0	0	0	0	B
ASSENTAMENTO PORTO JOSE ALVES	1.600	400	24	17	0	0	0	D
BOCA DO FORNO	820	205	9	9	102	102	0	C
CABREIRO	540	135	24	13	0	0	0	D
CACIMBA FUNDA	2.880	720	24	56	650	650	650	C
CANOA QUEBRADA	2.800	689	24	0	0	0	0	B
CANTINHO DE CIMA	869	230	-	0	0	0	0	C
CARAO	100	25	4	0	0	0	0	D
COHAB	815	348	12	0	0	0	0	C
CRREGO DA INVEJA	280	70	24	17	0	0	0	D
CRREGO DA NICA	480	120	24	0	0	0	0	B
CRREGO DO RETIRO	986	268	-	1,81	0	0	0	D
CRREGO DOS FERNANDES	1.220	320	24	17,9	0	0	0	C
CRREGO DOS MACACOS	260	62	24	14,4	0	0	0	C
CRREGO DOS RODRIGUES	760	271	24	0	0	0	0	B
CROAT	36	9	24	3,2	0	0	0	B
CURRAL DE CIMA	32	8	24	0	0	8	8	-
GAMELEIRA	112	35	-	0,5	0	0	0	D
ILHA DO MEIO	120	30	-	0	0	0	0	C
JIRAU	560	124	24	9	0	0	0	C
KATU VILANY	584	146	12	0	0	0	0	C
LAGOA DA CRUZ E DOS ENCANTOS	272	68	14	0	0	0	0	D
LAGOA DA QUIXABA II	96	24	12	4,6	0	0	0	C
LAGOA DAS CARABAS	352	88	0	0	0	0	0	D
LAGOA DAS PEDRAS	61	27	6	1.400	0	0	0	C
LAGOA DO CEDRO	56	28	24	0	0	0	0	C
LAGOA DO JU	200	53	24	0	0	0	0	C
LAGOA DO MATO	312	78	-	0	0	0	0	C
LAGOA DO PRE	808	202	14	0	0	0	0	D
LAGOA DOS CURRAIS	80	20	24	0	0	0	0	-
LAGOA DOS FERREIRAS	260	65	14	0	0	0	0	D
LAGOA DOS PORCOS	324	81	14	0	0	0	0	D
LAGOA DO TEODSIO	245	77	24	0	0	0	0	C
LAGOA NOVA	140	43	21	0	0	0	0	D
LAGOINHA	120	56	24	0	0	0	0	C
MARJOLNDIA	2.480	620	1	40	0	0	0	C
MATA FRESCA	272	68	-	0	0	0	0	C
MORRINHOS	480	120	-	1.200	0	0	0	D

SIASAR

junio 12, 2017 - 11:50

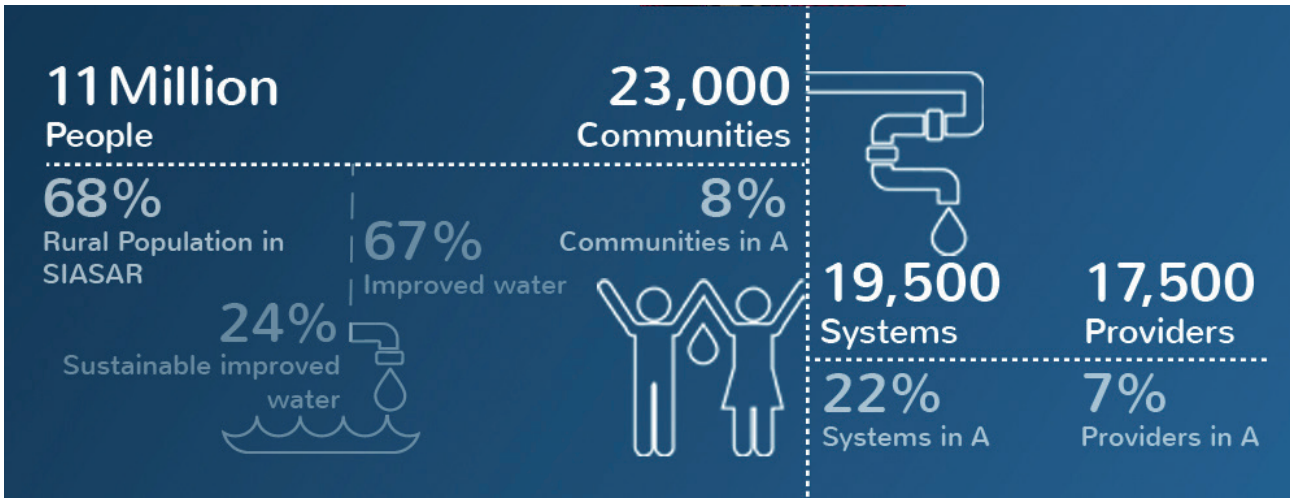
Figure 16: Screenshot of Geo Dashboard for Nicaragua



4.2 Putting rural communities on the map

SIASAR aggregates information collected at the community level to generate important findings that can strategically inform policy and investment decisions to promote the long-term sustainability of rural WSS systems. As more data become available, local and national policy makers are increasingly relying on SIASAR to inform their policy and decision-making processes.

Figure 17: Summary of Data Collected to December 2016



Moreover, by putting rural communities on the map, SIASAR is helping to make an often-invisible sector visible in the planning and investment frameworks at all levels. Incorporating the results of SIASAR into strategic and operational plans is reinforcing the importance, value and relevance of the rural WSS sector and the dedicated professionals who, after witnessing growth in their sector and an increased demand for their services, are developing renewed pride in their work. These impacts are evidenced in the Brazilian State of Ceará, where a dedicated Rural Water and Sanitation Unit, responsible for promoting public policies in rural areas, analyzing and monitoring the sector, and developing projects, was created in 2016.

Eleven members have joined the SIASAR initiative (Table 7) to date, supported by more than 200 national and municipal partner institutions.[27] At present, more than 23,000 rural communities have been entered into SIASAR, covering approximately 19,500 water supply systems serviced by 17,500 service providers. SIASAR coverage data reaches approximately 30 percent of targeted rural communities, amounting to 68 percent of the rural populations of members, or some 11 million people.

27 See Appendix 2 for a full list of projects, institutions and partners.

Table 7: Data Collected to Date (as at March 2017)

Member	Number of Communities							
	Total[28]	Target	Validated[29]					Progress (%)
			2012[30]	2013	2014	2015	2016	
Bolivia	19,179	19,179	-	-	-	-	2	0.1%
Ceará	17,500	17,500	-	-	-	-	90	0.5%
Colombia*	40,000	12,000	-	-	-	-	-	0%
Costa Rica	5,000	5,000	-	-	-	5	5	0.1%
Dominican Republic	10,600	10,600	-	-	257	761	1,034	9.8%
Honduras	28,000	14,000	211	546	1,721	3,319	3,852	27.5%
Nicaragua	7,334	7,334	542	3,998	7,033	7,153	7,334	100.0%
Oaxaca	10,306	4,500				3	26	0.6%
Panama	11,850	4,598	60	300	420	544	1,130	24.6%
Paraguay*	4,300	4,300	-	-	-	-	-	0%
Peru	85,000	35 000	-	-	-	4,143	10,097	28.9%
TOTAL	**238,799**	**134,011**	**813**	**4,844**	**9,431**	**15,928**	**23,570**	**17.6%**

Source: Author's calculations from SIASAR data

**Colombia and Paraguay recently joined the initiative and data collection activities have yet to commence.*

4.3 Showcasing SIASAR

While data are critical to SIASAR's functionality, the substance of SIASAR is in its analytical (decision-making) capabilities. Below are only a few of the more salient examples of how SIASAR is being applied in practice by members.[31]

Nicaragua has made the most progress of all members to date having collected data for all of its rural communities between 2013 and 2015, totaling more than three million people across more than 7 000 communities, and that are now being monitored as part of SIASAR. After completing data collection activities, Nicaragua began adjusting its operations and responding to the needs of the sector identified by SIASAR. To date, **64 municipal rural water and sanitation plans** have been prepared. A diagnostic report is prepared for each municipality visited, including a sustainability chart and budget with technical specifications for any repairs required for each water system that was given a score of "C" or "D". A sustainable service plan is also prepared to provide technical assistance to CAPS as well as training in administration, operation and maintenance of systems.

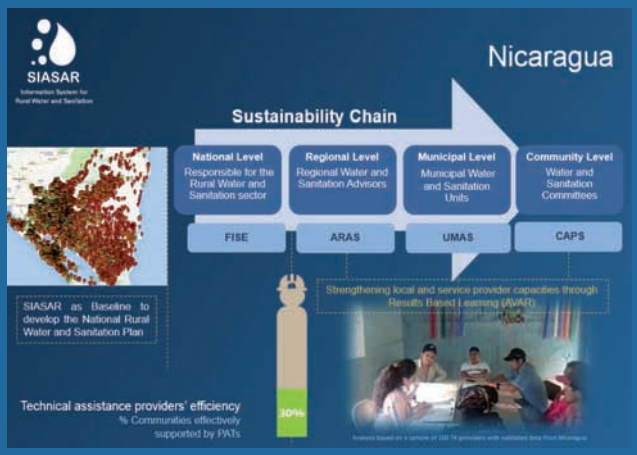
28 Per national institutes of statistics or sector agencies.

29 Data have been collected in 83,952 communities to date. The figures in this table represent the number of communities where data have been collected and validated. Where no data exist, the country had yet to begin.

30 In 2012 the validating tool was yet developed, therefore the number of communities equals the number of communities where data were collected.

31 See Annex 2 for detailed country fact sheets.

BOX 3: Rural Water Supply and Sanitation Sustainability Chain in Nicaragua



Each of these communities was visited by the teams responsible for data collection, the Municipal Water and Sanitation Units (UMAS) and the municipal promoters, which form part of the sector's sustainability chain that has been key to SIASAR's success in Nicaragua. UMAS not only collects information for SIASAR but also provides technical assistance to the Potable Water and Sanitation Committees (CAPS), which operate services in rural communities. Regional Water and Sanitation Advisors (ARAS), sector specialists responsible for validating the data and providing technical and social support, support UMAS. Through this approach, the national authority responsible for rural water supply and sanitation (FISE) has consistent access to critical information for decision-making on the entire sector.

Recognizing the importance of service delivery and technical assistance to sustainability, Nicaragua developed a **municipal training program** within its technical assistance strategy for communities. Applying **results-based learning** methods, the program aims to strengthen the capacity of municipalities leading to improved investments and integrated sustainability of rural water and sanitation systems. Results are measured through an increase in the service provision score with "A" being the desired result as well as having identified the mechanisms necessary to maintain the level of service. SIASAR is being used to inform the rural component of several sector strategies and plans, including: the National Rural Water and Sanitation Plan, the National Water Resources Plan and the Adaptation to Climate Change Project.

In **Honduras**, in accordance with the SIASAR Regulations, the National SIASAR Committee was formally created in May 2014, the first of such Committees to be created. This committee is tasked with assisting the implementation, updating, development and management of SIASAR within the country or region, which assisted the Government in developing profiles on the status of rural WSS services in 28 municipalities based on SIASAR to target technical assistance activities and inform Municipal Development Plans. These municipal Development Plans are an instrument used by Honduran municipalities to formally request the transfer of national funds for local investments. By incorporating data from SIASAR, municipalities were able to evidence their needs and strengthen their case to the national government for greater capital investments.

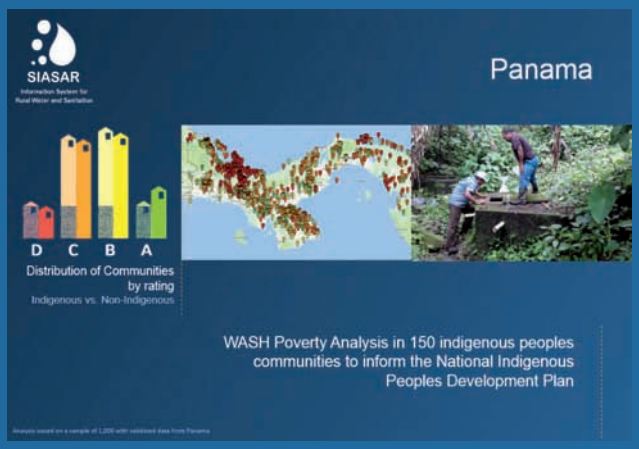
Dominican Republic SIASAR expanded to the Dominican Republic in January 2014 where the Executing Unit for Rural Aqueducts (UEAR) of the National Institute of Potable Water and Sewerage (INAPA) assumed its strategic and operational leadership mobilizing their own resources to conduct pilot projects throughout 2014. At the time, UEAR didn't have an information system or the operational capacity to fulfill its technical assistance functions for the estimated 3,000 rural aqueducts in the country. After witnessing SIASAR's capabilities,[32] several teams were set up within UEAR to collect data and coordinate with other actors in the sector, especially NGOs and INAPA, to leverage the need for operational and financial support e.g. vehicles and fuel to rollout SIASAR. Supported by the national water authority, the Dominican Republic has been using SIASAR to identify and recover systems in need of repair and providers in need of assistance (see Box 4).

32 In 2015, a representative sample of rural communities in the provinces of Dajabón and Elías Piña bordering Haiti was evaluated, to better understand the problems afflicting community WSS services in those areas. In 2016, full baselines were completed for the provinces of Dajabón and San Juan.

BOX 4: Improving Technical Assistance in the Dominican Republic

After using SIASAR to evaluate 105 communities in San Pedro de Macorís **36 water systems were rehabilitated** in coordination with the NGO La Finca repairing leaks and structural problems disinfecting tanks wells and networks and analyzing water quality. In addition four new systems were designed one of which is already being implemented with the support of a local NGO. Approximately 12 000 people have benefitted from these improvements. In the province of Dajabón multiple interventions have been undertaken as a result of SIASAR: (i) **eight new community service providers were created** (known as ASOCAR in the Dominican Republic) in communities with existing systems but without formal provision benefitting 2,285 people; (ii) in the Yaque del Norte river basin **nine project profiles have been prepared** and an ACOSAR created for each benefiting 5,010 people. Finally, **40 chlorine dispensers were installed** in water supply systems where SIASAR identified they had been missing or non-operational. In Elías Piña, the Red Cross used information from SIASAR to **prioritize the execution of projects** in 2016 identifying four systems one of which is already under construction.

BOX 5: Targeting Investments to Indigenous Peoples



The Government of **Panama** is using SIASAR to better direct investments and technical assistance to indigenous communities. The National Indigenous Peoples Integrated Development Plan guides the transfer of resources from the Ministry of Governance to indigenous communities, traditionally, developed by the longstanding Indigenous Roundtable. The Government used SIASAR to collect a representative sample of WSS services from 150 indigenous communities and is now in the process of analyzing this data to generate evidence about the status of services, investment needs, and TA requirements in these areas. These data are facilitating evidence-based dialogue at the Indigenous Roundtable.[33]

33 This initiative was implemented as part of the World Bank financed technical assistance "Country Water Supply, Sanitation, and Hygiene (WASH) Poverty Diagnostic in Panama" (P150563) and was completed in June 2017.

