Sustainability Index of WASH Activities

Dominican Republic Country Report

JANUARY 2013

PRINICPAL AUTHOR
Ryan Schweitzer

SURVEY AND RESEARCH STAFF
Pamela Schreier and Ilana Cohen

AGUACONSULT

Building Partnerships for Development in Water & Sanitation

Sustainability Index of WASH Activities
Country Report for Dominican Republic

Table of Contents

Acronyms and Abbreviations

Agencia Espanola de Cooperacion y Desarollo Internacional (Spanish Agency for Cooperation and International Development)	AECID
biosand water filter	BSF
ceramic water filter	CWF
community facilitators	CF
community health promoters	CHP
community reticulated system	CRS
Consejo Estatal del Azúcar (State Sugar Board)	CEA
Corporación de Agua y Alcantarillado (Provincial organisations tasked with the provision of wáter outside the juristiction of INAPA	CORAA
Dirrección Provincial de Salud (Provinical Division of the Ministry of Public Health)	DPS
Dominican Pesos	RD
Dominican Republic	DR
financial	F
Fundación para el Desarrollo Comunitario/Save the Children Dominicana (Save the Children Dominican Republic, Inc.)	FUDECO
household latrine	HHL
household water treatment	HWT
hygiene and handwashing promotion	HWP
institutional	I
institutional sanitation facility	INS
Instituto Nacional de Agua Potables y Alcantarillados (National Institute for Water Supply and Sewage)	INAPA
International H20 Collaboration	Alliance
Management	M
Ministerio de Educación (Minstry of Education)	MINERD
Ministerio de Obras Públicas y Comunicación (Ministry of Public Works and Communication)	MOPC
Ministerio de Salud Pública y Asistencia Social (Ministry of Public Helath and Social Assistance)	MISPAS
Mujeres en Desarrollo Dominicana, Inc. (Dominican Women in Development)	MUDE
National Planning Office	ONAPLAN
Pan-American Health Organization	PAHO
Peace Corps Dominican Republic	PCDR
Population Services International	PSI
Rotary Club	RC
Rotary International/The Rotary Foundation	RI/TRF
Save the Children Federation, Inc.	SCUS
service authority	SA
service provider	SP
technical	T

Unidad de Atención Primaria de Salud (Primary Care Rural Clinics)	UNAPS
Unidad Ejecutora de Acueductos Rurales (Implementing Unit for Rural Aqueducts)	UEAR
US Agency for International Development	USAID
US dollars	USD
water, sanitation, and hygiene	WASH
Water and Sanitation Rotarian Action Group	WASRAG
World Health Organization	WHO

1. Introduction

The International H20 Collaboration (*the Alliance*) is a worldwide Alliance between Rotary International/The Rotary Foundation (RI/TRF) and the United States Agency for International Development (USAID). The Dominican Republic is one of three pilot countries where this Alliance was operationalized with the goal of implementing sustainable water, sanitation, and hygiene (WASH) projects. At the international level the Alliance was formalized in March of 2009, however in the Dominican Republic it was not officially launched until June of 2010[1]. Under the Alliance, District 4060 of Rotary International, through its Health, Hunger, and Humanity (3-H) Grants Program, and USAID-Dominican Republic Mission, through its Batey Community Development Project[2], agreed to allocate one million US dollars each, a total of two million, to the identification, development and implementation of joint water and sanitation activities[3].

Since 2003, District 4060 (consisting of 65 Rotary Clubs grouped into one nationwide district - Dominican Republic), has been promoting household water treatment and safe storage (HWT). Through the Children's Safe Water Program approximately 19,000 biosand filters (BSF) have been distributed in 300 communities throughout the country (70426 application 2009). This experience combined with the fundraising capabilities developed over the past decade permitted District 4060 to leverage $500,000 in matching funds from RI/TRF (3-H Grant #70426) to secure the 1 Million USD required for the Alliance. Through this grant the Dominican non-governmental organization ENTRENA S.A. was contracted to develop and operate an education program for the training of community facilitators (e.g.-"training of trainers"). Between August 2011 and March of this year, 190 community facilitators were trained in filter installation, operation, maintenance and household hygiene/hand-washing promotion (HWP). The objective is that community facilitators take these skills to their communities, conduct similar education campaigns, install filters, and train users in filter operation and maintenance. Community facilitators have installed approximately 6,000[4] BSFs in 134 communities under the Alliance with an additional 2,500 to 3,000 planned for distribution. Although BSF are the main focus of Rotary's efforts in the Alliance, funds were provided to build two community reticulated water systems (CRS) designed by a Peace Corps volunteer in the province of Puerto Plata. In addition, 180,000 USD of Rotary funds were made available to the implementing partners of USAID's Batey Community Development Project to finance materials for WASH construction projects and provide biosand filters to residents of the *bateys*[5].

As a part of the Batey Community Development Project (RFA 517-08-010) USAID-Dominican Republic Mission entered into a cooperative agreement with Save the Children-US (SCUS). Under this agreement, formalized in 2009, SCUS is the Prime Receipt/Grantee and supervises various implementing partners including: 1) FUDECO-the Dominican affiliate of Save the Children and 2) *Mujeres en Desarollo Dominicano* (MUDE). The goal of this project is to improve the quality of life of

[1] Memorandum of Understanding (MOU) between Rotary District 4060 and USAID-DR Mission representatives signed on June 5, 2010.
[2] The MOU specifically states "portfolio of current and future development projects involved in water and sanitation…to be managed by Save the Children United States."
[3] Hygiene was not explicitly mentioned in the June 5, 2010 MOU.
[4] According to the warehouse inventory file "104 Control Entrega 3H 70426.xls" version of March 13, 2012.
[5] *Bateys* were originally work camps built by the Dominican government on or near sugar cane plantations to house their workers. In the decline of sugar production these camps evolved into rural communities.

batey residents by focusing on improvements in health and nutrition, basic education, shelter, and water and sanitation (RFA 517-08-010). The total project budget is 9.5 million USD, of which 1.3 million USD is allocated for WASH interventions[6]. These interventions include construction and/or rehabilitation of water points and distribution networks, household pit latrines (HHL), sanitation facilities at primary schools (INL), household water treatment (HWT), and hygiene/handwashing promotion (HWP). The first phase of the project (2009-2010) targeted eight *bateys* in the East, and under the second phase (2011-2012) work was expanded to an additional two *bateys* in the East and two in the South, for a total of twelve *bateys*.

Table 1 shows the summary of interventions considered under the Alliance. This includes all interventions using Rotary District 4060's 3-H Grant money and all WASH interventions of the Batey Community Development Project. The range of interventions include: newly constructed or rehabilitated community reticulated systems (CRS), shared or private household latrines (HHL), school or institution sanitation facilities[7] (INS), hygiene/hand washing promotion (HWP), and housedhold water treatment (HWT). A number of different water treatment technologies were piloted tested in *bateys* to determine their appropriateness including: biosand filters (BSF), ceramic filters (CWF), and Lifestraw®filters, however the later was not widely promoted thus is not considered in this evaluation.

Table 1: Summary of WASH interventions considered under The International H20 Collaboration (Alliance) in the Dominican Republic.

	Unique Interventions					Total
	CRS	HHL	INS	HWP	HWT	
Total Communities	14	14	8	139	134	139
Sample Communities	6	6	5	19	19	19
Total Number of Interventions	13	487	10	8210	6749	N/A
Household Surveys	181	160	N/A	501	282	1,124

Note: There were reportedly 5,863 biosand filters distributed to community access partners to date and approximately 886 ceramic water filters distributed by USAID's implementing partners.

Long-term sustainability of WASH interventions is widely recognized as a complex and persistent challenge facing communities, governments and international development partners alike. Responding to Rotary International and USAID's call for an early and strategic evaluation of the sustainability of its investments and for recommendations for future Alliance programming, a framework was developed. This framework, called the **Sustainability Index Tool**, focuses on four critical areas that are known to be importance to the long-term sustainability of WASH interventions: **institutional**, **management**, **financial**, and **technical** factors. Sector experience has demonstrated the importance of accounting for the enabling environment in evaluation processes. Therefore the Sustainability Index includes data collected at the 'project intervention' level, whether at the household, community or system level, and as well as information relating to the broader

[6] 1.3 million USD is budgeted for programmatic costs (e.g.-pump installation, well rehabilitation, latrine construction, software, and training) and another 1.2 million USD covers non-programmatic costs (e.g.-NGO employee salaries, per diem, equipment). Total WASH budget is 2.5 million USD.

[7] Improvements to the water systems at schools is considered a part of the institutional sanitation facility intervention and does not fall under community reticulated systems

context at the national, regional, or local-district-municipal level. As such the tool seeks to determine the way in which Alliance interventions are integrated with broader systems for monitoring, support, technical back-stopping, policy and financing that go far beyond individual project activities.

As in the other two countries, namely Ghana and the Philippines, the evaluation is the first at scale pilot testing of the Sustainability Index Tool and this document presents the findings both from the field work, as well as lessons learnt about the design and application of the methodology.

2. WASH Sector Overview

The principal actor in the WASH sector in the Dominican Republic is the National Institute of Water and Sanitation (INAPA Spanish acronym). INAPA, based in Santo Domingo, is the authority for water and sanitation services throughout the entire country. However, INAPA only manages operations in 26 out of 32 provinces[8] with the remaining six provinces and the District of Santo Domingo managed by seven autonomous parastatal corporations. These CORAAs (Spanish acronym) were created to improve bureaucratic efficiency through delegation of management authority from INAPA to the CORAAs in the specified provinces. However, with few exceptions, the CORAAs have reproduced the same management model used by INAPA-centralized and top-down (Rodriguez, 2008). Both INAPA and the CORAAs work out of provincial capitals and concentrate their efforts on urban areas where coverage estimates are higher and economies of scale can be achieved. This has resulted in insufficient resources dedicated to extending and maintaining WASH services in rural areas. Table 2 shows the access levels to improved and unimproved services in the Dominican Republic as of 2010.