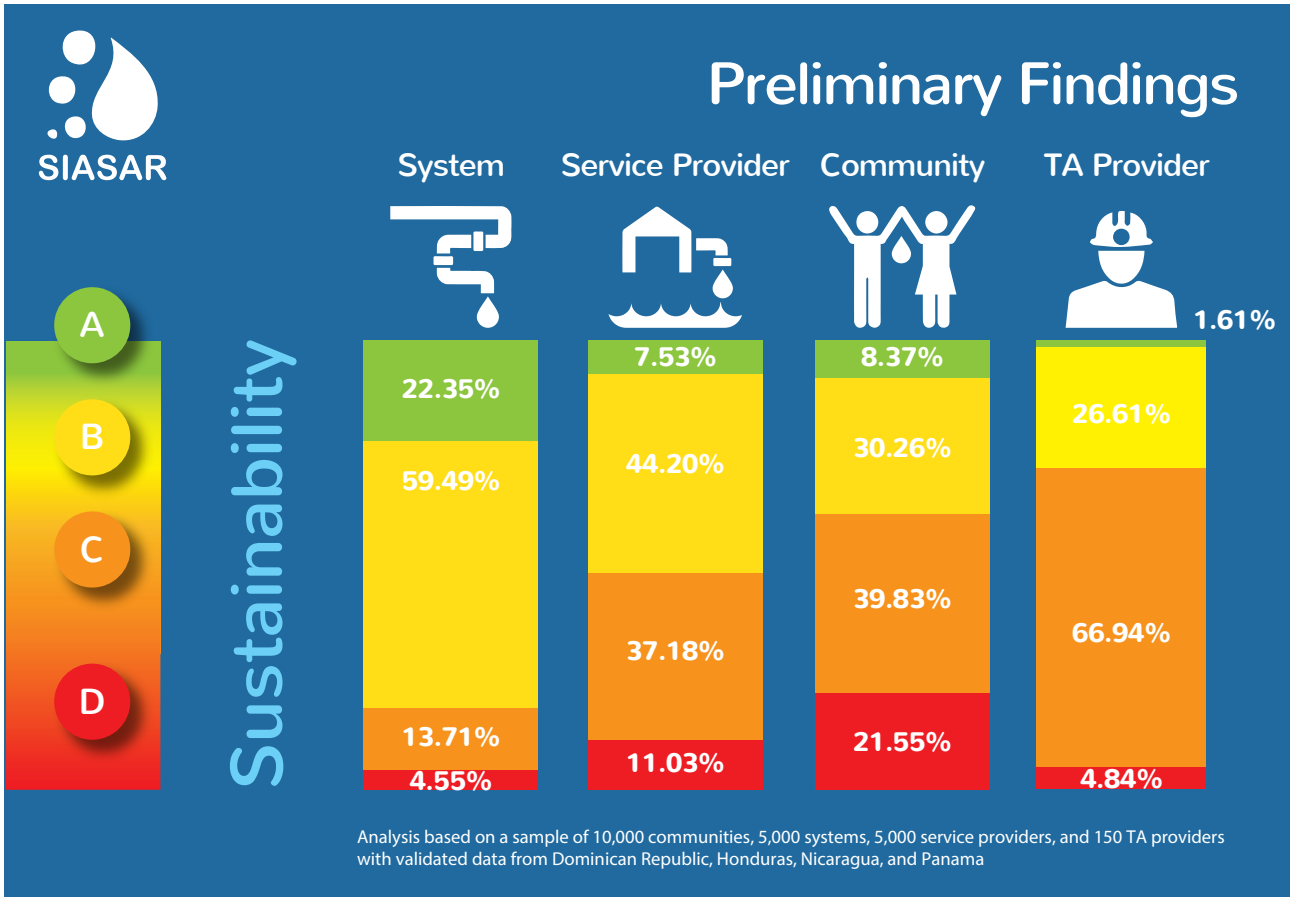
Brazil (Ceará) The State of Ceará had already developed and implemented a highly successful rural WSS management model (SISAR) yet lacked an information system thus their integration into SIASAR in 2016 was opportune. The first SIASAR pilot was developed in the municipality of Aracati, collecting data from approximately 100 rural communities, serving to create a map of rural water and sanitation needs and informing the municipal development plan, the first time a municipal plan in the region has included innovative, rural components. This pilot has paved the way for a second survey using SIASAR and that will inform municipal plans in 10 other municipalities.

4.4 Evidence-Based Research

4.4.1 Preliminary Findings

Analyzing data from the universe of communities registered in the system offers additional insights into the reality of rural WSS that complements coverage data.[34] Specifically, SIASAR provides a snapshot of the current status of WSS systems, providers, and communities, and factors that contribute positively or negatively to the sustainability of WSS services over time. Importantly, data gathered using SIASAR offer a disconcerting picture of the sustainability of rural WSS services provided in communities.

Figure 18: Water and Sanitation Performance Index (WSI).



Source: author's calculations from SIASAR data.

34 Rodriguez and Pena Weiss, 2016. The "Rural Water Supply and Sanitation Information System" (SIASAR) – Addressing Sustainability Gaps Through Visual Data in Latin America, presented at the 7th Rural Water Supply Network Forum 2016 – Cote d'Ivoire: https://rwsnforum7.files.wordpress.com/2016/11/full_paper_0252_submitter_0308_vargas_ramirez_miguel.pdf.

Communities. When looking at the community level index, which aggregates indicators from the system and service provider level, we observe a similarity of the community level classification distribution with that of service providers. Only 8 percent of communities have achieved a classification of "A" as shown in Figure 18. Fully 60 percent of communities fall in categories "C" or "D," suggesting a relationship between the sustainability of the service providers and of the WSS service they are tasked with delivering—stronger service providers deliver more sustainable service.

Service Providers. Similarly, only 7 percent of service providers are in the "A" bracket, while 44 percent face issues that they can resolve on their own, landing them in category "B." On the other hand nearly 60 percent of service providers have been assessed to need outside technical assistance or financial support. 11 percent of rural communities lack a service provider, those in category "D," and 37 percent have a service provider face problems that exceed their capacities. Taken together with the data above on WSS systems, this suggests that there is not only a need for technical assistance for the maintenance and upkeep of systems, but, moreover, there a need exists to provide support to service providers to ensure that they can sustainability manage those existing systems.

Systems: Twenty-two percent of systems are classified as category "A" thus fully functional and considered sustainable. A further 59 percent of systems have been classified as category "B" encompassing systems in need of repair, but within the community's capacity. Conversely, some 18 percent of systems have been classified as category "C" or "D," suggesting the system is on the verge of failure or is completely offline and repairs are beyond the community's capacity. The corresponding maps indicate where systems are failing and where they are performing well, and point to spatial trends that could inform policymaking.

These data contrast with the headline figures for access to drinking water services and sanitation. Reports indicate[35] that approximately 84 percent of the rural population in countries where SIASAR is in use has access to an improved drinking water source. Of that 84 percent, however, SIASAR indicate that only 45 percent of the systems they rely on deliver sustainable services. Thus, without effective maintenance, technical assistance, and financing, the gains made to expand WSS services are at stake.

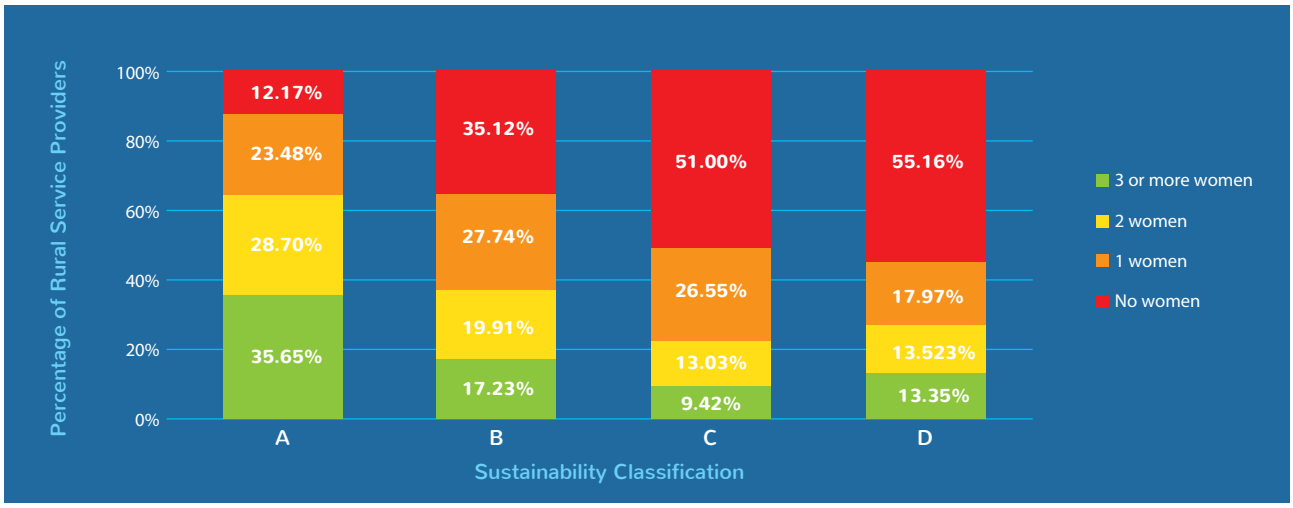
4.4.2 Leveraging SIASAR Data for Sustainable Service Provision

Digging deeper into the single and cross-country data, factors that contribute to sustainability of WSS systems have begun to emerge and inform the policy-making process. This section presents a series of findings from analysis undertaken by the authors. The open source database enables citizens, policy makers, researchers and academics, the media, NGOs, and others to build custom analytical work and in doing so expand the knowledge base. The analytical agenda, led by UPC, was launched during the final stages of the TA. Nevertheless, initial findings, including on gender, suggest that analysis of the data gathered through the SIASAR initiative will be highly relevant in the policy dialogue.

Gender. Female participation in the administration of public services is thought to improve service quality. Data in the SIASAR system allows us to begin to test this hypothesis in the WSS service context. At this point we cannot state that having women participating in community WSS service provider administrative boards guarantees service sustainability. Data from the SIASAR system indicate no substantial difference in sustainability between service providers with a male or a female president. Nevertheless, Figure 19 shows a positive correlation between the number of women on the board and service sustainability: Category "A" service providers have higher percentages of women board members. In sum, greater female participation in water board management appears to translate to more sustainable service. Further analytical work is underway to better understand how the different roles of female board members factor into sustainability.

35 JMP, 2015

Figure 19: Service Provider Sustainability and Female Participation



Source: author's calculations from SIASAR data.

4.4.3 Research Agenda

To further evaluate the robustness, reliability and applicability of SIASAR a rigorous research agenda supported by the TA is currently underway. Although preliminary, initial findings confirm the need to shift emphasis away from building new infrastructure toward ensuring reliability of service provision. Moreover, they highlight the importance of behavioral as well as institutional interventions, to encourage the uptake of safe water management practices, not just on behalf of the service provider, but also the community as whole.

Specifically, researchers[36] performed a Principle Components Analysis (PCA) of data collected in Nicaragua, Honduras and the Dominican Republic using SIASAR with a view to explaining the variability of a water system's sustainability. While analyses are ongoing, key findings include:

- The key drivers affecting the sustainability of rural WSS services are related to the service provider's organizational ability and in particular their capacity to implement proper environmental protection mechanisms; and
- Community hygiene and sanitation followed by water treatment and water quality drive sustainability.

In addition preliminary findings were presented at the 7th Rural Water Supply Network Forum (RWSN) in the Ivory Coast in 2016 where presenters effectively demonstrated SIASAR's capacity to address common challenges faced by the rural WSS sector globally and SIASAR was well-received generating interest among conference participants.

Finally, one journal article has been selected for publication in the Journal of Water Practice and Technology. This article[37] presents SIASAR's comprehensive framework for data collection, analysis and dissemination from the viewpoint of stakeholder involvement. This peer-reviewed paper illustrates how SIASAR represents a suitable monitoring framework to analyze sustainable services and the level of service delivered while highlighting some of the advantages of adopting a continued participatory approach in system development, including: (i) the stimulation of experience exchange and knowledge sharing between recipient countries; (ii) the promotion of learning-by-doing; and (iii) an increase of regional understanding, collaboration and comparisons.

36 Perez-Foguet et al. In progress.

37 Requejo-Castro et al. Forthcoming.

5 PERFORMANCE AND EFFICIENCY IN IMPLEMENTING TA

5.1 Activity Performance

SIASAR's success has exceeded expectations; most of the intermediate outcomes were achieved or surpassed. Specifically, the TA supported the adoption of SIASAR by FOCARD-APS as the information system of choice for the rural WSS sector firmly establishing SIASAR in Central America while expanding regionally. Additionally, SIASAR has been embedded in the sector frameworks of participating members and used to mobilize financial and technical support from NGOs, consolidating its role as an inter-institutional tool. The level of member participation, national and regional NGOs and stakeholder interest, has been high and assemblies have contributed significantly to cultivating collaboration and knowledge transfer between members. The TA supported the expansion of SIASAR to several new members and the Bank played a significant role in this process by supporting coordinating activities and providing technical and financial assistance. Moreover, the Bank has successfully supported the widespread dissemination of SIASAR through its participation in regional and global forums, such as World Water Week and RWSN. Finally, the TA has provided essential support to improving SIASAR's technological content and usability for decision-making while ensuring its integrity as demonstrated by preliminary research activities. Table 8 presents a summary of the technical assistance activity performance and key achievements:

Table 8: Summary of Intermediate Outcomes and Indicators

Indicator(s)	Baseline Value	Target	Value Achieved
Intermediate Outcome 1: Development financing informed			
Rating: 8 – Effective	**Rationale:** One of SIASAR's main objectives is to serve decision-making in the sector by supporting the monitoring and diagnosis of rural WSS services. This has been achieved by using SIASAR in donor-supported operations throughout LAC. Specifically, SIASAR has been used in 13 World Bank operations to: conduct country surveys and prioritize investments in Nicaragua; develop statistically representative samples for future operations in Bolivia and Panama; support an impact assessment and analysis of results in Nicaragua and Panama; and strengthen the capacities of sector agencies in in Oaxaca, Ceará, Nicaragua and Colombia. The number of World Bank lending operations that will rely on SIASAR suggests the initiative is valued within the region.[38] Other donors have also begun to use SIASAR to inform decision-making and prioritize investments e.g. the IDB and AECID in Honduras and Panama.		

Continue

38 For example, SIASAR was showcased in Results in the Latin America & Caribbean Region 2017 (Volume 9), accessible here.

Indicator(s)	Baseline Value	Target	Value Achieved
IO Indicator 1.1	**Number of new operation(s) informed by SIASAR**		
Value	**0**	**2**	**7**
Comments	The preparation of seven operations has been informed by SIASAR: • Nicaragua - Sustainable Rural Water Supply and Sanitation Sector – PROSARS (P147006, US$30 million IDA Credit) • Mexico - Oaxaca Water and Sanitation Sector Modernization - MAS (P145578, US$55 million PforR) • Panama - Second Shared Prosperity Development Policy Loan (P154819, US$300 million DPF) • Panama - Indigenous Peoples Integral Development - (P157575) • Brazil - Paraiba Sustainable Rural Development - (P147158) • Colombia - Enhancing Waterway Connectivity and Water Service Provision in Colombia's Plan Pacifico (P156880, US$40 million IPF) • Bolivia - Rural Water and Energy Access Project - (P161731)		
IO Indicator 1.2	**Number of existing operation(s) informed by SIASAR**		
Value	**3**	**3**	**7**
Comments	The following existing operations were informed by SIASAR: • Nicaragua - Rural Water Supply and Sanitation Project - PRASNICA (P106283) • Honduras - Rural Infrastructure Project - PIR (P08677) • Panama - Water Supply and Sanitation in Low-Income Communities Project - PASAP (P082419) • Brazil - Federal Integrated Water – INTERAGUAS (P112073) • Brazil - Ceará Rural Sustainable Development and Competitiveness - SAO JOSE (P121167) • Paraguay - Water & Sanitation Sector Modernization - PMSAS (P095235) • Colombia - CO Plan PAZcifico: Water Supply and Basic Sanitation Infrastructure and Service Delivery Project (P156239)		
IO Indicator 1.3	**Mobilization of non-Bank resources**		
Value	**0**	**1**	**3**
Comments	The SIASAR initiative has leveraged resources from the following non-bank projects: • IDB: Sanitation and Water Program in Honduras (HND-0007-M) (US$25 million grant from Spain) • AECID: Rural and Indigenous Water and Sanitation Program with Focus on Local Management in Panama (PAN-009-B) (US$5.17 million grant) • CABEI: Co-finance the Program for Rural Water and Sanitation Sustainability in Nicaragua (US$30 million loan)		
IO Indicator 1.4	**Government expenditure informed by SIASAR (number of countries ensuring budget allocation)**		
Value	**3**	**4**	**11**
Comments	Members have a dedicated budget to cover the costs of technical staff and field visits, servers and annual hosting fees. Resources for data collection activities, however, depend on projects and external contributions in the majority of the cases.		