Table 2: Use of Drinking Water Sources in the Dominican Republic (WHO, 2010). Shown in bold is the focus area of the RI-USAID International H_2O Collaboration.

	Improved			Unimproved
	Total	Piped on Premises	Other Improved	
Urban	87%	80%	7%	**3%**
Rural	84%	54%	30%	**16%**
Total	86%	72%	14%	**14%**

INAPA and the CORAAs are mandated with the provision of water and sanitation services, however, significantly less attention is given to sanitation, especially in rural areas. There are over 10 times more domestic water connections as sanitation connections (Rodriguez, 2008). Although access to improved sanitation facilities is high compared to many other lower middle income countries (See Table 3) this is in large part to the due to geographical and climatic factors. High precipitation levels, topography conducive to facilitate rapid runoff, and proximity to surface waters (e.g. rivers, ocean) has permitted many urban centers to forego constructing sanitary sewers and/or wastewater treatment facilities. Nationwide there are only 29 wastewater treatment plants, while there are over 108 urban water systems. This means that households in medium and small towns discharge waste to soak pits, septic tanks, or very often directly into proximate water bodies. This has resulted in significant contamination of surface and groundwater- with as many as 87% of shallow wells testing positive for bacterial contamination (PNUD, 2008). Yet only 130 water treatment plants are in operation in the country, with an unknown number of small chlorination systems in use (Rodridguez,

[8] Currently serving approximately 45% of the population (Reyes, 2012).

2008). As a result, there is low confidence in the quality of piped water; up to 56% of the population relies on bottled water as their primary source of drinking water (ENDESA 2007).

In order to address these issues the Alliance interventions target the 14% of the total population that lacks access to improved drinking water sources through household water treatment and safe storage interventions and the construction of water systems in rural areas. Alliance interventions also target the 26% of the rural population that does not have access to improved sanitation through the construction of sanitation facilities.

Table 3: Use of Sanitation Facilities in the Dominican Republic (WHO, 2010). Shown in bold is the focus area of the RI-USAID International H_2O Collaboration.

	Improved	Unimproved		
		Shared	Unimproved Facilities	Open Defecation
Urban	87%	10%	1%	2%
Rural	74%	**13%**	**6%**	**7%**
Total	83%	11%	2%	4%

The Ministry of Public Health (MISPAS, Spanish acronym), through its Environmental Health Division, is charged primarily with regulating the bottled water industry, however it is also involved in household health and hygiene promotion[9]. This includes public service campaigns on household water treatment[10] and safe storage as well as health promoter training. Health promoter training includes a hygiene promotion component, but the principal focus is on vaccination campaigns as well as prevention campaigns for epidemics such as dengue, malaria, and cholera. The scope of work that health promoters take on largely depends on the monetary incentive that they receive from MISPAS, which varies between communities. MISPAS operates through its network of provincial health departments located in each provincial capital, in addition to the network of 9 regional hospitals, 47 provincial hospitals, 93 municipal hospitals, 46 urban clinics, and 676 rural clinics.

Although MISPAS, INAPA, and the CORAAs are the major stakeholders in the WASH sector, there are other ministries and government agencies that play a limited role in the sector. A complete list of these ministries is available in Appendix A. In general, inter-institutional coordination is weak and *ad hoc*, and typically institutions act independently due to the lack of an adequate coordination framework (Rodriguez, 2008). These institutions have been pursuing quantitative targets itemized as a part of the Millennium Development Goals and the 10-year Health Plan (2006-2015), often through plans that amount to lists of action items and fall short of being expanded into integrated and sustainable strategic plans for sector development (Rodriguez, 2008). Also there is little to no involvement of local governments. Each central governmental agency works within a top down system controlling activities on a local level.

2.1 Sector development

[9] The Dominican Republic is a member of the Central American Forum of WASH (FOCARD-APS). FOCARD-APS has a hand washing promotion campaign, although it is unclear what MISPAS role is in this campaign.
[10] This is limited to directions on how to boil water and chlorine dosing guidelines.

The general vision of the WASH sector is myopic and focused on new construction to the detriment of system operation and maintenance, service commercialization, and cost recovery. According to an internal presentation made by INAPA[11] the water and sanitation sector in the Dominican Republic has been plagued by a range of issues, including: inefficiency, large water losses, deteriorating distribution networks with high percentage of clandestine connections, low levels of metering and billing, a culture of non-payment for services (e.g.-electricity, water, sewer), low institutional memory, and high personnel turn over. Table 4 shows a list of internationally recognized indices for performance of water utilities along with suggested targets. It is clear that there is significant room for improvement and development in this sector.

Table 4: Internationally recognized indices and their respective performance targets for water utilities.

Index	INAPA*	CORAAs**	Target
Staff per 1,000 connections	22.4	13.0-15.4	5 or fewer[†]
Unaccounted for water	> 50%	n/a	23% or less[†]
Working ratio (income/expenses)	0.68	n/a	1 or greater[‡]
Water Potability Index	61%	90-99%	>95%[‡]

*-Source: Rodriguez (2008)
**-"CORAAs" here only includes data from Santo Domingo, Santiago, La Romana, and Puerto Plata.
[†]-Source: Tynan and Kingdom (2002)
[‡]- Source: UNICEF (2008)

The policy, legal, and institutional frameworks in the Dominican Republic fall short of providing the requisite enabling environment to foster sustainable WASH services. There is no policy or defined strategy to engage WASH service beneficiaries in decision making regarding service levels or needs prioritization. Strategic decisions on sector investment, employment, salaries, and tariffs are guided by political considerations rather than by principals of business efficiency (Rodriguez, 2008). In addition, a high level of political interference in INAPA operations and low financial autonomy has resulted in extreme financial dependence on the central government to meet costs, including: capital expenditures, wages, salaries, loan amortization and interest (Rodriguez, 2008). Furthermore, there is no coherent policy controlling sector subsidies, but rather a "supply driven subsidy" exists which negatively impacts the weakest areas within the sector (e.g.-sanitation). The management model that has resulted, beginning with INAPA in the 1960s and replicated by the CORAAs has been characterized by one Dominican expert as "subsidized inefficiency" (Rodriguez, 2008). Economic regulation and quality assurance/quality control is the responsibility of the same institutions that provide the services.

Sector reform initiated in 1997 emphasized "decentralization" of rural systems and the Rural Water Unit (UEAR Spanish acronym) was created within INAPA. Although termed decentralization, these efforts were really a basic form of professionalization of community management. UEAR promoted community management programs in an effort to transfer operation and maintenance costs and responsibilities of rural systems to the communities through the formation of Rural Water Associations (ASOCAR Spanish acronym). Despite the additional financial support provided by the Spanish government (AECID) beginning in 2001, UEAR has only been able to create legally recognized ASOCARs and decentralize systems in 140 communities to date. This represents only a fraction of

[11] Presentation given in June 2008 "Situacion General del Sector de Agua Potably y Sanaeamiento" cited as Rodriguez (2008)

the over 2,500 rural water systems that are estimated to exist throughout the country (Lockwood, 2002).

Pending legislation (Law No 1-12) would create a national policy and strategic plan for development in the water and sanitation (2012-2030). Included are sections that would regulate services and service provision; however the language of the current draft remains extremely vague. The proposed legislation is seen to complement a project funded by the Inter-American Development Bank and AECID, which emphasizes the decentralization of management and support of water and sanitation services. This 70 million USD pilot project is taking place in seven border provinces where coverage levels are the lowest. Although there is an institutional strengthening component to this project and initial outcomes have shown improved service, metering, payment, and user satisfaction in at least one major city (San Juan de la Maguana where 20 million USD has been spent) it is still unclear what changes have been made to address the weaknesses of the existing WASH strategy for rural areas.

In addition to the pending legislation, structural reforms have been occurring within INAPA. In the Rural Water Division (UEAR) the support provided by AECID was withdrawn, personnel were transferred to other divisions, and the budget was significantly reduced so that only administrative costs and salaries are now covered. With no operational budget, one engineer, five administrative staff, and eleven *extensionists*, UEAR must provide ongoing support to 140 rural water associations. This is in addition to the remaining communities with populations under 2,000 in the 26 provinces where INAPA maintains jurisdiction. The recent changes are seen as a setback to the decentralization accomplishments made to date (Andujar, 2012).

2.2 Sector financing and development partner landscaping

The WASH sector is characterized by both a strong presence of supporting organizations and external funding. Civil society is actively involved in the sector with at least a dozen international and national organizations supporting current WASH infrastructure construction projects[12]. The majority of organizations do not work in coordination with the public service authorities and provide little, if any, systematic follow-up support after implementation. The primary role of private companies in the WASH sector is the operation of bottling plants that sell drinking water in 5 gallon plastic *botellones* for 0.75-1.00 USD. Besides their commercial role, private companies also serve as construction contractors and project managers for government or civil society funded projects.

External funding plays a less important role in the Dominican Republic compared to other lower middle income countries. In 2010, the national budget was 9.4 billion USD and only 176.5 million USD in official development assistance was received (World Bank, 2012). Recent aid packages with WASH components include: World Bank's 360 million USD portfolio (2006-2009) focused on institutional strengthening (10M), social investment (50M), community development (30M), and water and sanitation (10M) and the United Nations' 100 million USD (2007-2011) program promoting democratic governance, equality, social services, environmental protection and climate change risk mitigation. Although these examples represent significantly larger aid packages compared to the Alliance, it is important to recognize the opportunity to leverage funding and harmonize activities to increase potential for sustainable services provision.

[12] Visit http://www.devdir.org/files/Dominican_Republic.PDF for a complete directory of development organizations working in the Dominican Republic

The National Planning Office (ONAPLAN) is the government agency that coordinates all public spending and together with the Sub-secretary of International Cooperation regulates all international aid agreements. A document released by the World Health Organization confirmed that there remain structural and functional weaknesses in the Dominican Government that limit results of programs and projects and the impact on the population (WHO/PAHO, 2007). Most aid is directed at achieving the MDG and as such has a project (e.g.-new construction) focus. In addition, most of the aid is bilateral and harmonization between projects in the same sector is limited. In an effort to improve this, the Dominican Agency for International Cooperation was created, however little progress has been made in aligning and harmonizing donor and partner agenda and activities. This is an important step in making the shift away from a donor driven project approach to a service delivery approach.

3. Sustainability Index Methodology and Sampling

3.1 Sustainability Index Tool

The Sustainability Index Tool is a framework to assess the likely sustainability of water, sanitation or hygiene interventions after they have been implemented. The check considers four main factors that are known to have an impact on sustainability: institutional arrangements, management practices, financial conditions, and technical operations and support. Although the tool was developed globally, it is also necessary to customize indicators – and the associated questions - to specific intervention and country contexts. For example, in the Dominican Republic, the wording of some indicators was modified to match the components of the different interventions.

The extent to which these sustainability indicators are being achieved is assessed through a series of indicator questions aimed at different stakeholders and institutional levels, and in some cases through review of relevant legislation and sector policy. Although these levels may vary depending on the type of intervention and country context, they typically include: households, service providers (e.g.. the water committee, utility or school), district level, and national level. The sources consulted at each level of research for the Dominican Republic are identified in **Table 1**. These sources were consulted for each of the communities in which an Alliance intervention was implemented.

Table 1: Stakeholders, Institutions, and Major Legislation Consulted at each Investigation level.

Type of Intervention	Household/Project level	Service Provider Level	District/Support Authority Level	National Level
Household Water Treatment	Households	Community Facilitators	DPS* FUDECO, MUDE (Bateys)	INAPA
Community Reticulated System	Households	Water Committees	INAPA (UEAR) CORRAs	INAPA MMARN
Hand washing Promotion	Households	Community Facilitators (Rotary) Community Health Promoters (Bateys)	DSP PCDR UNAP MUDE Local NGOs	MISPAS

Shared/Household Latrines	Households	N/A	MUDE	MMARN MOPC
Institutional Latrines	Latrines	School Administration Parents Associations	MUDE	MMARN MOPC MINERD (document review)

*There were no specific questions for this intervention guided at the district level, but these sources were consulted during the interviews about the hand washing promotion intervention and provided some useful information regarding the household filters

At the household, or system level, information was gathered through a series of household surveys in each of the communities receiving the intervention. Questionnaires were developed based on the indicator questions for each intervention and were piloted in April 2012. These questionnaires are available in Annex 3. During late April and early May, two enumerators and a field coordinator were trained to conduct household interviews and reporting information into data sheets for eventual transfer into digital files for analysis.

Information at higher levels was obtained through a series of interviews based on the indicator questions. A full list of people consulted is in Annex 6. To answer some indicator questions relating to national policy and legislation a desk review was carried out and verified by interviews with key stakeholders at national level and supplemented with the team's own knowledge of the WASH sector. Section 4 describes how the answers for these indicator questions was used to determine indicator scores and then aggregated to show sustainability scores by factor.

3.2 Sample size and selection of communities and households for surveying

The sampling protocol used in the Sustainability Index Tool is based upon accepted guidelines and incorporates best practice methods from relevant monitoring and evaluation literature in the WASH sector. This protocol, summarized in Annex 2, is composed of multistate sampling that utilizes stratified sampling to identify the sample frame at the service provider level (e.g.-communities and/or neighborhoods) and random sampling to identify households where dictated by the Sustainability Index Framework. Each uniquely coded data collection tool has a specific primary unit of analysis, which at the service provision level includes: households and service providers (e.g.-water committees, hygiene promoters, community facilitators). Sampling was used to characterize household/user opinions and behaviors. When the primary units of analysis is not the household, data collection was inclusive, including all relevant individuals. In other words, all service providers in a community will be surveyed, but not all households (only a sample of households were surveyed). Please see Annex 2 for a detailed explanation of the sample size determination protocol.

3.3 Geographic spread of surveys

In the Dominican Republic the smallest administrative unit is the *paraje* (village) in rural areas or *barrio* (neighborhood) in urban areas. Some interventions in the DR have targeted the *paraje/barrio* level while others have targeted the administrative level above these, called the *session*. However,

it was determined that in the DR the sample frame would be based on the smallest administrative unit, hence forth referred to as *"community."* After the review of project documents an inventory was created with information about the type and number of interventions, beneficiaries, etc. A map was created showing the location of each community and it was determined that geographic stratification would be based on Region (North, South, and East)[13]. Additionally within each region the communities were further stratified into rural (2,500 inhabitants or less) or urban (greater than 2,500 inhabitants) communities based upon 2010 census figures[14].

For each intervention type communities were randomly selected within each of the six strata (e.g.-Rural East, Urban East). Selection continued taking into account communities with multiple interventions and also considering available resources and other constraints. This resulted in a final list of communities (i.e. sample frame) that is geographically representative (e.g. each of the three regions: North, South, and East) and also reflected rural and urban differences. The breakdown of sample frame by stratum is shown in the **Table 5** (below).

Figure 1 (overleaf) shows a map of the sample frame as well as all communities where interventions have taken place.

Table 5: Number of communities, overall and sample frame, divided by strata.

Number of Communities	East		North		South		
	Rural	Urban	Rural	Urban	Rural	Urban	Total
Overall	16	11	66	40	4	2	139
Sample Frame	4	2	6	4	1	1	19

[13] This is the basic regional division used by many government ministries (e.g.-Coorporacion Dominican Empresas Electricas Estales)

[14] To allow for standardization across countries the definition of rural and urban used for the Sustainability Index is based on a commonly accepted values (Sara and Katz 1997) and does not necessary reflect the administrative classification scheme used in each country.

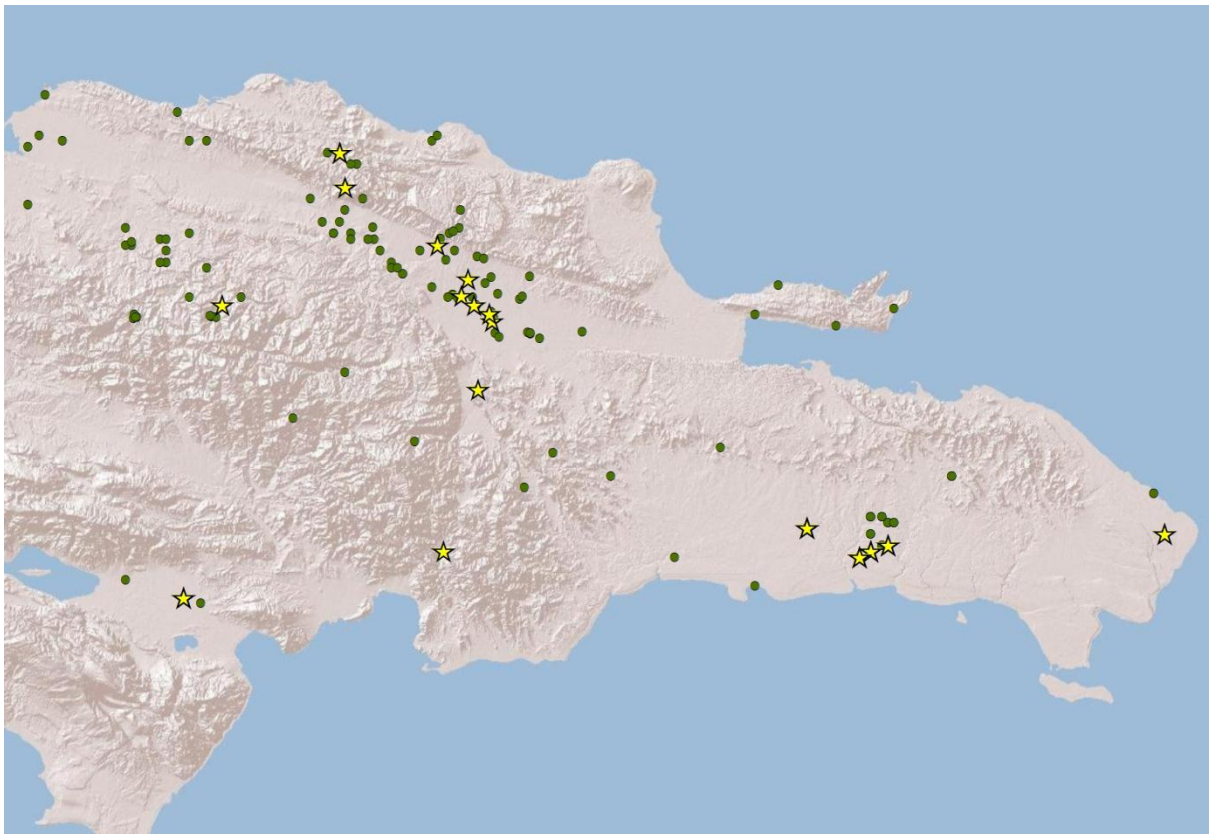


Figure 1: Map of communities where International H_2O Collaboration interventions have occurred. Stars identify the location of the 19 communities that were selected for the sample frame.