Indicator(s)	Baseline Value	Target	Value Achieved
Intermediate Outcome 2: Policy/strategy informed			
Rating: 7 – Moderately Effective	**Rationale:** Members are incorporating SIASAR into sector policies and plans, but in a disparate way. Where there a clear commitment to SIASAR exists, as is the case in Nicaragua, SIASAR has already informed several national and local plans. In other cases, such as Bolivia or Ceará, where new rural policies are being prepared and strong investments are being made in the sector, the use of SIASAR is considered fundamental in the short and medium term. However, in other contexts where the institutional framework is not as strong or where the sector is under served, SIASAR has had less impact on public policies than sector strategies and planning.		
IO Indicator 2.1	**Number of sector policies informed by SIASAR in each member country or region**		
Value	**0**	**At least 1**	**4**
Comments	SIASAR has been enshrined in sector policy in several countries. For example: • The National Rural Water and Sanitation (2016) and National Water Resource Management (2017) Plans in Nicaragua. • Decree No. 32.024 formalizing the adoption of SIASAR as the Ceará's information system for rural WSS management. • National Water and Sanitation Strategy for the Rural Sector and Small Localities (2017) in Bolivia. • Colombia's National Water and Sanitation Investment System (SINAS) for the implementation of the national policy on water supply and basic sanitation in rural areas established by the National Council for Economic and Social Policy (CONPES 3810 of 2014). Other countries, such as Paraguay, are developing specific decrees or legal instruments to ratify the use of SIASAR as the primary rural WSS sector information system.		
IO Indicator 2.2	**Number of planning tools or decision-making processes designed based on data from SIASAR**		
Value	**0**	**4**	**102**
Comments	102 planning tools/decision-making processes have been developed based on information provided by SIASAR, including: 28 municipal plans in Honduras; the National Water Plan, the National Hydrological Resources Plan, the Climate Change Adaptation Project and 64 rural WSS municipal plans and climate change studies in Nicaragua; the rural WSS National Strategic Plan and the Integrated Development Plan for Indigenous Peoples under preparation in Panama; rural WSS funding proposals in the Dominican Republic and finally one WSS municipal plan in Ceará.		
IO Indicator 2.3	**Number of national and/or subnational institutions supporting the implementation of SIASAR in each member country or region**		
Value	**1 (per country)**	**At least 1 (per country)**	**198**

Continue

Indicator(s)	Baseline Value	Target	Value Achieved
Comments	• 1 Regional: FOCARD-APS • 24 National: Honduras, SANAA, CONASA, ERSAPS; FHIS; Nicaragua, FISE; Panama, DISAPAS, IDAAN, PRONADEL, CONADES; Dominican Republic, INAPA; Costa Rica, AyA; Peru, MVCS, MIDIS; Oaxaca, CEA; Bolivia, VAPSB, SENASBA and AAPS; Colombia, MVCT; Paraguay, DAPSAN, SENASA, ERSSAN; and Ceará, Ciudades, CAGECE and SDA • 173 Subnational: Honduras: AMHON, MANOFM, 4 municipalities; Nicaragua, 153 municipalities; Bolivia, one department and 11 municipalities; and Ceará, one SISAR and one municipality.		
IO Indicator 2.4	**Number of other stakeholder involved in the initiative**		
Value	**3**	**5**	**10**
Comments	UNICEF, IRC and the UPC have collaborated on SIASAR since 2012, while other stakeholders have supported data collection activities or provided technical assistance, for example: Water for People (Honduras and Bolivia); Pure Water for the World (Honduras); Oxfam, La FINCA NGO, Red Cross, Plan Sierra NGO, FUNDASEP (in the Dominican Republic); Peace Corps (Panama).		
Intermediate Outcome 3: Client capacity increased			
Rating: 8 – Effective	**Rationale:** Maintaining SIASAR has been an important challenge for members' without the requisite technological capacity in addition to suffering from high staff turnover. The TA has taken this reality into consideration providing training and support documentation, and opportunities for cross-collaboration where possible. The number of members has almost quadrupled since the beginning of the TA. Responding to the needs of new members has also been challenging and resulted in an increase in financial and human resources above and beyond the initial forecast, which explains the success achieved to date, especially in terms of new members and the number of communities registered in the system.		
IO Indicator 3.1	**Number of countries with SIASAR team established and trained**		
Value	**3**	**4**	**9**
Comments	The TA supported several training and capacity building meetings, specifically: three dedicated IT meetings, three sector and IT training sessions linked to Regional Meetings and Assemblies, six implementation missions with capacity building components, 13 missions with training components, and one communications webinar. Training activities are critical given high staff turnover. At the end of 2016 only 56 percent of original staff remained and Peru and Oaxaca lack fulltime staff dedicated to SIASAR.		
Indicator 3.2	**Number of communities registered in the system**		
Value	**3,969**	**6,000**	**23,570**

Indicator(s)	Baseline Value	Target	Value Achieved
Comments	The baseline value includes communities in Honduras, Nicaragua and the Dominican Republic. The target was estimated based on the participation of four members, but that number was significantly exceeded and in 2016 a total of nine members have input data into SIASAR: Oaxaca, Honduras, Nicaragua, Costa Rica, Panama, the Dominican Republic, Peru, Bolivia and Ceará.		
Indicator 3.3	**Number of countries with detailed roadmaps for future implementation of SIASAR**		
Value	**0**	**At least 3**	**8**
Comments	The TA has supported the following members with the preparation and implementation of their SIASAR roadmap: Oaxaca, the Dominican Republic, Bolivia, and Ceará. The TA also supported the development of roadmaps in El Salvador, Costa Rica, Colombia and Paraguay. Progress has stalled in El Salvador and Costa Rica. Paraguay is progressing slower than anticipated due to a recent change in staff. Colombia recently began the implementation process and is expected to complete the process this year.		
Indicator 3.4	**Number of agreements signed for continued implementation and expansion of SIASAR**		
Value	**0**	**At least 1 regional**	**6**
Comments	A total of 10 out of 11 members have signed the SIASAR Regional Agreement. Five members of FOCARD-APS signed the Regional Agreement in 2014 and five additional members signed regional agreements through December 2016. Paraguay, who recently joined, has not yet signed the agreement, but is participating as an official member.		
Indicator 3.5	**Number of new countries with customized systems**		
Value	**0**	**At least 1**	**8**
Comments	SIASAR has been customized for all eight additional members: Dominican Republic, Costa Rica, Oaxaca (Mexico), Ceará (Brazil), Peru, Colombia, Bolivia, and Paraguay.		
Intermediate Outcome 4: Knowledge deepened			
Rating: 8 – Effective	**Rationale:** As a regional initiative, coordination between members is fundamental. Although work is primarily conducted at a distance, occasional face-to-face meetings are necessary to facilitate strategic decision-making, advance the most critical lines of work and strengthen capacities among teams. As the initiative has grown and results have become available, there has been a strong demand to showcase SIASAR at regional and international forums. The TA has supported the participation of members throughout this process.		
Indicator 4.1	**Number of regional exchanges to facilitate implementation of SIASAR in new countries**		
Value	**0**	**At least 2**	**9**

Continue

Indicator(s)	Baseline Value	Target	Value Achieved
Comments	The following regional exchanges were conducted: • Implementation mission in Dominican Republic (01/2014) with Honduras, Nicaragua and Panama • SIASAR Regional Meeting in Panama (04/2014) with the participation of 8 countries or states • 1st SIASAR Regional Assembly in Honduras (12/2014) with the participation of 9 countries or states • Implementation mission in Oaxaca (04/2015) with Honduras, Nicaragua, Panama and the Dominican Republic • Ceará Technical Exchange in Honduras (11/2015) • 2nd SIASAR Regional Assembly in Peru (03/2016) with the participation of 13 countries or states • Implementation mission in Ceará (05/2016) with Honduras, Costa Rica, Bolivia and Paraiba (Brazil) • Implementation mission in Bolivia (10/2016) with Honduras, Nicaragua, Panama, Costa Rica, Colombia and Paraguay • 3rd SIASAR Regional Assembly in Colombia (04/2017) with the participation of 11 countries or states		
Indicator 4.2	**Number of partner-led pilots implemented**		
Value	**0**	**At least 1**	**4**
Comments	The TA contributed to the development of four pilots to improve the conceptual model and data entry process, and to test the new questionnaires and IT tools, including: • Pilot in Honduras with Water for People in Sula Valle (04/2014) • Pilot in Nicaragua with SDC in Matagalpa and Jinotega (09/2015) • Pilot with Panama regional actors in the municipality of Penonome (09/2015) • Pilot in Ceará in the municipality of Aracati (05/2016)		
Indicator 4.3	**Number of regional and global events in which SIASAR has been presented**		
Value	**0**	**At least 3**	**14**
Comments	SIASAR has been presented in several regional events including: the WASH Sustainability Forum in Amsterdam, Netherlands (06/2014); 1st Rural Water and Sanitation Inter-American Congress in Cuenca, Ecuador, (08/2014); VII ABES Regional Rural Sanitation Seminar in Vitoria, Brazil (11/2014); Rural WSS project for Low Income States in India (http://nnpphedassam.org/), Monitoring and Evaluation Framework International Workshop in New Delhi, India, (03/2015); WB Water Week 2015 (05/2015); 58th ACODAL International Congress in Santa Marta, Colombia (09/2015); IV Latin-American Sanitation Conference LATINOSAN in Lima, Peru, (03/2016); WB Water Week 2016 (04/2016); VIII ABES National Rural Sanitation Seminar in Fortaleza, Brazil (05/2016); Rural Water Supply Regional Event, Bangkok Thailand (05/2016); 7th Rural Water Supply Network Forum 2016 in Abidjan, Ivory Coast (12/2016); and WB Water Week 2017 (03/2017). SIASAR was also presented at the RWSN Mapping and Monitoring Webinar Series (10/2014) and in the RWSN 2016 miniseries (10/2016).		

Indicator(s)	Baseline Value	Target	Value Achieved
I.O. Indicator 4.4	**Number of journal articles and technical documents published**		
Value	**0**	**At least 1**	**4**
Comments	One article has been accepted for publication in the Journal of Water Practice and Technology and a second article is underway. A Technical Brief was published in 2014 and a second one is ready to be published. The 2017 International Sustainable Development Research Society (ISDRS) have accepted two additional articles for presentation and publication.		

5.2 Bank Performance

Table 9: Summary of Bank Performance

Bank Performance	
Areas to be rated	**Rating**
Overall Bank Performance	8 – Effective
Strategic Relevance & Ownership	8 – Effective
Technical Quality	8 – Effective
Client Engagement/Dissemination	9 – Very Effective
Timeliness	7 – Moderately Effective

Comments

SIASAR's rapid expansion is a testament to the Bank's convening power and its strategic relevance, which has been essential to leveraging strategic partnerships, attracting external expertise and creating brand awareness both regionally and globally. Several partners have complimented the Bank's support and the initiative will continue to engage with longstanding strategic partners, such as the IDB and AECID, for overall coordination at the regional level. NGOs including IRC Wash and Water for People will continue supporting local efforts and data collection activities through bilateral agreements with national governments. SIASAR's participatory approach and member-driven implementation process has been critical to cultivating strong ownership and empowering members to increasingly take leadership roles and responsibilities in day-to-day operations. The UPC has played a pivotal role in providing technical expertise to support the strategic direction of the conceptual model and preliminary research attests the high level of technical quality achieved. Moreover, SIASAR is considered relevant as a tool for monitoring the SDGs. SIASAR's reputation has been further cemented by its adoption at the regional level in Central America and the widespread dissemination of results has led to growing interest regionally and globally.

The Bank's support was essential during the initial phase (and to support the development of SIASAR 2.0), and the Bank's convening power has proven to be a positive resource in generating political will, however, it has less reach at the subnational level where SIASAR is implemented in practice. Furthermore, there are currently no accountability mechanisms in place to ensure members meet commitments prescribed in the Regulations potentially affecting the long-term sustainability of SIASAR. The definition and implementation of roadmaps has been met with partial success. While Bolivia, Ceará and Paraguay have all developed, and as necessary, updated their roadmaps, the Dominican Republic and Oaxaca (Mexico) have only developed preliminary implementation plans while Costa Rica, Peru and Colombia have not progressed this activity at all. Consequently, the Bank's current challenge is to empower the membership to ensure ongoing sustainability of the initiative while disengaging from day-to-day operations.

5.3 Cost Overview

5.3.1 SIASAR Initiative Costs

The total estimated cost of the SIASAR regional initiative from FY14 to date is US$2.69 million,[39] of which the Bank provided approximately US$1.83 million from Trust Fund (TF)[40] resources.[41] Members[42] and other donors provided the remaining 32 percent. Importantly, this amount should be weighed against the increasing number of members over time (Figure 20).

Recurring costs for activities such as the General Assembly (average cost US$85,000) and regional coordination meeting have decreased over time as new members and other donors have increased their contributions (Figure 20).

Figure 20: Service Total Costs by Year and Cost Distribution by Institution (FY14 – FY17)

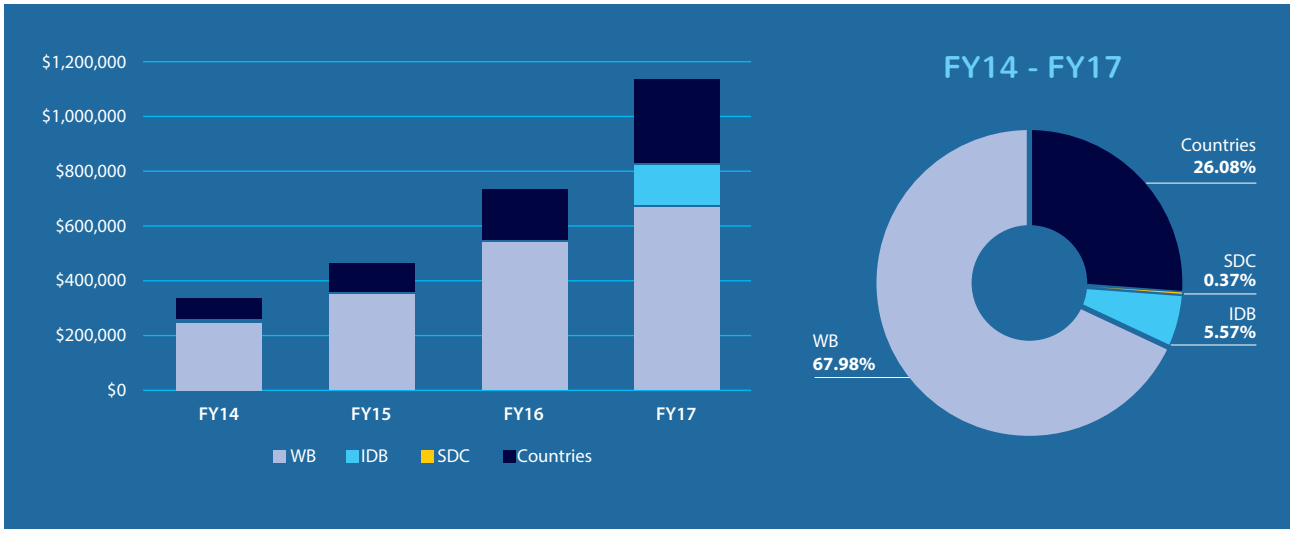
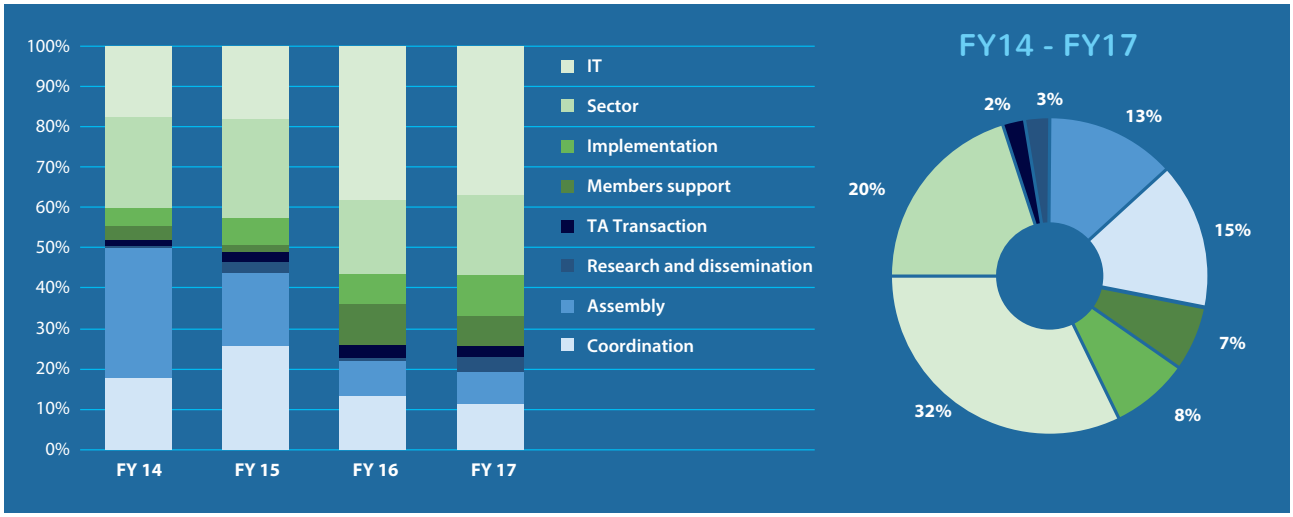


Figure 21: Total Cost Distribution (%) and Distribution of Costs by Type and Year



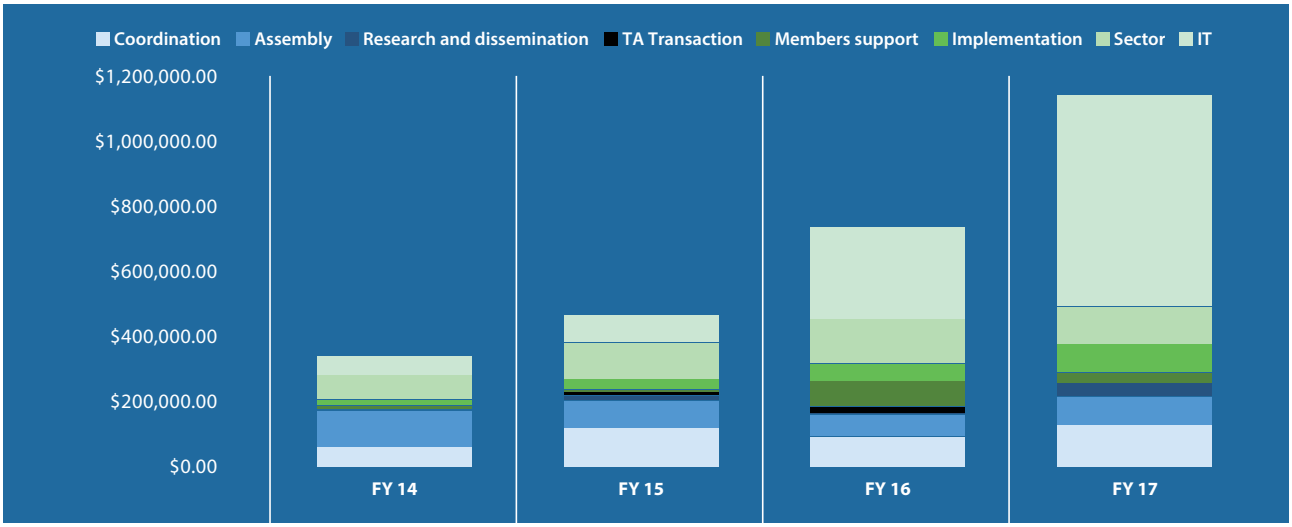
39 Data collection costs were excluded from this analysis, as well as other costs incurred at the national level by each member, such as the acquisition of equipment or internal dissemination costs.

40 Including US$400,000 from Spain's Ministry of Finance and Commerce administered through the SFLAC Trust Fund (FY14-FY16) and US$150,000 from the SDC (FY14-FY16), through the WSP Trust Fund in addition to contributions from other donors.

41 Resources spent as part of Bank-financed operations, such as PRASNICA or PROSASR in Nicaragua and São Jose in Ceará, Brazil are considered expenses incurred by members and were excluded from this analysis.

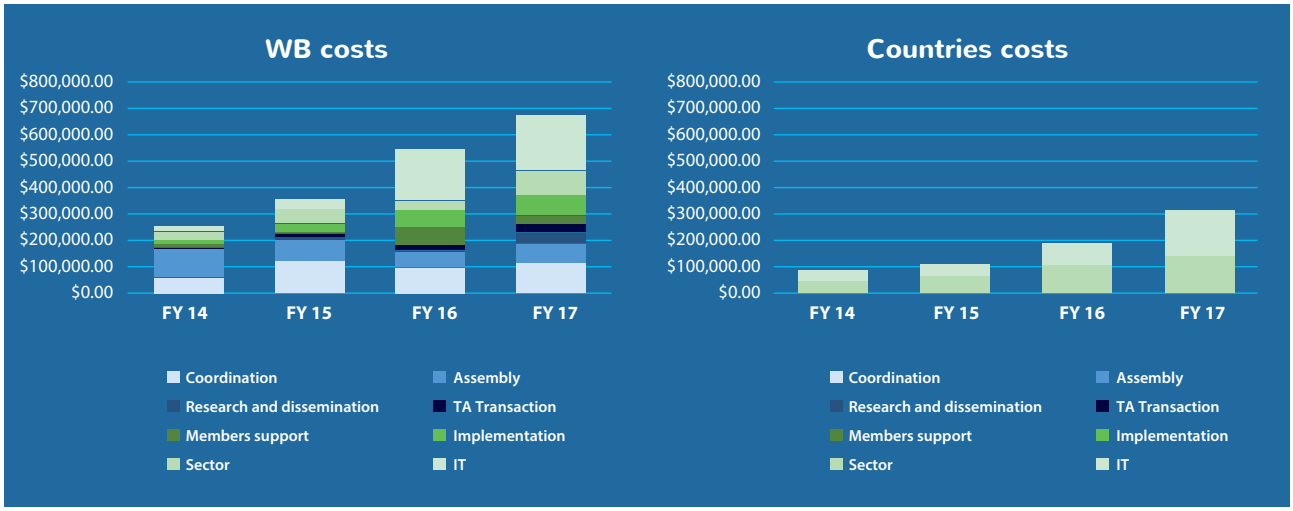
42 Member contributions are estimates based on the time spent of sector and IT teams, as provided by members.

Figure 22: Detailed Costs by Type and Year (FY14 – FY17)



	FY 14	FY 15	FY 16	FY 17
IT milestones	**Review of IT tools**	**SIASAR new website**	**SIASAR 2.0 development began**	**New website**
				New database
				New Apps
				New framework
				New dashboard (maps)
				BI tools (reports)
				Water quality App (in progress)
Sector milestones		SIASAR new index and indicators	SIASAR 2.0 new questionnaires	SIASAR adapted to SDGs
			Portuguese and English versions	New user's manual and field manual
				Dictionary of Terms
Implementation in new countries	Dominican Republic	Oaxaca	Peru	Bolivia
			Costa Rica	Colombia
			Ceará	
Existing members supporting implementation process	Honduras	Honduras	Honduras	Honduras
	Nicaragua	Nicaragua	Nicaragua	Nicaragua
	Panama	Panama	Panama	Panama
	Dominican Republic	Dominican Republic	Dominican Republic	Dominican Republic
		Oaxaca	Oaxaca	Oaxaca
			Costa Rica	Costa Rica
			Peru	Peru
			Ceará	Ceará
				Bolivia
				Colombia
				Paraguay

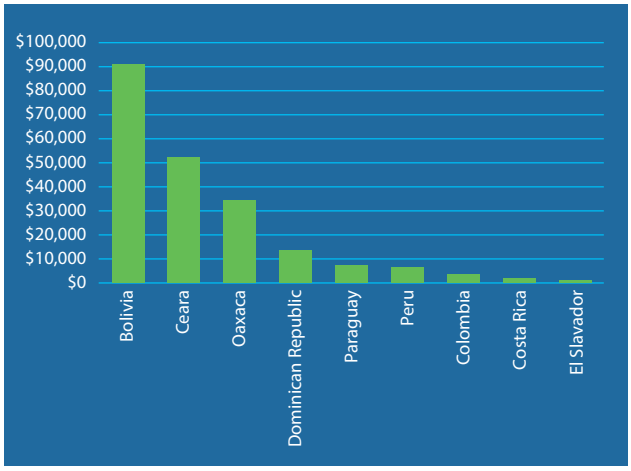
Figure 23: World Bank and Countries Detailed Costs by Type and Year (FY14-FY17)



To the contrary, implementation costs have increased as the initiative has expanded to support more members. The costs of dissemination and research activities have also increased due to targeted efforts to disseminate the initiative in multiple regional and global forums

The increase in sector and IT costs (Figure 22) is related to the development of SIASAR 2.0, launched in April 2017, which led to an increase in external expertise supported by the TA, as well as the expansion of SIASAR, which led to an increase in SIASAR staff whose costs are borne by members in their entirety. The benefits of this extraordinary effort and capital investment in developing a harmonized and robust conceptual model and easy-to-maintain, free IT ecosystem capable of supporting data from more than one hundred million communities[43] will be reaped in the future as fewer resources will be required to consolidate results and to expand the initiative to additional members. Furthermore, this share will decrease dramatically in the coming year, as no further changes are expected in the near future given the conceptual model has been approved, the IT platform is up and running, and members are focused on generating results and mainstreaming SIASAR.

Figure 24: Implementation Costs by Member



The costs of implementation support missions vary with the level of ownership and participation from other members (Figure 24). The average cost ranged from US$45,000, (for new members[44] requiring intensive support and the participation of several members), to US$4,000, (for new members[45] with the existing capacity to take ownership of the process and little need for implementation support from other members).

43 SIASAR 1.0 began having performance problems once data for more than 10,000 communities had been entered into the system and IT specialists estimated the SIASAR 1.0 database could not support more than 100,000 communities.

44 The Dominican Republic, Oaxaca, Ceará, Bolivia and Colombia.

45 Costa Rica and Peru. The process is still ongoing in the case of Paraguay and unfinished in the case of El Salvador.

5.3.2 Data collection and other national costs

Table 10 presents cost estimates for data collection activities in different countries. The average cost per community using SIASAR is estimated to be US$154. These estimates should be interpreted with caution, as they may not represent the reality of other members or even the reality of different regions within each country. However, moving forward these costs are expected to be incorporated into operational and TA activities potentially lowering costs significantly over time.

Table 11 presents estimated costs associated with completing a national baseline limited to members having completed a national baseline or expected to use that approach.

Table 10: Estimated Data Collection Costs by Country

Member	Estimated data collection cost per community*		Source
Nicaragua	Central Region Caribbean South Coast	US$109 US$228	Update data report, FISE (2016)
Honduras	Lepaterique	US$123	Lepaterique Pilot (2012)
Panama	Indigenous territories Non-Indigenous regions	US$222 US$100	Concept Note: Indigenous regions collect data plan (2015)
Dominican Republic		US$50	Dominican Republic SIASAR National Plan (2014)
Bolivia		US$215	Bolivian SIASAR National Implementation Plan (2017)
Ceará	Aracati	US$187	Aracati Pilot (2016)
Average cost per community		**US$154**	

** Including costs for staff, vehicles, fuel, data collection, processing and validation, capacity building and dissemination activities.*

Table 11: Estimated Baseline Costs Per Country

Member	Estimated baseline cost*	Data source
Nicaragua	US$2,000,000	Estimate based on Nicaragua WB Operations information
Bolivia	US$5,503,705	Bolivian SIASAR National Implementation Plan (2017)
Ceará	US$3,587,500	Aracati Pilot (2016)

6 LESSONS LEARNED AND RECOMMENDATIONS

6.1 Guiding Principles

The Guiding Principles are fundamental to the development and implementation process. Adherence to the Guiding Principles throughout successive reviews of the conceptual model has united efforts and ensured a consolidated focus moving forward. Since its original design, subsequent iterations of SIASAR's conceptual model and information system (SIASAR 2.0) have emphasized a harmonized approach while remaining flexible and versatile enough to adapt to differences in rural realities between members and SIASAR's open access platform has facilitated the participation of external stakeholders. Notwithstanding, some members perceive the review and evolution of SIASAR's conceptual model and indicator framework as contrary to the first Guiding Principle to remain simple and finally, although the institutionalization of SIASAR by lead agencies lays the necessary groundwork for its adoption, this top-down approach hasn't necessarily translated into its implementation in practice. Future modifications to the conceptual model need to respect the capacity and threshold for change of participating members while refocusing efforts to include local governments in the implementation process should help contribute to SIASAR's long-term sustainability.

6.2 Data Collection Activities

Putting communities on the map has proven to be an effective way to ensure their inclusion in the planning process. Refining mechanisms to make data relevant to policy makers should encourage sector authorities to gather and maintain current data for use in decision-making processes to improve the sustainability of WSS services, particularly in the furthest afield communities.

Fiscal transfer mechanisms can be used to incentivize data collection activities. The Peruvian model of linking national government transfers to the collection and reporting of data for use in SIASAR creates an interesting incentive for local authorities to report data on WSS systems in their jurisdictions (see Box 2). This model could be taken a step further to 'transfer for results.' In this scheme, national governments could use the change in SIASAR indicators — for instance from category "C" to "B" as a trigger to allocate fiscal resources to a given municipality.

A strong regional presence engenders healthy competition incentivizing SIASAR's uptake. The adoption of SIASAR by Peru, the first Andean country to join SIASAR, proved to be a determining factor in Bolivia's participation. SIASAR's transparency enables members, national governments, media outlets and interested stakeholders to monitor their progress in the regional context. A stronger focus on disseminating achievements could be used as a motivational tool to encourage data collection activities and new membership.

Data collection activities need not be limited to a specific scale. Where countries have not been able to complete widespread data collection activities, mechanisms have been put in place to ensure the

information gathered is useful for decision-making. For example, in Panama the initiative to collect data in indigenous communities began by first designing a statistically representative sample to ensure the pilot of 150 communities accurately reflected the realities of all indigenous peoples within the country. Nonetheless, the lack of a complete national baseline may mask realities at the national scale. Focusing on indigenous communities where sustainable WSS services were already limited served to increase the visibility of historically underserved communities and facilitate evidence-based dialogue at the Indigenous Roundtable in Panama. Efforts to ensure data collection activities are successfully scaled up should be preserved while regional comparisons should be conducted with caution.

Facilitating the transfer of data to SIASAR from existing databases could broaden its appeal. To consolidate itself as a sector standard with a robust and versatile conceptual model, index and operating platform that potential members consider highly useful, SIASAR must allow for data to be captured using different methods and for the model to be populated in different ways. For example, SIASAR's questionnaires remain the most popular option in countries without a comprehensive database; however, countries with an existing database may prefer to migrate their data to SIASAR. This option has been successfully tested in Costa Rica and Peru.[46] Based on these experiences and the expectation this situation will present itself more frequently in the future, SIASAR is poised to become the benchmark conceptual model (front end) of choice. Adapting SIASAR to these situations will require well-defined rules to guide the data migration process and to ensure quality control and compatibility of the input data as well as the collection of any missing data. This approach should be conceived more broadly and not on a member-by-member basis.

Harmonizing indicators has been key to establishing benchmarks for the rural WSS sector. Disparate urban rural classifications affect the reliability of spatial comparisons and hinder inter-agency collaboration. Specifically, rural areas are commonly and simplistically defined as 'not urban' yet the definition of urban varies from country to country, primarily as a factor of population, political administration or even access to basic services.[47] However, because this approach is defined to conform to national statistics and census data requirements, a rural area's smallest unit is a single household. This contrasts with the reality of rural WSS provision. While SIASAR is designed to operate across scales,[48] including individual households, the determination of the management unit is subjective and determined by the lead institution in each member's region. To ensure the continued accuracy and ongoing relevance of regional comparisons, standards should be continually harmonized, especially as new members with variable needs join the initiative.

Delinking system revisions from data collection activities will facilitate the implementation process. Tailoring SIASAR to the specific needs of institutions and strategic partners and staying well informed of global monitoring systems such as the SDGs will ensure SIASAR's use in the future. Members and strategic partners have established mechanisms[49] that, moving forward, will allow data collection activities and day-to-day operations to continue while at the same time improving the conceptual model and its associated IT tools. These mechanisms may need to be reviewed and expanded as the conceptual model evolves to ensure continued relevance moving forward.

6.3 Cultivating a Broader Understanding of Results

Increasing capacity in the rural WSS sector will improve SIASAR's applicability in practice. Sustainability as it applies to the rural WSS sector is a relatively new concept that remains loosely defined. This lack of general consensus makes its application in practice challenging, especially for members who lack the technical know-how needed to tailor the

46 Bespoke data migration processes were designed to accommodate the transfer of data directly into SIASAR and to then extract compatible information for the associated sustainability metrics. While the data migration processes were successful, in order for the indices to be fully populated, both countries would need to design bespoke surveys to collect complementary data required by SIASAR.

47 For example, in Bolivia and Mexico urban areas are defined as conurbations with populations of 2,000 or 2,500 people or more respectively. To the contrary, in Panama and Honduras, an urban population is an area with more than 1,500 or 2,000 people respectively with access to basic services, while in Nicaragua 1,000 people is the defining threshold (CEPAL, 1999).