From the comprehensive inventory, community data was aggregated by intervention type for those interventions where the primary unit of analysis is the household. In the Dominican Republic this includes: household and shared latrines, hand washing and hygiene promotion and household water treatment. Utilizing the statistical parameters a minimum household sample size was calculated for each intervention type **(see Table 6).**

Table 6: Calculated Minimum Sample Size per Intervention Type

Intervention Type	CRS	HHL	INL	HWP	HWT	Total
Population (N)	4228	1502	2500	50982	35000	35000
Calculated Sample size (n)	n/a	141	n/a	153	153	
Number of Household Surveys	181	160	N/A	501	282	1,124

The target number of household surveys to be conducted in each community in the sample frame is based upon established best practice: a minimum of 15 surveys in rural communities and 25 in urban communities. Where necessary more surveys were conducted to achieve the statistically calculated sample size for HHL, HWP, and HWT shown in **Table 6**. However due to the nature of programs in the DR, there is significant overlap between interventions. For example, HWP is a component of all interventions (CRS, HHL, and HWT) and often households with latrines (HHL) also have water filters (HWT) and/or access to water systems (CRS) constructed through the Alliance.

4. Results of Data Collection

4.1 Data for key sustainability factors by intervention

To arrive at sustainability scores by factor for each intervention, a series of aggregation steps was carried out. Firstly, answers to indicator questions were scored based on the data collected from households and institutional interviews in order to determine overall indicator scores for each community. These indicator scores were then aggregated (averaged) by their factor (institutional, management, financial and technical), to yield factor scores, which are presented in this section, both by individual community (spider diagrams) and as average factor scores across all communities (bar charts). The individual indicator scores can be seen in **Annex 5**, but are not detailed here.

To complete the first step of arriving at answers for indicator questions informed by households, household data was digitized and cleaned. All data that were not collected as dichotomous (Yes/No) responses were coded to allow for entry into the framework. The total percentage of "Yes" answers was determined, excluding responses that were not applicable or where the respondent didn't understand the question or know a response. This percentage was used as the aggregate household score per community per question. The percentage was compared to a threshold of 66%, such that if at least two thirds of respondents in a community responded "Yes", then the appropriate score for "Yes" to that indicator question was awarded. This data was entered into the framework along with the individual responses from the service provider (e.g.-water committee survey), district stakeholder, and key national level personnel.

The same questions were sometimes asked at multiple levels in order to triangulate responses. After careful consideration it was determined that the lowest level response would be used as the default for determining scoring. In other words, unless otherwise noted, the source that is closer to the household level would be the final response. So composite household responses are used over service provider response and service provider responses are used over service authority responses. Section 5.3 discusses triangulation in greater depth.

In many cases there was no apparent authority at the district level. In these cases an attempt was made to identify national or regional level stakeholders serving some of the supporting roles in place of a district authority. In most cases this role is somewhat taken on by the implementing partners (e.g.-FUDECO, MUDE) or community access partners (e.g.-Peace Corps Volunteer, other NGOs). Information was thus gathered from knowledgeable individuals working for these organizations. When possible, this information was triangulated with other sources and confirmed by the country coordinator and field manager. For a complete list of the key stakeholders interviewed see Annex 6.

4.1.1 Intervention: Community Managed Reticulated Water Supply

Six community reticulated water supply systems in six different communities were included in the evaluation. The Sustainability Index scores are shown in the **Figure 2,** below. The average institutional factor scores were highest (70%) followed by those for technical (67%) and management (58%) factors. The financial factor scores were the lowest (37%). Most notable is the clear lack of national or local mechanisms to account for and meet the full life cycle costs of the services. As the service authorities (INAPA and CORAAPLATA) work out of centralized locations and

have very little district presence the financial scores for the district level were the lowest of all indicator scores for CRS (0 out of 100 points).

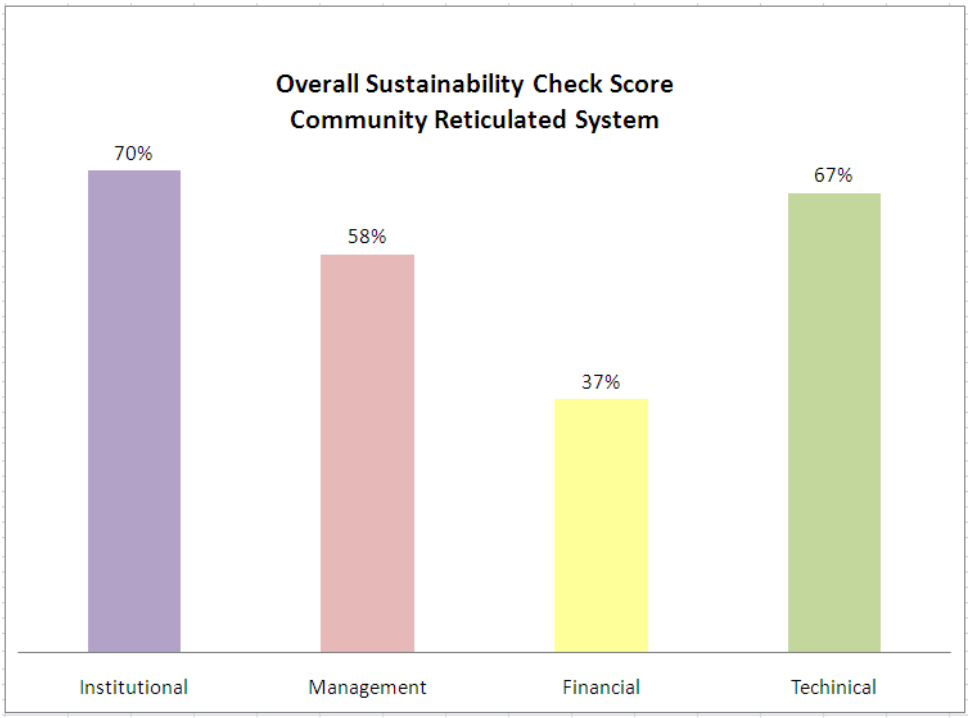


Figure 2: CRS Overall Sustainability Index Scores

The general trend observed for CRS is decreasing sustainability scores as you move away from the community (i.e. - from the community to district and from the community to national), with notable weakness at the district level. This reflects the reality that the technical, financial, and managerial burden rests on the shoulders of the service providers-in this case members of the water committees of which, the majority perform their duties without remuneration. For technical factors the lowest average indicator scores were for equipment standardization norms/arrangements for providing spare parts, and in the knowledge and spare parts availability to conduct maintenance and repairs in a timely manner. Management indicator scores at the district level were the lowest reflecting the low capacity for monitoring and follow-up support by local government and an essentially non-existent budget for these activities. Of the three institutional indicators there was a limited difference observed between levels. For a complete list of indicator scores for CRS and other interventions see the Sustainability Frame Check in **Annex 5**. The Sustainability Index scores disaggregated by community are shown below in **Figure 3**.

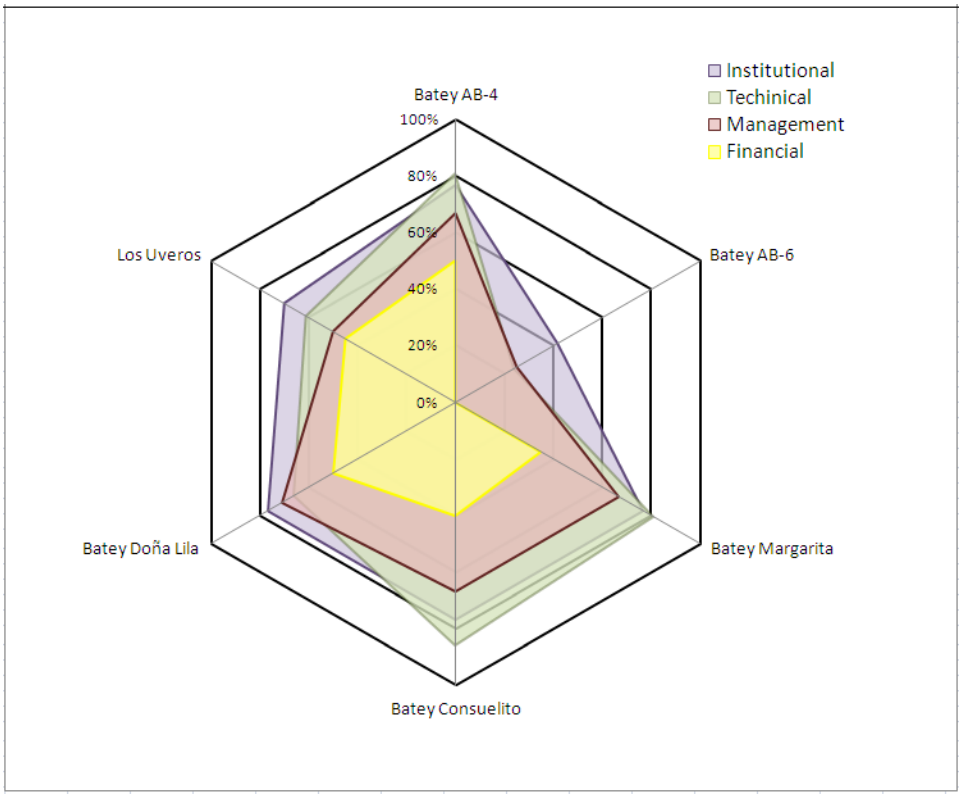


Figure 3 CRS Overall Sustainability Index Disaggregated by Community

Most notable of Figure 3 are the low factor scores for Batey AB-6. This is because the water system has been broken down for a number of months and no water committee had been formed in the community. Furthermore, excluding Batey AB-6, there is a difference between the *bateys* and the Rotary funded water system in Los Uveros. The implementation model used in Los Uveros varied significantly in terms of budget, paid personnel, and community involvement from the model used in the Batey Community Development Project.