48 For example, SIASAR is adaptable to rural communities, small towns and small cities.

49 For example: (i) designing and agreeing specific equivalencies between different versions of questionnaires and indicators during annual assemblies thereby ensuring all historical information always remains relevant ("live"); and, (ii) establishing transitional periods between different versions of the model so that countries can better plan their data collection campaigns.

concept to local realities yet sustainability underpins SIASAR's framework. As a result, some members may not have the capacity to fully capitalize on SIASAR's functionality. Moving forward, the SIASAR initiative should continue to support members to generate and analyze reports and conduct research to better understand the factors that contribute to the sustainability of rural WSS services. Engaging stakeholders — from local communities to service provider associations to NGOs to universities — to conduct deep dives into the growing dataset could also help quantify and understand these factors further while disseminating findings to a broader audience.

6.4 Value for Money

Integrating data collection and updates into routine technical assistance could better utilize existing resources allocated to rural communities. As a public good, SIASAR's information system has limited financial outlays and members can effectively hit the ground running. As members move from initial data collection activities to the updating of existing data, fewer resources will be required to maintain high quality results. To this end, the SIASAR initiative intends to build a 'technical assistance roadmap' that indicates regular checkpoints, much in the way a new car comes with a maintenance schedule. The schedule could indicate what kinds of technical assistance would benefit a particular type of community and at what frequency. By following the technical assistance roadmap, service providers — and the governments and donors who support them — should reduce long-term costs by providing technical assistance systematically, rather than on an ad hoc basis.

Virtual workspaces decrease operational costs. Regional assemblies are essential to promote sector ranking and maintain momentum while increasing SIASAR's visibility regionally and globally. The Bank and other donors, including *inter alia* SDC, IDB, AECID, the Spanish Ministry of Economy, the EU, and UNICEF have provided financial and human resources for these events, supported logistics and covered airfares for national sector authorities. However, in-person meetings increase operational costs. The Bank's WebEx system has proven essential to mitigating some of these costs and 31 out of 37 regional working group meetings were conducted at a distance over a three-year period. In addition, GitLAB, SIASAR's collaborative, on-line workspace and management system, has been vital to day-to-day IT management. As the initiative expands regionally and globally, the ongoing commitment to virtual collaborations will become even more critical.

External facilitation continues to be essential to keep members engaged. In 2013 when the Bank experimented with giving member countries a greater degree of responsibility for planning and executing events, a slowdown in participation indicated the Bank still had an important role to play. Such events are costly and members, particularly middle-income countries, are aware they will need to carry more of the financial burden moving forward. Thus far the message has been well received and sector authorities have expressed confidence in their ability to mobilize resources beyond the Bank, due in part to the recognition received from their governments of SIASAR's added value, as well as strong interest from other donors. To facilitate greater autonomy, promote self-sustenance and support SIASAR's long-term sustainability, members (with support from the Bank), should develop a financial strategy and business plan that seeks to increase the financial participation of members and identify alternative sources of funding.

The Regional Agreement promotes stability and continuity across political transitions. The initiative's ability to withstand political uncertainty has withstood the test of time in several countries. For example, during multiple changes in administration in Panama, progress on the SIASAR initiative stalled, at one point for over a year, until the new administration decided to reinitiate the process and in Nicaragua, SIASAR was successfully implemented despite several changes in administration within the lead institution. Had the initiative lacked the institutional momentum defined in the Regional Agreement and promoted through regular in-person meetings, it may not have recovered. Still, it's instructive to recognize where efforts have yet to meet expectations. Peru, for example, was quick to adopt SIASAR exceeding data collection targets more than ten-fold; yet the initiative's implementation has since ground to an unexpected halt. In the case of Oaxaca, Mexico, despite a successful implementation mission, political maneuvering and legal complications between the federal and state governments quickly affected data collection activities[50] that, two years later, have yet

50 The Government of Oaxaca envisioned collecting data from approximately 4,500 communities as part of the World Bank financed Oaxaca Water and Sanitation Sector Modernization Operation Project (P145578) a US$55 million Program-for-Results (PforR) Loan. However, the program's priorities were subsequently modified deemphasizing data collection in rural areas and causing delays in its implementation, in addition to a change in government. As a result, only 24 communities were surveyed.

to recommence. These examples demonstrate the potential consequences of tying data collection activities to external funds. To mitigate these eventualities in the future, active monitoring programs should be established within local and national frameworks. In addition, improved coordination within the Bank could help address any shortcomings tied to Bank operations.

6.5 Understanding the Realities of the Rural WSS Sector

SIASAR's implementation is closely linked to the reality of each member's rural WSS sector. To the extent the initiative's success can be measured by its degree of implementation, it is closely linked to the development of each member's rural WSS sector, which can be classified into three groups: members that have prioritized the sector through clearly defined policies; members without well-defined policies, but a strong institutional presence; and members that lack institutional presence and political will.

Existing capacity improves the likelihood of implementing SIASAR successfully. Where members have prioritized the sector such as Nicaragua, Bolivia, Peru or Ceará, information systems are critical for monitoring progress against specific goals, for example, drinking water coverage or access to improved sanitation. Correspondingly, the rural WSS sector has been strengthened and the capacity needed to integrate SIASAR into the decision-making process or the political will to increase capacity exists. Moreover, in countries where SIASAR has become a proven concept, SIASAR routinely informs the planning process ensuring the government's ongoing support. For example, in the case of Nicaragua, SIASAR's rollout was supported by well-articulated objectives and adequate funding and in the case of Peru, a well-designed incentive scheme.

Political will positively influences implementation outcomes even in the absence of sector policy. In cases where rural WSS policies are not well defined, but where the sector exists alongside a strong presence of rural actors, SIASAR has contributed to the institutional strengthening of the overall sector. Such is the case in Honduras and the Dominican Republic where SIASAR has inspired the sector to surmount historical challenges cultivating new opportunities and leading to improved WSS services. The Dominican Republic is a particularly interesting example as it demonstrates how SIASAR promotes a better understanding of local realities and has led to the creation of a series of mechanisms to support rural communities both technically and socially while promoting stronger coordination between public agencies and NGOs. To some extent, Honduras has experienced a similar renaissance through improved coordination with NGOs, and the regional and local entities often responsible for data collection activities and participating in sector discussions at the highest level.

Limited institutional strength impedes the implementation process. Finally, where public policies are sorely lacking and there is limited institutional support for the rural WSS sector, SIASAR's implementation has not progressed significantly, for example in Oaxaca. However, it's worth noting the opportunity to participate remains open independent of a particular member's progress.

Thus it would appear SIASAR's success is contingent upon strong political will, a clearly defined vision and the appropriate mechanisms to execute it. As a result, the implementation process should be closely linked to the reality of the sector. Countries where the Bank is supporting sector reform may benefit from early engagement with SIASAR during project identification and preparation. For example, preliminary support may be better invested in policy development and institutional strengthening of different actors. Specifically, SIASAR has evolved as the result of a successful participatory process and the initiative has focused closely on product development and political engagement at the national scale while existing members are largely responsible for supporting the implementation process in country. While this approach has resulted in noteworthy achievements and SIASAR is now enshrined in national policy, implementation at the local scale is less rigorous. Strengthening the institutional capacity of local governments and WSS partners would promote a systematic transition from policy to practice, increase stakeholder awareness and better enable local governments to fully exploit the capabilities of SIASAR. This could be achieved through technical assistance directed at the regional scale e.g. supporting the development of the business and leadership skills required to manage a regional program, or targeted technical assistance in-country during the adoption and implementation process. This would also serve to promote accountability moving forward.

7 MOVING FORWARD

The SIASAR initiative has grown from an initial three members to 11 members in LAC in a relatively short period of time while garnering substantial international interest. Based on the lessons learned and experiences in LAC over the course of the TAs implementation, three critical areas are considered relevant to the future success of the initiative: Consolidation in LAC, Opportunities for Expansion and Next Frontier in Development of the Conceptual Model. The following sections describe a series of detailed recommendations designed to support each area moving forward.

7.1 Consolidation in LAC

Recognizing the need to consolidate this rapid expansion, members are fleshing out an evolving vision for the initiative's trajectory that contemplates the balance between the level of government involvement and donor support needed to ensure the sustainability and relevance of the initiative moving forward. One end of the spectrum envisions the need for ongoing TA support, while the other envisions greater autonomy of the SIASAR initiative. The latter approach would seek to strengthen government commitments through active participation in the development and maintenance of SIASAR as a means to generate additional buy-in and ownership based on several core recommendations to be implemented at the regional and country level:

Regional Level

Develop a two-step strategy designed to transition from current levels of donor funding to increased autonomy. Such an endeavor would require the Regional Working Groups to be significantly strengthened to support the ongoing operation and maintenance of SIASAR through: (i) an initial period to create an effective management strategy; and (ii) a transitional period to roll out the strategy to further define the roles and responsibilities of donors and members. To this end, members are currently drafting a strategic business plan to focus on the initiative's wider sustainability and explore the universe of possible options moving forward, comprising *inter alia* an analysis of different management models, such as creating: (i) a unifying regional association,[51] or (ii) multiple regional bases designed to represent the interests of a smaller, more consolidated and theoretically more manageable group of members.[52] To further this process, the Bank is supporting a detailed review of the legal and policy instruments regionally.

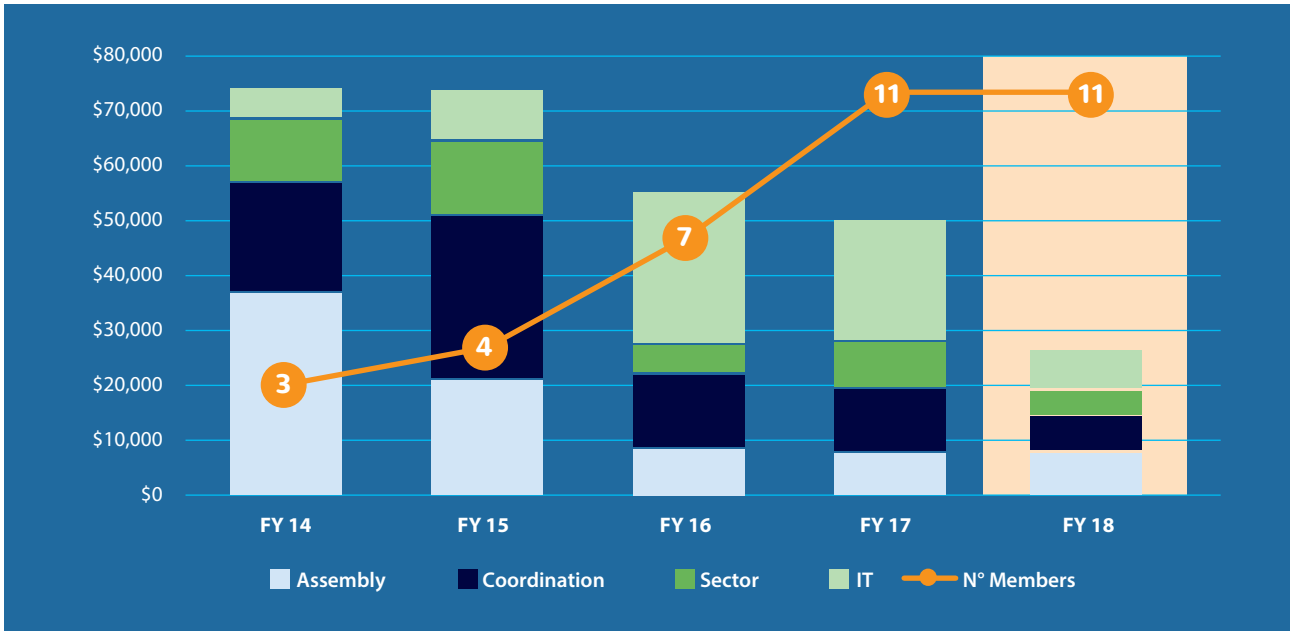
51 For example, ADERASA, the regional association of WSS regulators

52 For example: Central America and the Caribbean; the Andean Region, Middle-Income Countries, etc.

Identify alternative sources of funding, including preparing an annual budget in line with national budgets as well as considering regional sources of funding and sponsorship. In terms of financial impacts, the TA supported 68 percent of the initiative's total regional operational costs over its four-year implementation period (from FY14 to FY17), while members and other donors supported the remaining costs. More than half of all costs can be attributed to Sector and IT-related work, specifically to support the development of SIASAR 2.0, a major capital investment to be amortized over time. The use of freeware is intended to mitigate major capital investments by new members up front as would be required if acquiring a new information system. Furthermore, although minor adjustments to the conceptual model will be required in the future, the associated costs are unlikely to be significant. However, should a significant, unexpected capital outlay be required in the future, the costs would be shared between the entire membership. Although the cost overview (Section 5.3) is only indicative several patterns have emerged that can be used to guide future decision-making. Specifically, the effects of economies of scale are evident and total costs per member decrease with increased membership (Figure 25).

Evaluate membership contributions moving forward. Implementation costs are highly variable and depend largely on the existing capacity of the joining member and the particular implementation approach, with lower-capacity members resulting in higher costs. These findings could form the basis for re-evaluating membership contributions moving forward. One possibility might be to develop a sliding scale of membership fees based on, for example, technical support needs or to the contrary, technical support provided to the wider initiative. Moving forward, funding could be pooled to help countries establish a self-managed association to which the Bank could transfer functions currently supported by the TA i.e. sector specialists, IT specialists and administrative support. The association could then: (a) convene sector authorities among and between members, including logistical support for the annual SIASAR assembly; (b) provide technical support for new members; (c) support overall IT coordination; (d) offer limited financial support for strategic knowledge sharing and dissemination events; and, (e) continue refining the conceptual model and research agenda.

Figure 25: Projected (FY18) costs per member based on historical (FY14-FY17) costs to date



Country Level

Increase member capacity to operate and manage SIASAR from onboarding new members to implementation to long-term use. SIASAR has been member-led and driven from the outset and the TA sought to cultivate self-determination by embedding concepts of relatedness, competence and autonomy[53] within the approach. Members now lead the implementation process, a critical component designed to promote self-learning and south-south knowledge transfer. This has generated strong ownership and avoided symptoms of mistrust and apathy commonly associated with externally led initiatives. Regular milestones provide the momentum needed to accelerate the process and produce results, for example, annual assemblies provide the ideal platform to showcase new findings, benefitting the evolution of SIASAR.

Nonetheless, some members are less invested than others in part because their personnel aren't actively involved in working groups or they simply don't have any personnel to participate. The role of existing members in transferring knowledge to new members is well established, yet there is a noticeable lack of overall capacity to take on the regional leadership role, a responsibility that has often been left to the Bank. Conceivably, the democratic process through which SIASAR was created may have cultivated a general lack of willingness to assume roles of authority beyond members' boundaries. To the contrary, the Bank's continued support may have engendered certain expectations. Similarly, long-term commitment is still not embedded in each member's approach to SIASAR at the country level. For example, despite the volume of data collected to date, activities are heavily reliant on uncertain sources of funding and members would benefit from a systematic approach that goes beyond the political will leveraged to adopt SIASAR. Specifically, SIASAR's successful implementation requires dedicated capacity, budget and sector ranking.

The SIASAR information system was designed with the long-term sustainability of the initiative in mind. The platform uses open source, freeware to minimize costs. Additionally, the CMS has been custom built to require minimal specialized expertise ensuring members with low technological capacity can operate, maintain, and use the system. Nevertheless, some members have allocated staff that either lack the necessary skills or lack availability. This is further compounded by high staff turnover. In this context and to better serve the initiative moving forward, one of the alternative management models currently being analyzed includes creating centralized Working Groups enabling members to align themselves according to their expertise, instead of the current model that requires each member to provide a designated minimum number of specialists. This could prove particularly helpful in bridging the current technological gap, however, in the interim members will need continued external IT support.

Redefine the Bank's role and leverage donor support. This strategy would have the added benefit of enabling the Bank, and other donors such as the IDB and AECID, to provide strategic support to rural WSS operations and increase capacity at the local level through targeted investments and technical assistance. Specifically, the Bank and other donors have a critical role to play addressing the gap in analytical capabilities and broadening the use of SIASAR data to support the inclusion agenda, in particular gender and indigenous peoples. Decreasing the Bank's presence in the day-to-day management of SIASAR could promote greater participation of external stakeholders, particularly other international donors such as IDB and AECID. For example, all donors could actively support the mainstreaming of SIASAR in strategies and operations throughout the region, including in countries where they are not currently active. Specifically, the Bank could capitalize on existing experiences in Brazil and Mexico to brand and market SIASAR as the screening mechanism of choice for rural WSS interventions or support its inclusion as a disbursement-linked indicator in PforRs. Additionally, the Bank could actively collaborate with members and other donors to strengthen coordination between sector authorities and increase the uptake of SIASAR by other Ministries such as Finance and Health. Finally, the Bank could coordinate technical expertise motivating participating governments to take a more active role in the day-to-day operations of the initiative.

53 Based on Self-Determination Theory (Ryan and Deci, 2000).

7.2 Opportunities for Global Expansion

SIASAR is poised to expand globally driven by a concerted effort to disseminate SIASAR in global forums resulting in increased interest within the Bank and from countries, NGOs and donors in other regions particularly Africa and Southeast Asia.[54] The Bank will continue to play a key role in facilitating knowledge sharing and providing technical assistance to bring new members on board and should continue to actively support the global expansion of SIASAR as a global public good through either undertaking or supporting the following activities:

Determine the best management strategy moving forward, specifically, evaluate the balance between maintaining a consolidated global initiative and decoupling future regional initiatives. Either alternative would maintain a harmonized approach and harness existing experiences of cultivating ownership in LAC. Options include maintaining the current backend IT infrastructure while revising the frontend user interface to accommodate different regional requirements. Expansion beyond LAC would likely necessitate adopting a name with greater resonance in other languages and contexts.

Assess the maturation of a potential member's rural WSS sector to determine the most appropriate use of SIASAR and to craft the best pathway to success. While many countries and strategic partners may be keen to capitalize on SIASAR to collect and analyze data, a lack of sector support will limit SIASAR's capabilities and ongoing relevance (see Section 6.4). Additionally, while there are many commonalities between countries, there are also practical differences, for example, the widespread use of hand pumps in rural Africa versus the predominance of networked-systems in LAC. Although SIASAR is designed to accommodate such eventualities – and indeed hand pumps are common in rural Nicaragua – the application of SIASAR to distinct realities in practice should be carefully evaluated, particularly to ensure the proposed conceptual model aligns with existing governance models for data collection activities and decision-making. A carefully designed pilot program in Africa or Southeast Asia[55] could support this process.

Draw on lessons learned from LAC to inform the mix of skills needed to successfully launch SIASAR in other regions. A sense of realism concerning local capacities and timeframes required to launch the initiative in other regions will be required. SIASAR's successful deployment will hinge on identifying: (i) adequate human and financial resources; (ii) champions within the Bank and local counterparts; (iii) opportunities to capitalize on existing datasets or leverage data collection activities (for example through PforRs), and; (iv) partnerships with donors, NGOs and other interested stakeholders.

Increase credibility by developing an effective outreach strategy to engage global actors involved in the rural WSS sector. Opportunities for synergies with complimentary organizations should be explored in greater detail including the Rural Water Supply Network (RWSN) and international NGOs such as SNV, Water for People and WaterAid in addition to evaluating synergies with existing tools such as the Water Point Data Exchange (WPDx) and WaterAid's Water Point Mapper, and finally, other conceptual methodologies such as the Balanced Scorecard and *Proyecto-Enlace*. The RWSN provides a great springboard for global dissemination and learning exchanges while interfacing with the WPDx (which is designed to rapidly collect and collate extensive data), and the Balanced Scorecard initiative (which focuses on data processing and reporting). Such an exchange would be cross beneficial for expanding data analytics to promote decision-making, policy planning and guide investments in countries or regions where efforts have historically focused predominantly on data collection activities.

54 Mozambique recently participated in the third Annual Assembly held in Colombia in April 2017. The decision to invite Mozambique hinged in part on SIASAR's recent adoption by Brazil (Ceará) and SIASAR's corresponding translation into Portuguese, which was part of a strategic vision designed to promote exchanges between Portuguese-speaking countries. SIASAR can accommodate multiple languages, including non-Latin writing systems, without the need to reprogram the information system or operating tools and applications and which facilitates the rapid entry of new members. Notwithstanding, the questionnaires upon which all SIASAR data are based must first be translated.

55 Several countries have demonstrated interest or present viable opportunities for expansion, including: Mozambique, Tanzania, and Vietnam.

7.3 Next frontier in Development of SIASAR Conceptual Model

Refine the conceptual model to accommodate global expansion, new contexts, emerging reporting requirements, technological advances and to address the next generation of challenges and align with global monitoring initiatives such as the SDGs. Monitoring the SDG targets for drinking water and sanitation will require a holistic approach and credible data will be needed to stimulate political commitment, inform decision-making, underpin sector advocacy and trigger well-placed investments toward sustainable access to water, sanitation and hygiene (WASH) initiatives. In addition, SDG monitoring systems will need to be robust enough to adapt to advances in technology and accommodate the capacity of stakeholders, especially national sector and regulatory authorities.

SDG targets for drinking water and sanitation imply a transformation in current approaches to monitoring. On the one hand, developing methods to collect, analyze and report new indicators and expanding the existing JMP database will depend on continued improvements of national monitoring systems and processes. On the other hand, it will require continued technical advice and support from experts, policymakers, practitioners and donors committed to the progressive realization of the human rights to water and sanitation. Furthermore, strengthened collaboration between global monitoring initiatives will be needed, including among others the Joint Monitoring Program (JMP) and the Global Assessment and Analysis of Drinking Water and Sanitation (GLAAS).

Although SIASAR was conceived prior to the establishment of the SDGs and remains first and foremost a tool for monitoring the sustainability of rural WSS services, the Bank, in partnership with member countries and the support of the UPC, recently refined the SIASAR conceptual model to align the current framework with the SDGs where possible and SIASAR has now emerged as a complementary monitoring tool to inform the SDGs.[56] In particular, SIASAR 2.0 incorporates a simplified assessment of WASH in schools and health care centers. Moreover, SIASAR can be adapted to changing monitoring requirements as needed.

Refining the conceptual model to ensure alignment with concurrently evolving Bank initiatives that similarly address sustainability in the rural water sector, specifically "Sustainability Assessment of Rural Water Service Delivery Models: Findings of a Multi-Country Review"[57] and "Developing Rural Water Metrics for Sustainability: An Assessment of Existing Indicators of Sustainability"[58] is equally important to ensuring a coherent and cohesive approach within the Bank.

Finally, the need to remain at the forefront of technological advances in line with SIASAR's final guiding principal is critical to ensuring the long-term relevance and success of SIASAR. SIASAR 2.0's ability to update a single data field remotely could respond to recent technological advances, such as low-cost sensors, which could be incorporated into SIASAR enabling the remote monitoring of systems. Similarly, opportunities exist to expand SIASAR's geospatial capabilities. For example, as data on schools and health centers are collected, SIASAR could highlight public facilities without access to water or sanitation.

56 UPC, 2017.

57 (P159391) A desk review of existing service delivery approaches from 16 countries was undertaken to identify the "conditions, challenges and emerging good practices that support sustainability" with a view to "building sector capacity and strengthening sustainable service delivery models for rural areas" (World Bank, 2017a). One finding of particular relevance to SIASAR is the variability in local capacities between countries. Consequently, the ability to achieve a universally defined sustainability metric is highly relative and a tiered approach whereby a country's progress is aligned to the maturation of its rural WSS sector may be more appropriate. Similarly, given service level standards differ and are similarly linked to the strength of a country's rural WSS sector, service level thresholds may need to be revised moving forward.

58 (P159391) This initiative assessed 40 sustainability indicator frameworks currently in use with a view to determining their structure and use and commonalities and differences (World Bank, 2017b). While the assessment revealed diversity among the various frameworks, key similarities were also identified including, among others, indicator groups addressing: performance of water supply schemes whereby the number of indicators increases with system complexity, user satisfaction, and service provider performance giving rise to a set of "performance metrics." The SIASAR conceptual model currently addresses some of the proposed indicators, such as service provider performance, yet would nevertheless benefit from a careful review to identify potential streamlining opportunities prior to undergoing further expansion.

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ANNEXES

ANNEX 1. SIASAR Strategic Partners by Country

Strategic Partners

- AECID – Spanish Agency for International Development Cooperation
- CABEI – Central American Bank for Economic Integration
- CAF – Development Bank of Latin America
- EC – European Commission
- KFW – German Development Bank
- IDB – Inter-American Development Bank
- MEC – Spanish Ministry of Economic and Competitiveness
- SFLAC – Spanish Fund for Latin American and Caribbean.
- SDC – Swiss Agency for Development and Cooperation
- WB – World Bank

Regional networks

- CLOCSAS – Latin American Confederation of Water and Sanitation Communitarian Organizations
- FOCARD-APS – Central American and Dominican Republic Water and Sanitation Forum

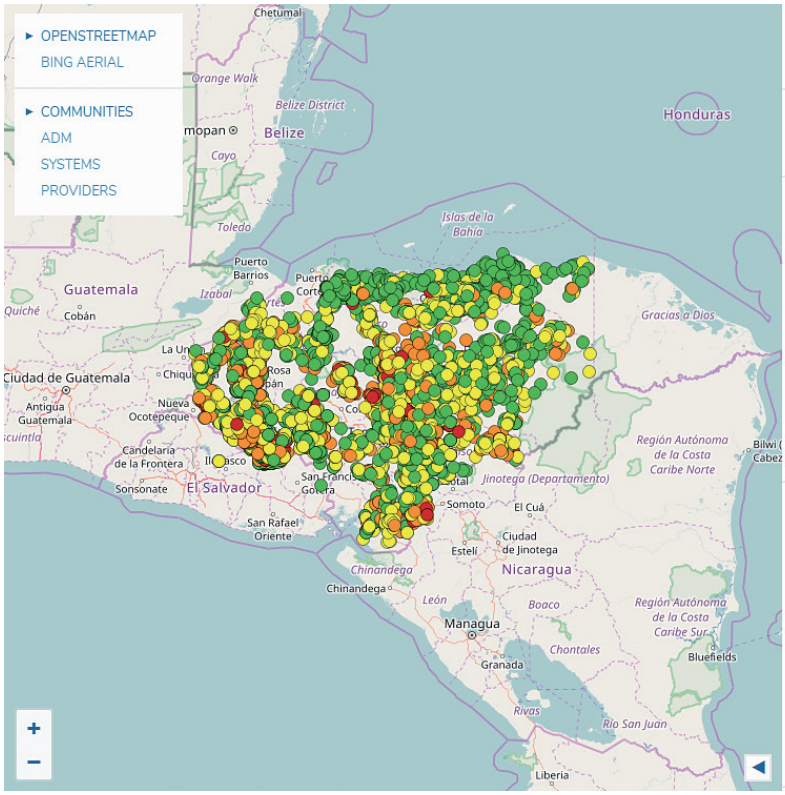
International NGO, Research and Academic Partners

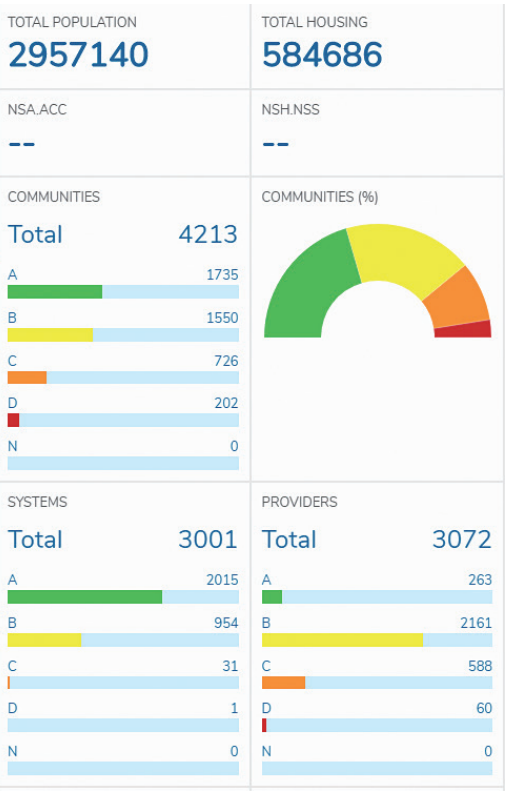
- IRC – Water and Sanitation International Research Center
- UPC – Polytechnic University of Catalonia
- UNICEF - United Nations Children's Fund
- WfP – Water for People (NGO)
- CRS – Catholic Relief Service (NGO)

ANNEX 2. SIASAR MEMBER FACT SHEETS

Honduras

Basic Data	
Capital	Tegucigalpa
Area	112,492 sq km
Total Population	8,570,154
Rural population	46%
People per sq km	46
HDI	0.617
No. Communities	28,000 (est.)
No. Systems	7,000 (est.)
No. Service Providers	6,300 (est.)
Date of Membership	2011





SIASAR Management Structure	
Lead Agency	Servicio Autónomo Nacional de Acueductos y Alcantarillados (SANAA)
Data Collection	SANAA, Fondo Hondureño de Inversión Social (FHIS), municipalities, NGOs (WfF, CRS, etc.)
Data Validation	SANAA
Strategic Partners	Consejo Nacional de Agua Potable y Saneamiento (CONASA), Ente Regulador de los Servicios de Agua Potable y Saneamiento (ERSAPS)
Main Source(s) of Funding	National budget, IDB, World Bank

SIASAR in Practice

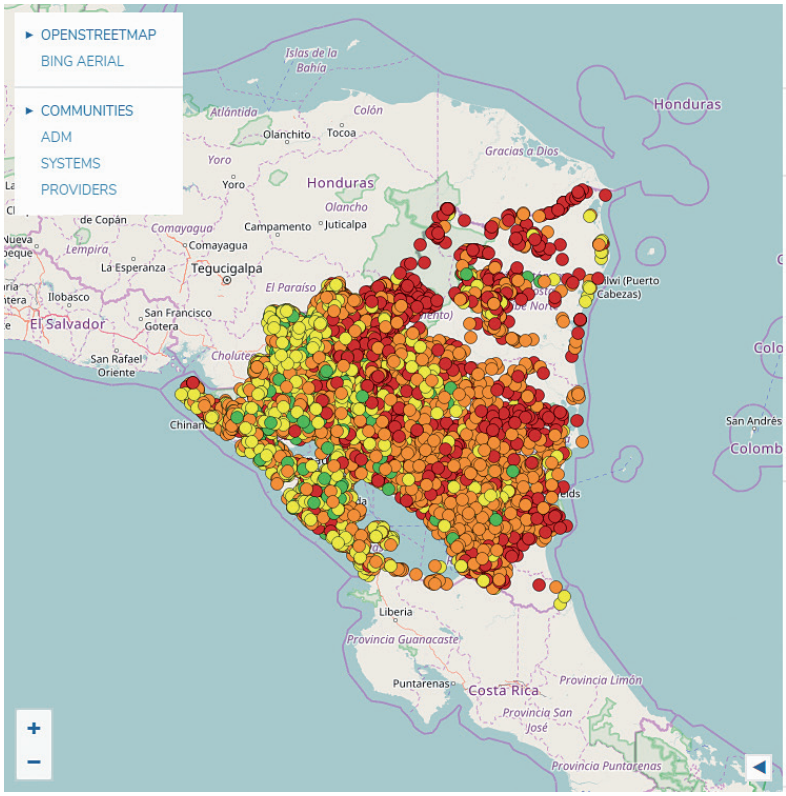
- 28 rural WSS profiles developed to inform municipal development plans

Contact Information	
Contact Person	Javier Rivera
Institution	SANAA
Address	Primera Avenida 13 calle, Comayaguela MDC Honduras
e-mail	honduras@siasar.org

Nicaragua




Basic Data	
Capital	Managua
Area	129,494 sq km
Total Population	6,039,000
Rural population	38%
People per sq km	42.6
HDI	0.615
No. Communities	7,334 (est.)
No. Systems	3,000 (est.)
No. Service Providers	2,800 (est.)
Date of Membership	2011



TOTAL POPULATION **3314611**

TOTAL HOUSING **623271**

NSA.ACC --

NSH.NSS --

COMMUNITIES

Total	6664
A	581
B	2027
C	2700
D	1356
N	0

COMMUNITIES (%)

SYSTEMS

Total	3976
A	1521
B	2099
C	282
D	74
N	0

PROVIDERS

Total	1163
A	32
B	435
C	607
D	89
N	0

SIASAR Management Structure	
Lead Agency	Nuevo Fondo de Inversión Social y Emergencias (FISE)
Data Collection	FISE, municipalities
Data Validation	FISE
Strategic Partners	Instituto Nicaragüense de Fomento Municipal (INIFOM), Empresa Nicaragüense de Acueductos y Alcantarillados (ENACAL)
Main Source(s) of Funding	National budget, World Bank