Amongst the *bateys* the institutional scores were rather symmetric across all communities (excluding AB-6). This is due to the fact that all the *bateys* are in the same district, and are in the jurisdiction of the same INAPA regional supervisor. Los Uveros is in a different region and uses different training materials and water committee requirements. The management indictors (monitoring and support) although low in general, were lowest in Los Uveros (once again excluding AB-6) resulting in a lower management factor score. This could represent the limited capacity of the provincial authority for Los Uveros (CORAAPLATA) or the degree to which this project was integrated into the existing post-construction support system in this area .

4.1.2 Intervention: Household Latrines

Six communities were visited in the evaluation of household latrines. All six of these communities are considered under the Batey Community Development Project and are located in the same session (Consuelo) in the Province of San Pedro de Macoris. Overall the sustainability scores were very low for this intervention (see Figure 4). Technical factor scores were the highest (51%) followed by institutional (25%), management (13%) and financial (0%). This is indicative of the sanitation sector in general, as financing and management of sanitation throughout the country is left almost

completely up to the household. No sanitation plans have been articulated at the district or national levels (indicators I-D1 and M-D2) and no system is in place to provide support to households or districts (M-N1). Currently there is some monitoring and promotion activities taking place under the project, but these activities will terminate at the conclusion of the project in 2013.

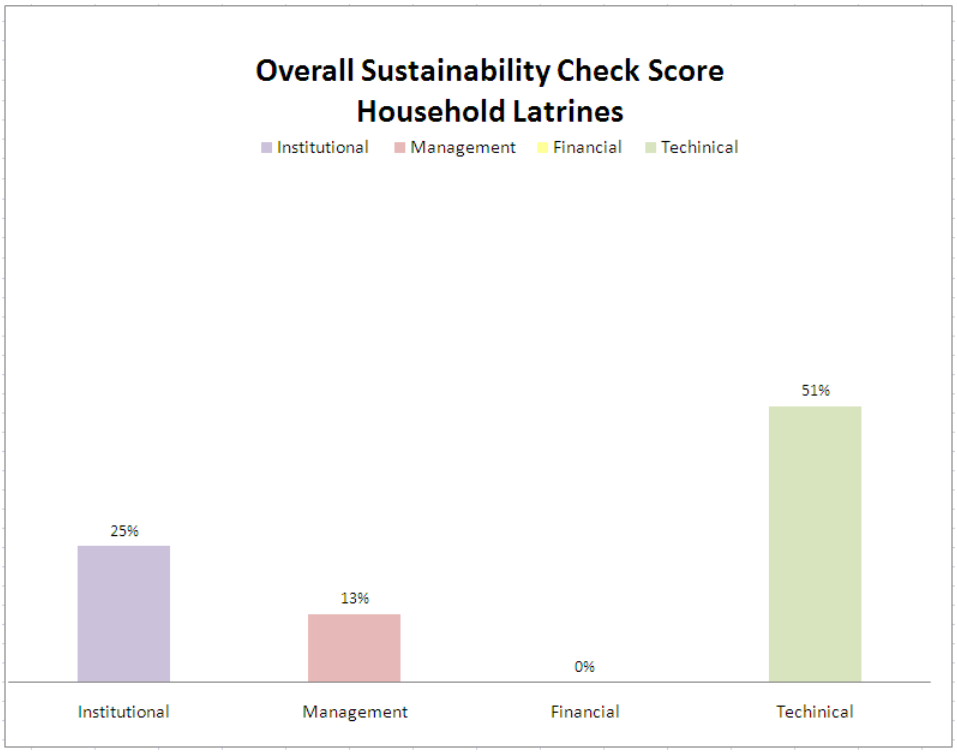


Figure 4 HHL Overall Sustainability Index scores

The disaggregated Sustainability index scores are shown in Figure 5. Community scores are symmetric for management and institutional factors since the enabling environment is similar across the communities within the same district. The technical factor scores ranged between 40-60% which reflects numerous technical differences (e.g. siting, crowding) as well as social differences (e.g.-value placed on the latrines by the households) between communities. In all cases the households were unclear what the long term operational and capital maintenance costs would be (F-SP1). The *status quo* for latrines at the end of their useful life is to decommission them by covering the hole and moving superstructure and thus the "lifespan" is considered complete. This is discussed further in the risk factors of sustainability section. Pit emptying services do not formally exist, and sludge removal services for septic tanks and soak pits is incredibly limited and not professionalized. The lack of solids removal services for HHL resulted in low sustainability index scores for numerous indicators (M-SP1, F-SP1, T-D1). (See the Sustainability Index Framework in Annex 5 for a complete list of indicator scores.)

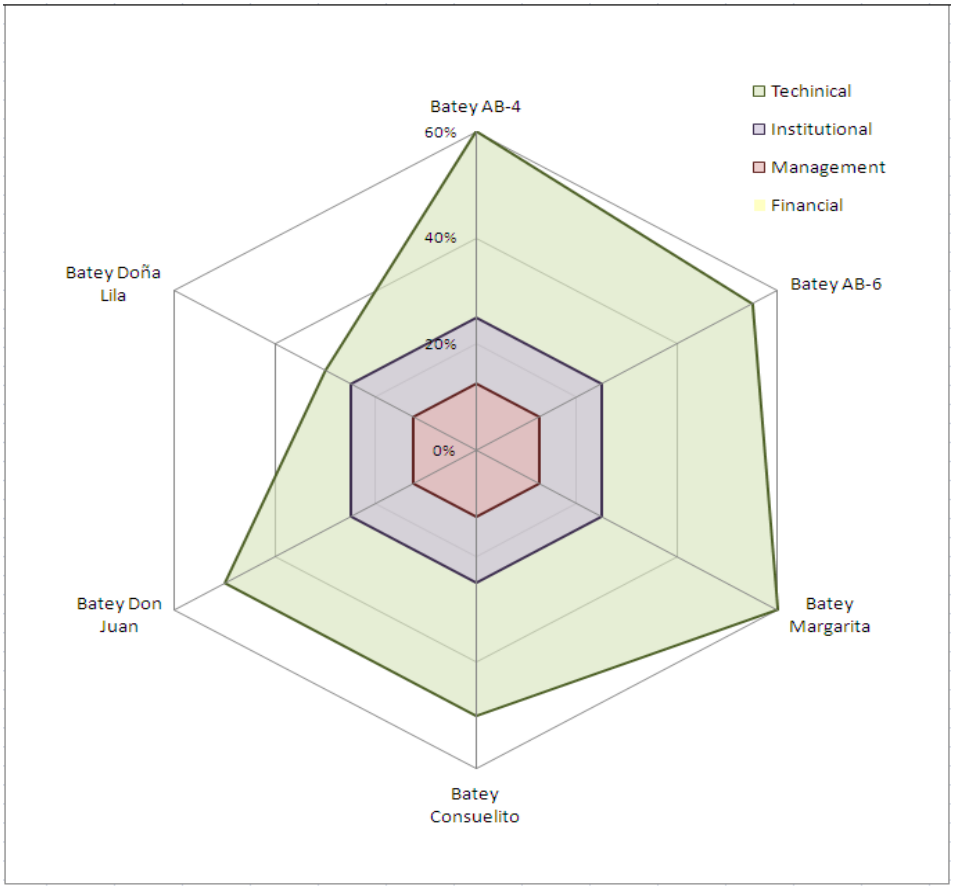


Figure 5: HHL Overall Sustainability Index Disaggregated by Community

4.1.3 Intervention: institutional sanitation facilities

Four communities, located in three provinces, were visited in the evaluation of institutional sanitation facilities (INL). These facilities are located at primary schools and consist of fully plumbed bathrooms with toilets and sinks that drain to septic tanks. Two of the four facilities (Batey 3 and Hoyo de Fruisa) had independent bore holes with submersible electric pumps and the others were connected to CRS. Unlike the all other interventions no data was collected from the user. In each community interviews were conducted with the maintenance personnel, school principals, teachers, and where possible the parent's association (APMAS). See **Annex 6** for further information.

Figure 6 shows the overall sustainability index scores. Similarly to household latrines, the sustainability scores for INS were low for institutional (8%) and management (36%) factors. Also, like HHL, technical factors were the greatest contributors to the sustainability of INL (69%). Unlike HHL, the financial factor score for INL was relatively high (47%). The divergence in financial factor score can be attributed to the difference in stakeholder landscape for community sanitation verses household sanitation. INL indicator scores suggest that schools have a greater ability to meet long-term operational, minor maintenance and capital maintenance costs compared to individual households.

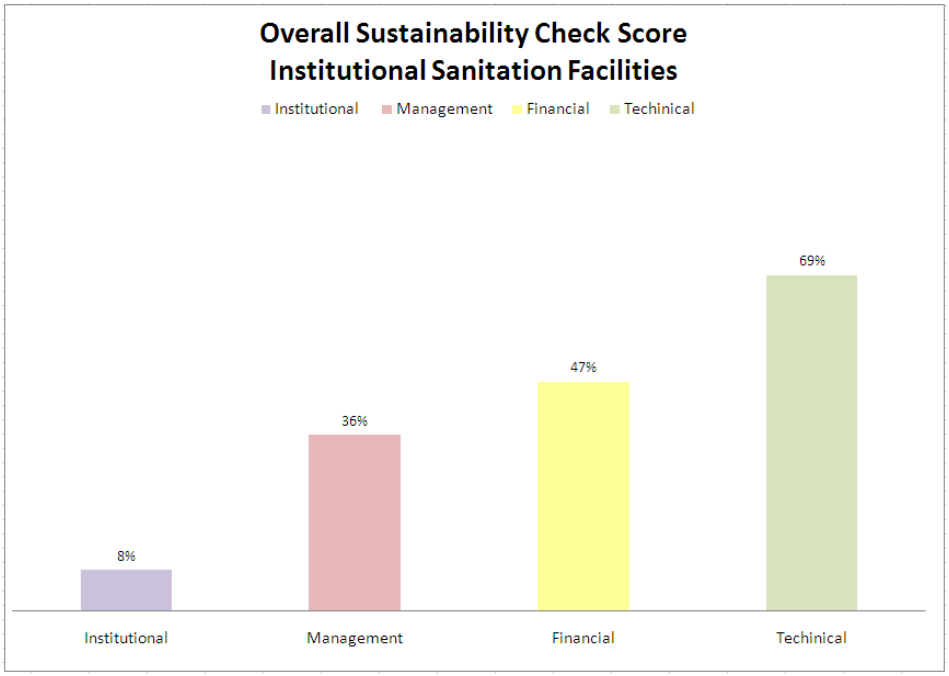


Figure 6: INS Overall Sustainability Index Scores

The disaggregated Sustainability Index scores are shown in **Figure 7** Community scores were the same for all institutional indicators. With no sanitation plan the roles and responsibilities of stakeholders are unclear (indicators I-D1, I-N1). In the absence of a developed regulatory framework for sanitation, septic pumping services have not been professionalized and indiscriminant dumping is inevitable (M-SP1). The scores for management were similar in all communities. Service providers (schools) acknowledged their responsibility for emptying septic tanks and at the same time were able to identify stakeholders at the district level (e.g.-town mayor, city council) and national level (e.g.-ministry of education) with the capacity and vested interest in subsidizing these costs (F-SP1 and F-N1). However the process for procuring funds from these organizations isn't clear and often the funds are distributed unequally or not at all. In some communities the Ministry of Education provides a limited budget for consumables (cleaning supplies, soap, toilet paper) and funds to pay a maintenance worker, while in other communities these funds are withheld (T-D1). In general, the technical factor scores were high for all communities. Detailed standards and norms exist for the construction of schools and their related infrastructure, and the sanitation facilities evaluated tended to fall in-line with these criteria (T-SP1).

Figure 7: INS Overall Sustainability Index Disaggregated by Community

4.1.4 Intervention: Household Water Treatment (Bio-sand and Ceramic Filters)

Household water treatment interventions occurred in every community visited in this evaluation. At the time of the evaluation it was believed that the promotion of ceramic water filters was limited and only occurred in a few communities as part of different pilot projects to compare POU treatment technologies for reasons discussed in more detail in the Partnership Assessment. However, after completing the field data collection, a document was obtained[15] that describes the extent of CWF promotion in the *bateys.* From this document it was learned that at least 881 ceramic filters were distributed in nine communities between 2009 and 2010. Five of these nine communities were visited during the evaluation, and out of the 465 filters that were distributed to households in these communities[16] enumerators only encountered 29 households that cited owning a ceramic filter. Of these 29 households, only 11 (38%) were considered to be using the filters. The 2010 report was foreshadowing to the Sustainability Index evaluation as it revealed a high breakage rate (12%) and a low knowledge of proper maintenance (11%) (Mercedes, 2010). This could be due to the fact that only 18% said they received formal training on filter use and maintenance.

[15] Estudio sobre la Calidad de Agua en Proyecto de Desarrollo Comunitario en Bateyes FUDECO-Save the Children y Mujeres en Desarrollo (MUDE) by Manual Mercedes.

[16] According to FUDECO there are 488 households in Dona Liila, Don Juan, Consuelito, AB-4, and AB-6 combined. Thise means that 95% of household received filters.

As previously mentioned, the implementation model for bio-sand filters has been tested and improved over the past decade. Due to the substantial difference in energy and effort devoted to training community facilitators in the specifics of BSF technology verses what appeared to be a more ad hoc approach to the introduction/distribution of CWF, it was determined that the bio-sand and ceramic water filters were analysed separately. In addition, due to the extremely limited number of CWF still in use, the surveys for CWF were analyzed in aggregate(see Figure 10). Similarly, there were so few BSF in use in the *batey* communities in the East (AB-6, Batey Margarita, Dona Lila, and Hoyo de Fruisa) that these were also analysed in aggregate and are presented as "Save/MUDE" communities.

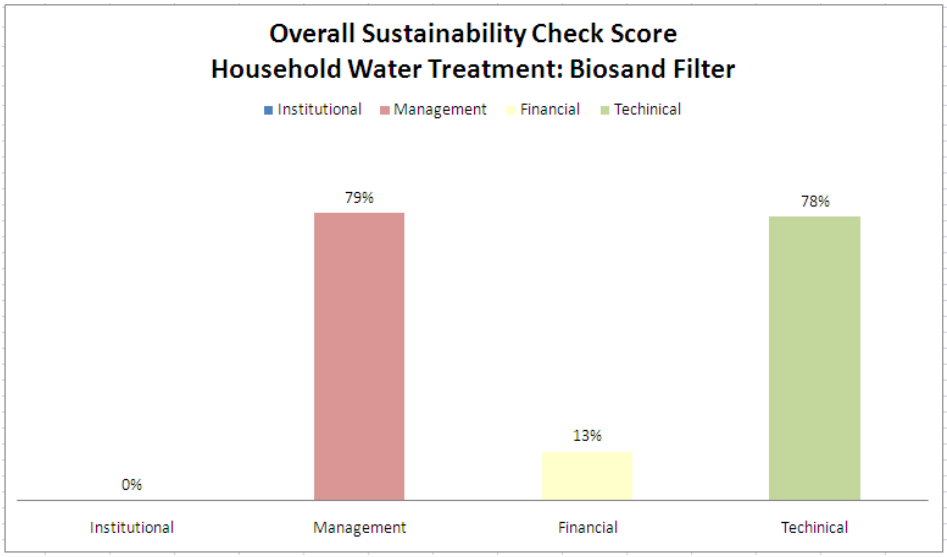


Figure 8: HWT-BSF Overall Sustainability Index Scores

Figure 8 (above) shows the overall sustainability index scores. Scores were highest for management (79%) and technical (78%) factors and low for financial (13%) and institutional (0%) factors. Currently there is no national policy or agency regulating point of use treatment technologies and the Ministry of Health has been unwilling to officially support either HWT technology despite the efforts of Rotary District members. The lack of government involvement results in low scores for the national indicators (I-N1 and F-N1). In addition, filters and replacement parts are not currently available and the filters are currently highly subsidized resulting in low financial indicator scores at the district level (F-D1). Indicator scores at the service provider level were considerably higher than those at the district and national level.

The disaggregated sustainability index scores are shown in **Figure 9** (overleaf). The most notable aspect is the difference between Rotary and the USAID *batey* communities. The amount paid for filters in *bateys* was significantly lower than in Rotary communities (indicator F-D1c) and in the eastern *bateys* (e.g.- "Save/MUDE") the knowledge of correct use of filters was low (T-SP1) as was the number of families practicing safe water storage (T-SP2). In most communities, the community facilitators (CF) have the capacity to monitor and provide regular follow up support (M-SP2) and they are adequately supervised by the community access partner and/or Rotary Project Coordinator (M-D1).