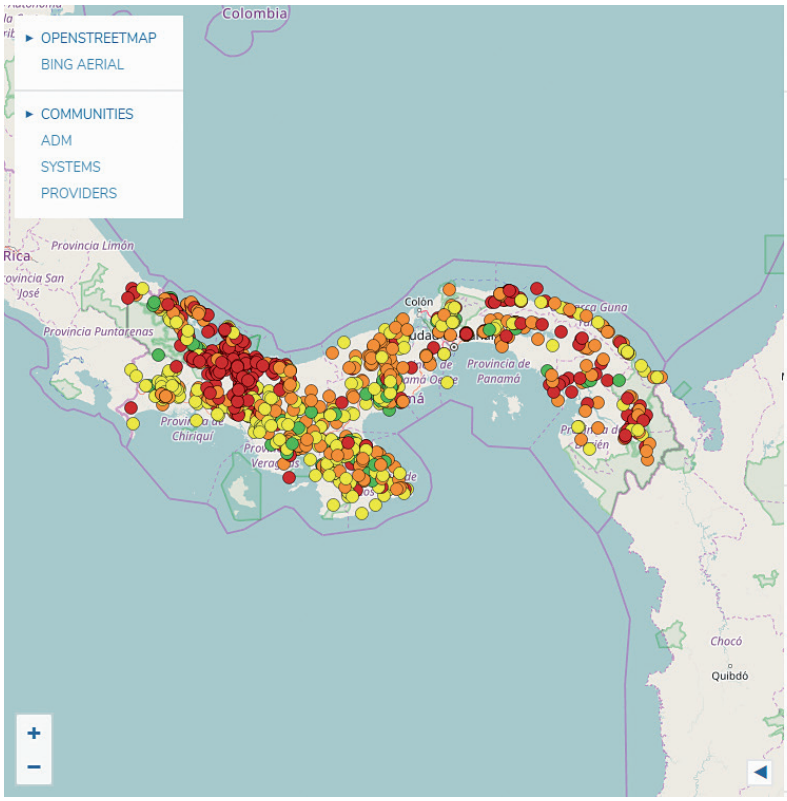
SIASAR in Practice

- 64 municipal rural water and sanitation plans prepared
- SIASAR results-based municipal training program developed
- National Rural Water and Sanitation Plan informed (2016)
- National Water Resources Management Plan informed (2017)

Contact Information	
Contact Person	-
Institution	Nuevo FISE
Address	Altamira D'Este (Contiguo a Clínica Tiscapa), Managua
e-mail	nicaragua@siasar.org

Panama

Basic Data	
Capital	Panama City
Area	75,517 sq km
Total Population	3,773,252
Rural population	38%
People per sq km	49
HDI	0.765
No. Communities	11,580 (est.)
No. Systems	4,000 (est.)
No. Service Providers	-
Date of Membership	2011



TOTAL POPULATION **352703**

TOTAL HOUSING **75226**

NSA.ACC --

NSH.NSS --

COMMUNITIES

Total	1119
A	83
B	323
C	398
D	315
N	0

COMMUNITIES (%)

SYSTEMS

Total	564
A	94
B	380
C	74
D	16
N	0

PROVIDERS

Total	609
A	27
B	334
C	215
D	33
N	0

SIASAR Management Structure	
Lead Agency	Ministerio de Salud (MINSA)
Data Collection	MINSA
Data Validation	MINSA
Strategic Partners	Instituto de Acueductos y Alcantarillados Nacionales (IDAAN), Consejo Nacional para el Desarrollo Sostenible (CONADES)
Main Source(s) of Funding	National budget World Bank, IDB/AECID

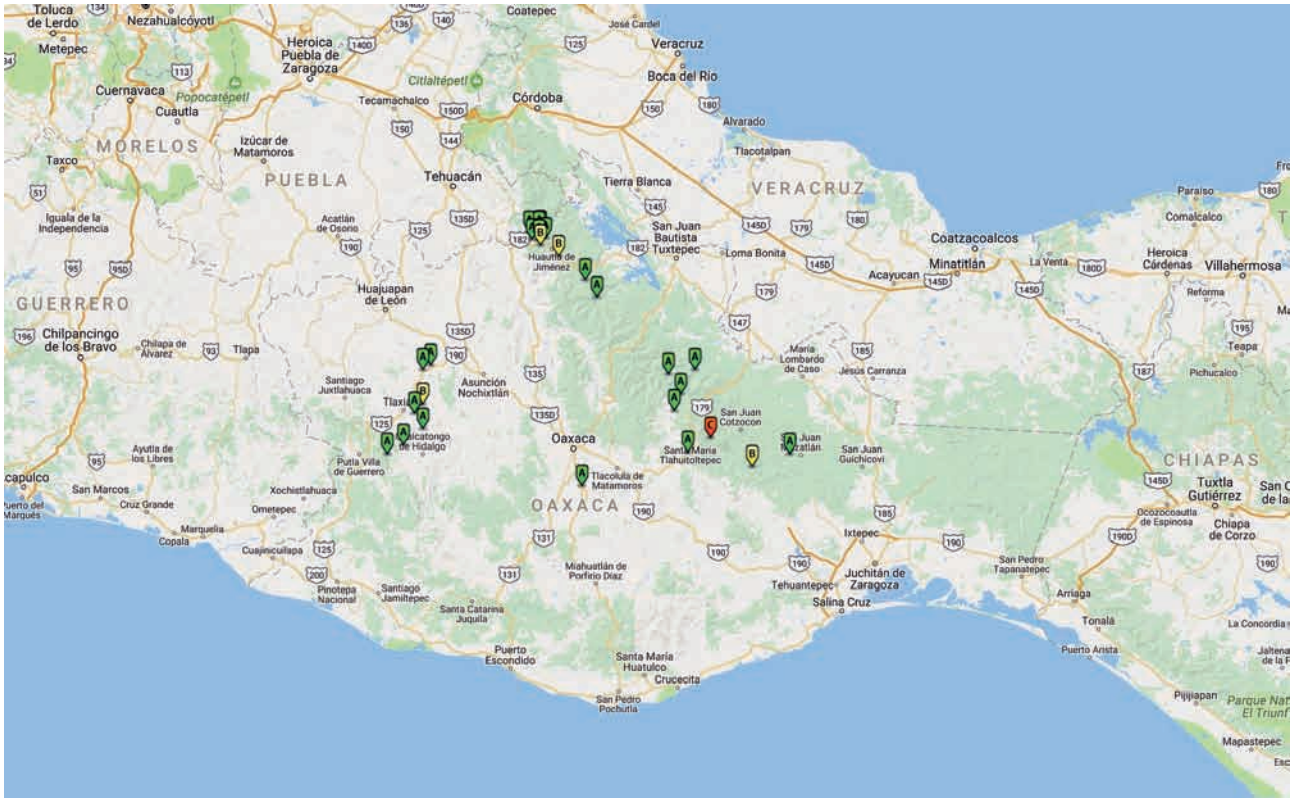
SIASAR in Practice

- Data from 150 indigenous communities were collected, validated and processed and are being used to inform the National Indigenous Peoples Development Plan

Contact Information	
Contact Person	Ricardo Cerrud
Institution	MINSA/DISAPAS
Address	Antiguo Hospital Gorgas, detrás del Instituto Oncológico, Ancón.
e-mail	panama@siasar.org

Oaxaca, Mexico

Basic Data	
Capital	Oaxaca de Juárez
Area	93,757 sq km
Total Population	3,802,000
Rural population	53%
People per sq km	41
HDI	0.681
No. Communities	10,301 (est.)
No. Systems	3,900 (est.)
No. Service Providers	3,900 (est.)
Date of Membership	2014



SIASAR Management Structure	
Lead Agency	Comisión Estatal del Agua de Oaxaca (CEA Oaxaca)
Data Collection	CEA Oaxaca
Data Validation	CEA Oaxaca
Strategic Partners	Instituto Nacional de Estadística y Geografía (INEGI), Secretaria de Finanzas (SEFIM)
Main Source(s) of Funding	National budget, World Bank

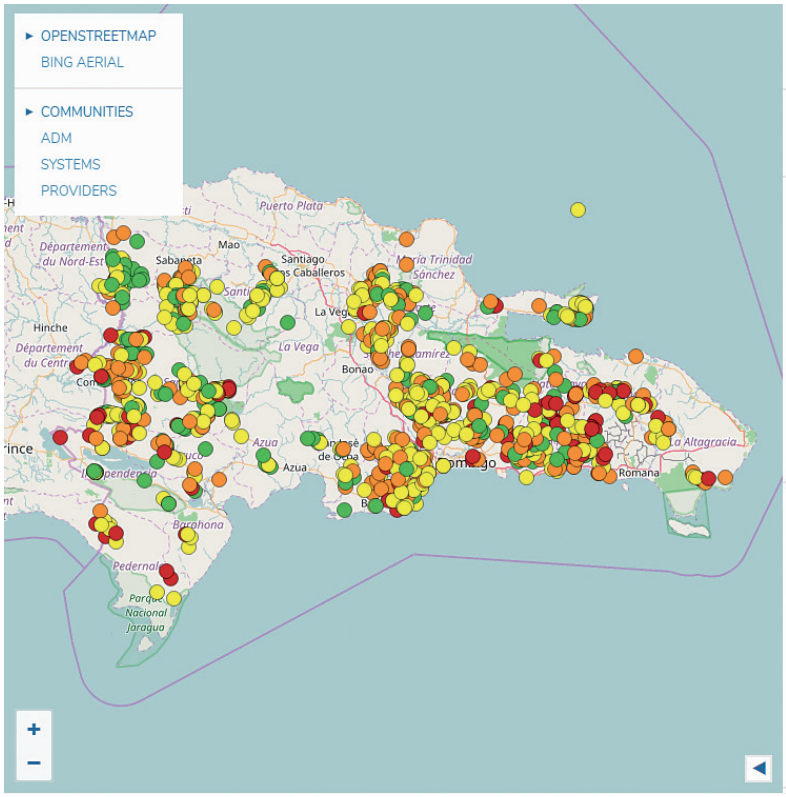
SIASAR in Practice

- Expected to collect data from 600 communities in 2017
- SIASAR will be used to improve rural sector knowledge and design specific rural plans to prioritize water investments

Contact Information	
Contact Person	Antonio Santibáñez
Institution	CEA Oaxaca
Address	Reyes Mantecon San Bartolo Coyotepec Oaxaca de Juárez CP. 7125
e-mail	oaxaca@siasar.org

Dominican Republic

Basic Data	
Capital	Santo Domingo
Area	48,311 sq km
Total Population	9,378,818
Rural population	25%
People per sq km	204
HDI	0.732
No. Communities	11,488 (est.)
No. Systems	3,000 (est.)
No. Service Providers	400 (est.)
Date of Membership	2014



TOTAL POPULATION
844536

TOTAL HOUSING
175949

NSA.ACC
--

NSH.NSS
--

COMMUNITIES
Total 1097

A	200
B	463
C	331
D	103
N	0

COMMUNITIES (%)

SYSTEMS
Total 414

A	44
B	244
C	74
D	52
N	0

PROVIDERS
Total 167

A	10
B	56
C	76
D	25
N	0

SIASAR Management Structure	
Lead Agency	Instituto Nacional de Aguas Potables y Alcantarillados (INAPA)
Data Collection	INAPA, NGOs
Data Validation	INAPA
Strategic Partners	AECID, IDB
Main Source(s) of Funding	National budget

SIASAR in Practice

- 36 water systems rehabilitated through targeted technical assistance
- 8 community service providers created
- 9 project profiles prepared

Contact Information	
Contact Person	Gumercindo Vásquez
Institution	Instituto Nacional de Agua Potable y Alcantarillado (INAPA)
Address	Calle Guarocuya # 419, Edificio INAPA, El Millón, Santo Domingo
e-mail	dominicana@siasar.org

Costa Rica

Basic Data	
Capital	San José
Area	51,100 sq km
Total Population	5,001,000
Rural population	41%
People per sq km	95
HDI	0.764
No. Communities	5,000 (est.)
No. Systems	-
No. Service Providers	-
Date of Membership	2014

TOTAL POPULATION
55665

TOTAL HOUSING
14594

NSA.ACC
--

NSH.NSS
25.27%

COMMUNITIES
Total 106

A	0
B	0
C	0
D	0
N	106

COMMUNITIES (%)

SYSTEMS
Total 5

A	0
B	0
C	5
D	0
N	0

PROVIDERS
Total 9

A	0
B	0
C	7
D	2
N	0

SIASAR Management Structure	
Lead Agency	Instituto Costarricense de Acueductos y Alcantarillados (AyA)
Data Collection	AyA
Data Validation	AyA
Strategic Partners	Instituto Nacional de Estadística y Censos (INEC)
Main Source(s) of Funding	National budget

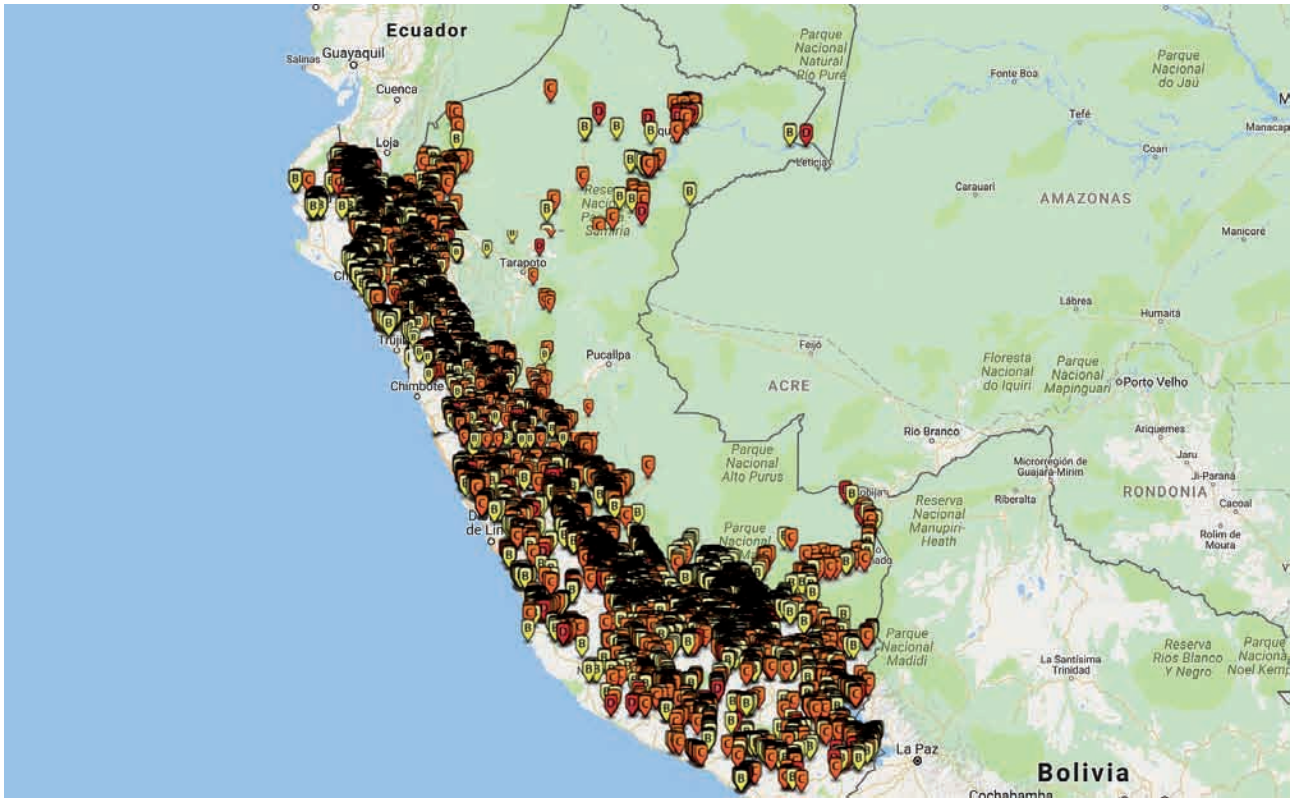
SIASAR in Practice

- Data collection began in 2015 using existing information system
- Team is now working to migrate data from approximately 500 communities into SIASAR
- SIASAR will help AyA to improve the level of technical assistance provided to community service providers (ASADAS)

Contact Information	
Contact Person	Tomás Cavanillas
Institution	Instituto Costarricense de Acueductos y Alcantarillados (AyA)
Address	Rohrmoser 104 San José Costa Rica
e-mail	costarica@siasar.org

Peru

Basic Data	
Capital	Lima
Area	1,285,216 sq km
Total Population	30,380,000
Rural population	24%
People per sq km	24
HDI	0.737
No. Communities	85,000 (est.)
No. Systems	22,000 (est.)
No. Service Providers	-
Date of Membership	2015