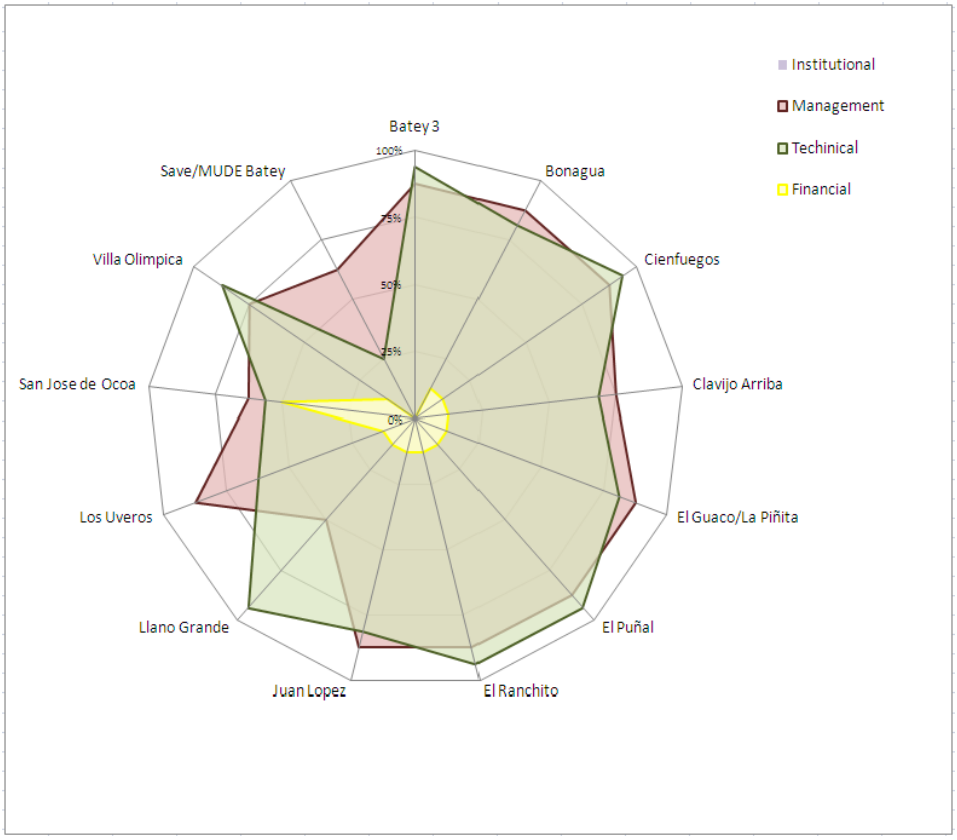


Figure 9: HWT-BSF Overall Sustainability Index Disaggregated by Community

Initially it was understood that ceramic water filters were promoted in the *batey* communities on a limited basis (~50) as a part of two different pilot studies[17] performed in Spring of 2009 and Fall of 2011. Due to the turnover of key personnel in USAID implementing partners, information on exactly how many filters were distributed and the location of the filters was unclear and therefore it was questionable whether it would initially be included in the analysis. During household visits, a total of 29 CWF were encountered in the *batey*s of Dona Lila, Don Juan, and Batey Margarita. Although the household surveys had not been contextualized to take into account the differences between BSF and CWF, the surveys were none-the-less utilized. It was necessary to modify the final framework to facilitate the analysis. The overall sustainability index scores for the 29 ceramic water filters is shown in **Figure 10**.

[17] In 2009 the CEO of SCUS conducted a pilot test with approximately 20 BSFs and 20 CWFs in Bateys Cachena and Dona Lila. In 2011 after the CEO left the issue was raised again as to which filter to promote, and 20 BSF filters and CWFs were distributed in Batey Margarita. In 2012 Rotary requested that a third pilot be conducted in La Altagracia to determine the acceptability of BSF filters to the saline ground water.

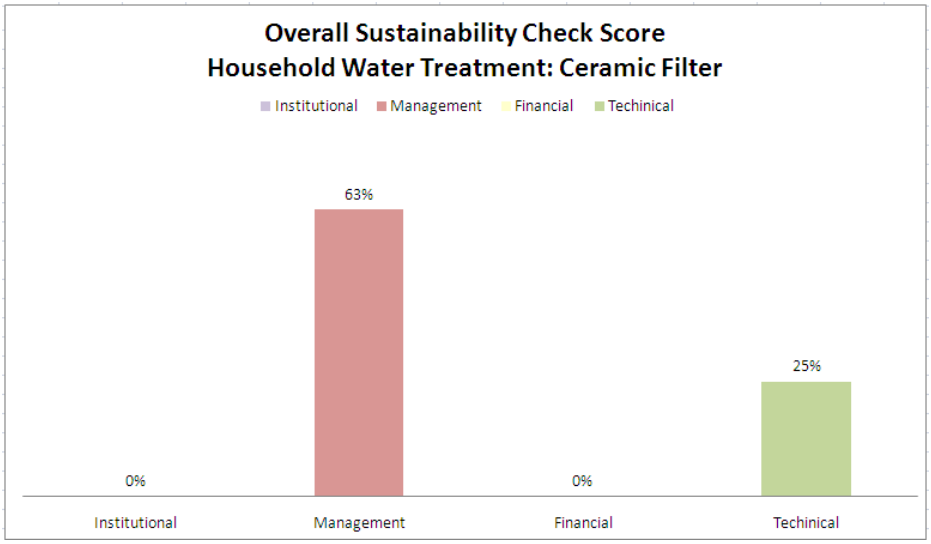


Figure 10 CWF Overall Sustainability Index Score

Sustainability scores were lowest for institutional (0%) and financial (0%) for the reasons previously mentioned for bio-sand filters. Management factors were the highest (63%) followed by technical factors (25%). Similarly to biosand filters, the sustainability scores at the community level were higher that at the district and national levels, although the technical scores for ceramic filters was significantly lower than for biosand filters. Usage rates were much higher for BSF (93%) compared to CWF (31%), resulting in lower scores for indicator T-SP3. It is important to note that this figure for CWF does not take into account the information provided *post facto*. When taking into account the 465 filters that were distributed in the communities visited the usage rate drops to 2%. Usage was defined as using filtered water for drinking at least once a week.[18] Knowledge of correct use of CWF and household storage and safe water practices were also lower in CWF households (T-SP1 and T-SP2).

4.1.5 Intervention: Hygiene Promotion and Education

At the outset of the evaluation, the activities surrounding hygiene promotion were the most nebulous of all interventions. Project documents initially obtained mention hygiene training as in relation to filter installation. For the purposes of determining sample size and community selection for HWP it was assumed that all project beneficiaries received some kind of hygiene training and therefore each household survey conducted in this evaluation included the HWP questions. Service provider questions were asked of the community facilitators (Rotary communities) and/or health promoters (USAID communities). District level questions were asked of stakeholders from the primary care rural clinics (UNAP), Provincial Health Department (DPS), or appropriate medical professionals in the area. National level data was collected from representatives of Ministry of Health. (For a complete list of interviewees see Annex 6).

[18] Stauber 2010 categorizes use into optimal (at least once a week for drinking and something else), sub-optimal (at least once a week for drinking only), poor (at least once a week but not for drinking), and no use (less than once a week). For coding purposes "usage" (score=YES) was defined as optimal or sub-optimal use.

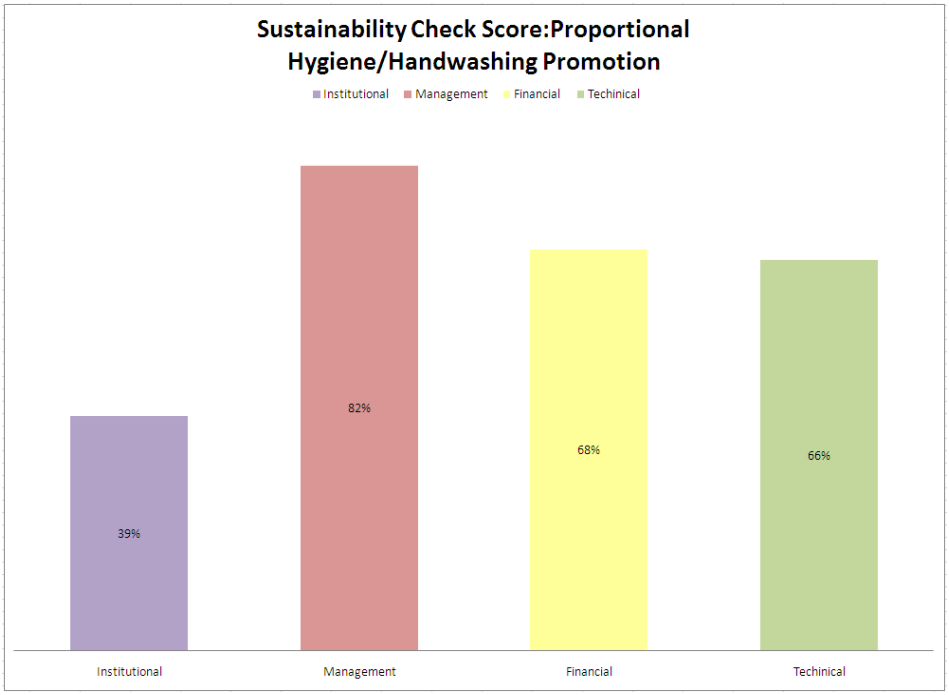


Figure 11: HWP Overall Sustainability Index Scores

The overall sustainability scores for hygiene promotion are shown in **Figure 11**. For the 19 communities combined, the overall scores were high; management (82%) and financial (68%) factor scores were the highest of any other intervention. Scores for technical (66%) and institutional (39%) were also high relative to other interventions. As with other interventions the lowest indicator scores were at the national level (I-N1, I-N1, and F-N1).