SIASAR Management Structure	
Lead Agency	Ministerio de Vivienda, Construcción y Saneamiento (MVCS)
Data Collection	Municipalities
Data Validation	MVCS
Strategic Partners	Ministerio de Desarrollo e Inclusión Social (MIDIS)
Main Source(s) of Funding	SDC, national budget

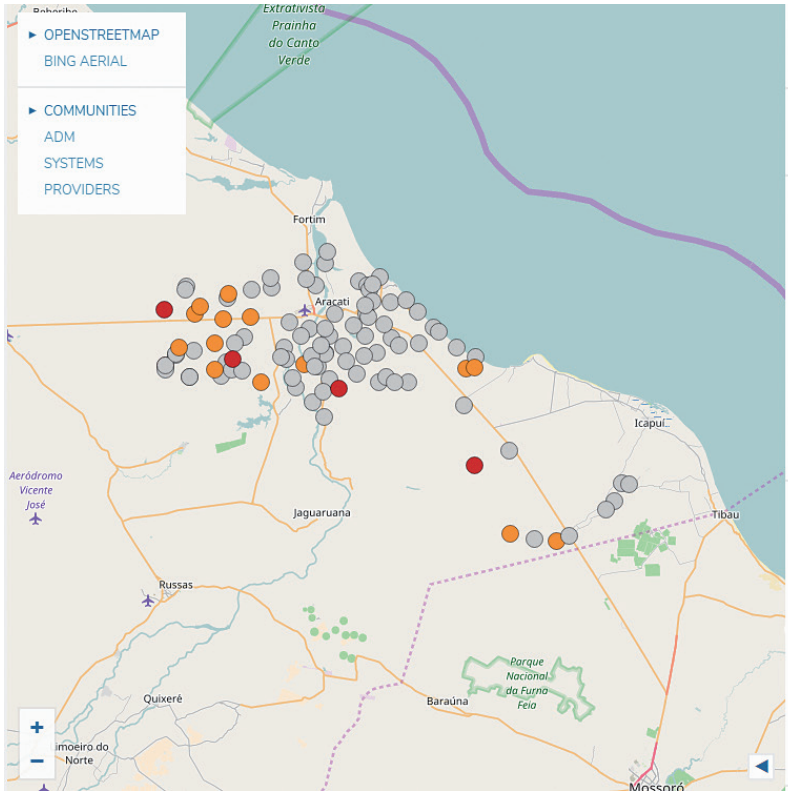
SIASAR in Practice

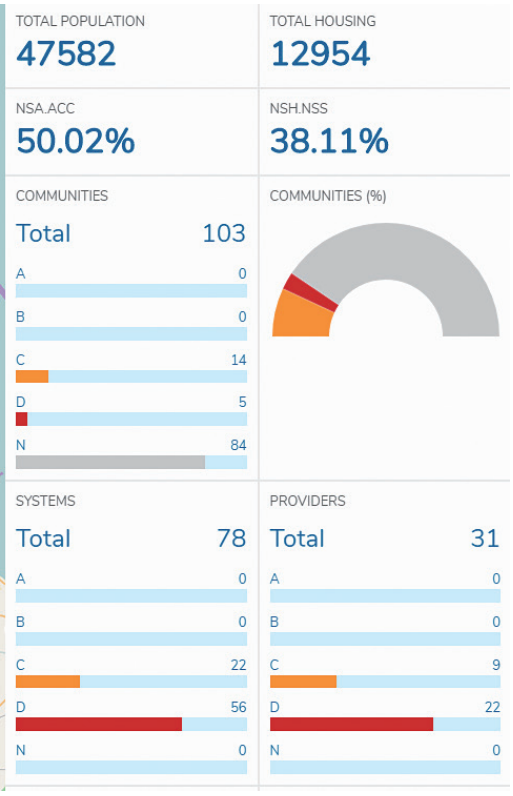
- Data collected using a proprietary information system
- Data from 10,000 communities have been migrated to SIASAR, and data from 65,000 communities expected to be migrated in 2017
- Created 1,426 municipal technical teams
- Date have been used to schedule operation restoration work for 2,278 rural systems and to monitor chlorine treatment performance

Contact Information	
Contact Person	-
Institution	Ministerio de Vivienda, Construcción y Saneamiento
Address	Paseo de la República 3361 - Edificio Petroperú San Isidro, Lima
e-mail	peru@siasar.org

Ceara, Brazil

Basic Data	
Capital	Fortaleza
Area	148,920 sq km
Total Population	8,843,000
Rural population	23%
People per sq km	60
HDI	0.682
No. Communities	17,500 (est.)
No. Systems	-
No. Service Providers	-
Date of Membership	2016





SIASAR Management Structure	
Lead Agency	Secretaria das Cidades (SCidades)
Data Collection	Companhia de Água e Esgoto do Ceará (CAGECE), Sistema Integrado de Saneamento Rural (SISAR), Municipalities
Data Validation	SCidades, CAGECE
Strategic Partners	Ministry of National Integration, Secretaria do Desenvolvimento Agrário (SDA)
Main Source(s) of Funding	World Bank, national budget

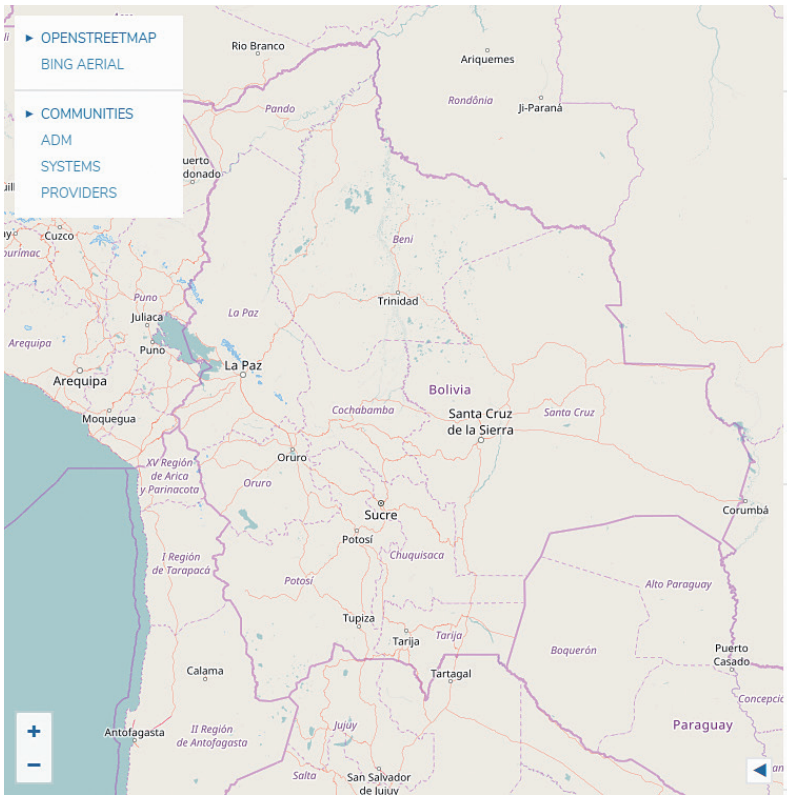
SIASAR in Practice

- First pilot conducted in the Municipality of Aracati in 2016
- Date used to inform the Municipal Water and Sanitation Plan
- Data from approximately 10,000 communities is expected to be collected between 2017 and 2018

Contact Information	
Contact Person	-
Institution	Secretaria das Cidades
Address	Av. Gal Afonso Albuquerque Lima - Ed. SEPLAG 1ºAndar – Fortaleza Ceará
e-mail	ceara@siasar.org

Bolivia

Basic Data	
Capital	Sucre
Area	1,098,581 sq km
Total Population	10,059,856
Rural population	33%
People per sq km	9
HDI	0.662
No. Communities	19,179 (est.)
No. Systems	13,215 (est.)
No. Service Providers	13,215 (est.)
Date of Membership	2016



TOTAL POPULATION --

TOTAL HOUSING --

NSA.ACC --

NSH.NSS --

COMMUNITIES

Total 0

A	0
B	0
C	0
D	0
N	0

COMMUNITIES (%)

SYSTEMS

Total 1

A	0
B	0
C	0
D	1
N	0

PROVIDERS

Total 0

A	0
B	0
C	0
D	0
N	0

SIASAR Management Structure	
Lead Agency	Ministerio de Medio Ambiente y Agua (MMAyA)
Data Collection	MMAyA, NGOs, Municipalities
Data Validation	MMAyA
Strategic Partners	Servicio Nacional para la Sostenibilidad de Servicios e Saneamiento Básico (SENASBA), Autoridad de Fiscalización y Control Social de Agua Potable y Saneamiento Básico (AAPS), NGOs, UNICEF
Main Source(s) of Funding	World Bank, AECID, IDB, NGOs, national budget

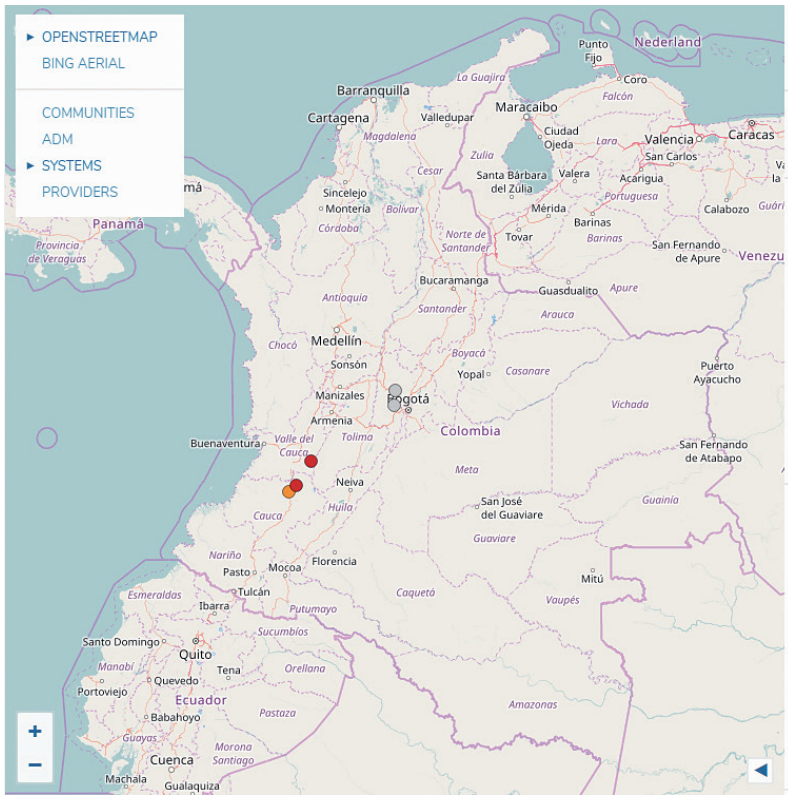
SIASAR in Practice

- Pilots scheduled to commence in 2017 supported by Water for People, UNICEF, World Bank, IDB and AECID
- Data from approximately 19,000 communities expected to be collected between 2017 and 2018
- SIASAR will help to inform the water indicators in the 2025 Patriotic Agenda and the National Water and Sanitation Plan

Contact Information	
Contact Person	Viceministro de Agua Potable y Saneamiento Básico
Institution	Dirección General de Agua Potable y Alcantarillado Sanitario
Address	Calle Capitán Castrillo No. 434, zona San Pedro. La Paz
e-mail	bolivia@siasar.org

Colombia

Basic Data	
Capital	Bogotá
Area	1,141,748 sq km
Total Population	48,747,632
Rural population	24%
People per sq km	42.70
HDI	0.702
No. Communities	40,000 (est.)
No. Systems	11,000 (est.)
No. Service Providers	9,000 (est.)
Date of Membership	2016



TOTAL POPULATION
6817

TOTAL HOUSING
1640

NSA.ACC
--

NSH.NSS
38.90%

COMMUNITIES
Total 5

A	0
B	0
C	0
D	0
N	5

COMMUNITIES (%)

SYSTEMS
Total 5

A	0
B	0
C	1
D	2
N	2

PROVIDERS
Total 3

A	0
B	0
C	1
D	2
N	0

SIASAR Management Structure	
Lead Agency	Ministerio de Vivienda, Ciudad y Territorio (MVCT)
Data Collection	Departments, Municipalities
Data Validation	MVCT, Departments
Strategic Partners	Departamento Administrativo Nacional de Estadística (DANE), NGOs
Main Source(s) of Funding	World Bank, AECID, SDC, national budget

SIASAR in Practice

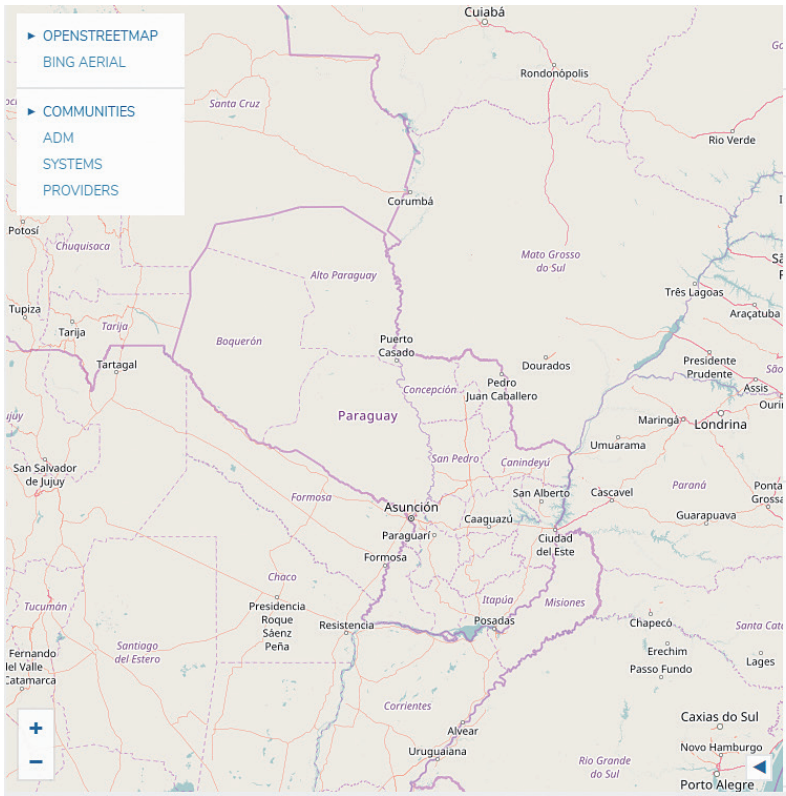
- First pilots scheduled for 2017 supported by World Bank, AECID and SDC, in partnership with departments and municipalities
- SIASAR is part of the official sector information system in Colombia and will be used to inform Departmental and Municipal Water Plans

Contact Information	
Contact Person	Karen López,
Institution	Viceministerio de Vivienda, Ciudad y Territorio, y Viceministerio de Agua
Address	-
e-mail	colombia@siasar.org

Paraguay




Basic Data	
Capital	Asunción
Area	406,752 sq km
Total Population	6,854,536
Rural population	17%
People per sq km	42.70
HDI	0.679
No. Communities	4,300 (est.)
No. Systems	3,200 (est.)
No. Service Providers	3,200 (est.)
Date of Membership	2017



TOTAL POPULATION: --

TOTAL HOUSING: --

NSA.ACC: --

NSH.NSS: --

COMMUNITIES

Total	0
A	0
B	0
C	0
D	0
N	0

COMMUNITIES (%)

SYSTEMS

Total	0
A	0
B	0
C	0
D	0
N	0

PROVIDERS

Total	0
A	0
B	0
C	0
D	0
N	0

SIASAR Management Structure	
Lead Agency	Ministerio de Obras Públicas y Comunicaciones (MOPC)
Data Collection	Servicio Nacional de Saneamiento Ambiental (SENASA), Ente Regulador de Servicios Sanitarios (ERSSAN), Municipalities, NGOs
Data Validation	SENASA, ERSSAN
Strategic Partners	PNUD, NGOs
Main Source(s) of Funding	World Bank, IDB, AECID, national budget

SIASAR in Practice

- Full implementation scheduled for 2017
- First pilots expected end 2017 with strategic partner's support, specifically World Bank, IDB and AECID

Contact Information	
Contact Person	Claudia Crosa
Institution	Dirección de Agua Potable y Saneamiento Ministerio de Obras Públicas y Comunicaciones
Address	Alberdi e/ Oliva. Asunción
e-mail	paraguay@siasar.org

SIASAR

WORLD BANK GROUP
Water