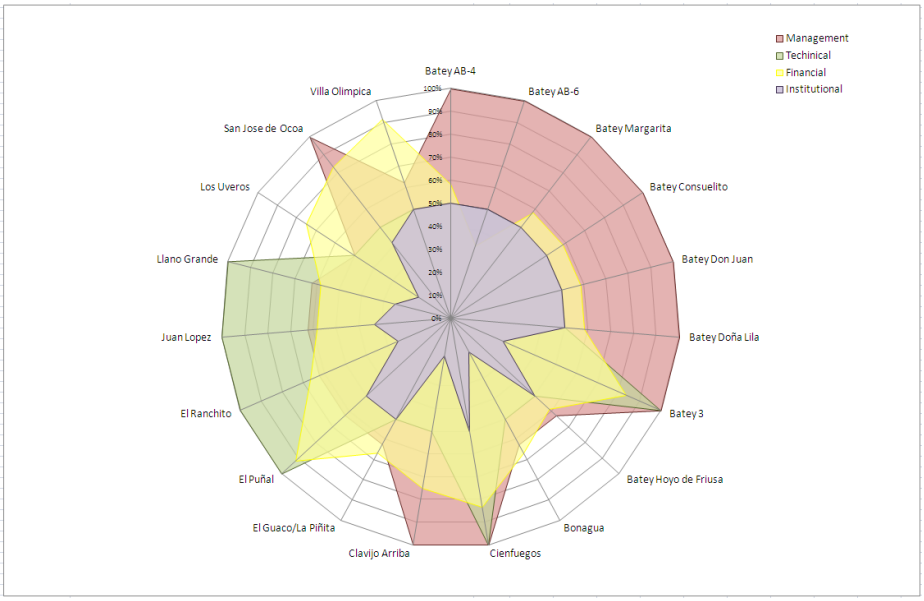


Figure 12: HWP Overall Sustainability Index Disaggregated by Community

Figure 12 shows the sustainably scores disaggregated by community. *Batey* communities generally had higher management and institutional scores than Rotary communities, but had lower scores for financial and technical. In general terms this is due to the fact that HWP intervention in USAID

communities fell within the context of a larger health intervention that was a major component of the total Batey Community Development Project portfolio. Amongst the HWP related activities listed in the current annual implementation plan are: consultative meetings with MISPAS, 26 community-based trainings, 78 community hygiene and environmental health days, as well as school health and nutrition trainings for teachers. With a larger budget *batey* community health promoters received more in-depth training and monitoring and support follow-up (M-SP1 and M-D1). Coordination with the district authority was much more thorough and systematic (I-D1). However the willingness and ability to pay for hygiene products was lower in *batey*s (F-SP1) as was the availability of these products (F-D1). In addition, the acknowledgement of hand washing and correct use of facilities was on average higher in Rotary communities (T-SP1) which is not necessarily a direct result of Rotary training but could reflect socio-economic, cultural, or other differences amongst the communities.

5. Analysis of Findings

In the context of this evaluation, a higher Sustainability Index score for any given factor signifies a larger contribution to the sustainability of the intervention than a lower score for the same factor. However all factors and indicators may not have equal influence on sustainability for any given intervention. In addition these indicators and factors do not exist in isolation, so scores for one factor are related to and may influence scores for another factor or indicator. The subsequent sections discuss these issues in greater detail.

5.1 Primary drivers of sustainability

Across all interventions, the Sustainability Index scores were the most consistent and generally high for the technical factors (see Table 6 and Figure 13, below). Out of nineteen technical indicators, fifteen were directed at the service provider level. SP technical indicator scores ranged from 44% to 100% (average 72%) and reflect the strong emphasis in the WASH sector commonly placed on the function of interventions (i.e.-construction of infrastructure, knowledge of correct use/practices, usage, and maintenance). Although these factors are important in understanding the status or impact of different interventions, these may not be the most important drivers of sustainability.

Management factors were the second highest contributor to sustainability, although there was significant variation in these factor scores. Indicator scores ranged from 0% to 99% (average 48%). Some interventions scored well (HWT and HWP) and others did not (HHL and INL). This is due to the level of integration of these interventions into the existing district/provincial management and support structures (e.g. - provincial health department for HWP). In the case of sanitation these structures do not exist. As a result, sanitation interventions had the lowest management indicators scores at all levels (SP, DL, NL). For hygiene the greatest contributor to the management factor score was the presence of a community facilitator/health promoter with the capacity to monitor and provide regular follow-up support to households and, at the district level, the capacity to monitor and support this community facilitator or promoter. This follow up is crucial to ensure that the behaviors observed during this evaluation continue into the future.

Experience in the WASH sector suggests that management indicators at the district and national level are integrally connected to the long term sustainability of WASH services. The importance of monitoring and post-construction support in CRS is well documented (Lockwood 2002; Harvey and

Reed 2006) and various case studies have also demonstrated the importance of national ministries providing capacity support to service authorities that operate at the local level (Lockwood and Smits, 2011). In the Dominican Republic the only national ministry with a decentralized presence is the Ministry of Health. Sustainability scores were higher in Alliance communities where the activities (e.g.-HWP or HWT) were integrated leveraging (UNAP or DPS personnel) or by piggy-backing on their programs. For example, in San Jose de Ocoa, the Rotarian in charge of the BSF project was an epidemiologist at the DPS and was able to integrate filter distribution using DPS field workers. Filter distribution was integrated into an existing outreach program which included an assessment of household water storage practices to evaluate for risks of dengue.

Financial and institutional scores were significantly lower. Financial indicator scores range from 0% to 95% (average 39%) while institutional indicators ranged from 0% to 71% (average 33%). A complete listing of the indicator scores by factor can be found in **Annex 8**. Although these scores are generally low, these indicators are important drivers of sustainability. Lessons learned over the past few decades demonstrate that communities cannot function in financial isolation. To ensure durable WASH services it is necessary to account for the life-cycle costs. Communities have limited economic means and financing capabilities and therefore financial and strategic planning must be facilitated by the service authority and/or central government.

Currently the district and local budgets and mechanisms to meet the full life cycle costs of interventions are inadequate (Indicators F-N1 F-D1). For sanitation interventions this is a direct reflection of the lack of national policy and a vacuum of institutional authority. For other interventions this reflects the limited budget managed by local and district governments. In the case of CRS, INAPA operates at the national level essentially working around local governments. In many communities where financial scores and institutional scores are high (and as previously mentioned with management indicator scores), the intervention activities were integrated into existing programs of the local government. Such as the HWP programs in the *bateys*.

Table 6: Overall factor scores by intervention for the Sustainability Index.

	HWT	CRS	HWP	INL	HHL	average	Standard Deviation
Institutional	0%	70%	39%	8%	25%	29%	28%
Management	79%	58%	82%	36%	13%	53%	29%
Financial	13%	37%	68%	47%	0%	33%	27%
Technical	78%	67%	66%	69%	51%	66%	10%

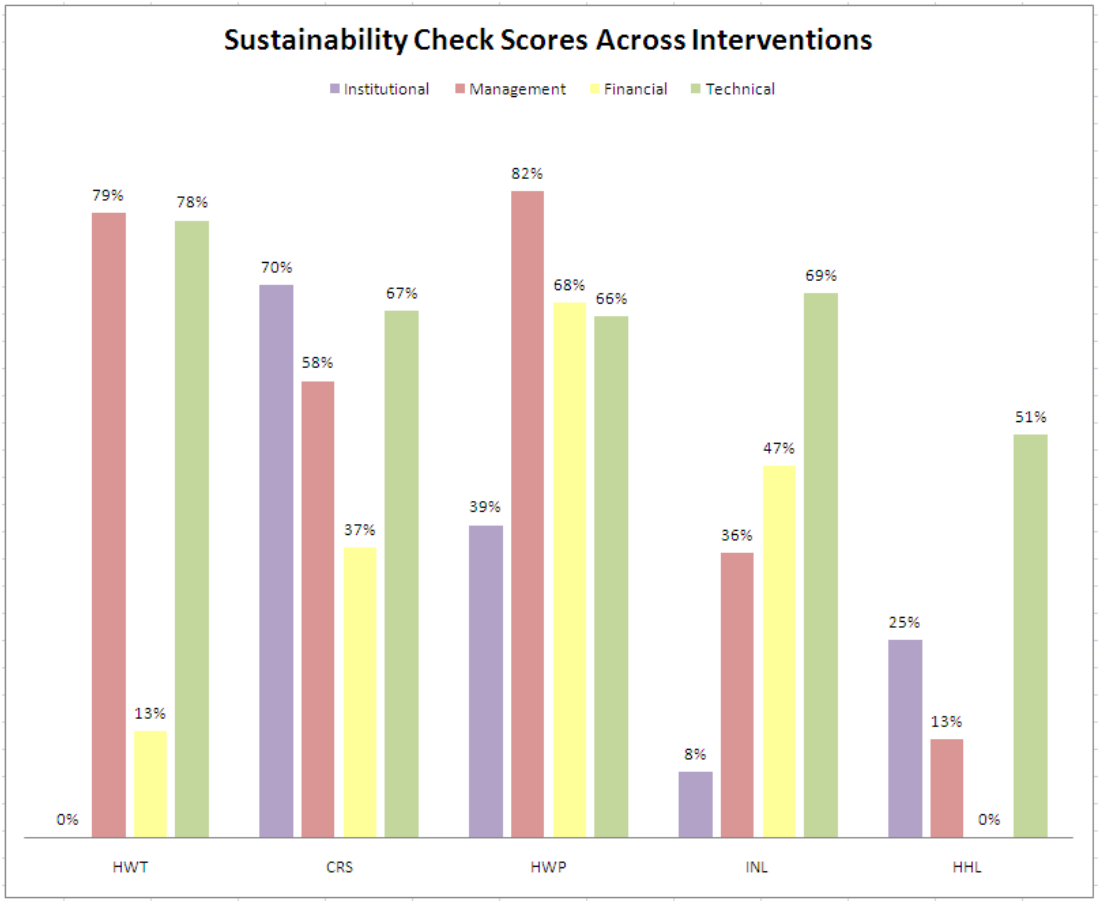


Figure 13: Overall factor Scores by Intervention

5.2 Primary risks to sustainability

Findings of the sustainability index analysis demonstrate a common trend in the WASH sector, that as you move outward from the community to the intermediate (district and province) and national level the scores decrease. The stakeholders outside the community are crucially connected to the sustainability of the interventions, however in many cases there is no presence or support available at the district level (e.g.-CRS) or national level (e.g.-HW) or both (e.g.-HHL). This trend is very visible in the graphs of the individual indicator scores by factor shown in **Annex 8**

The district level scores represent the first line of support to service providers such as community facilitators or water communities. At the national level these scores represent the enabling environment which are mechanism and instruments (e.g.-policies, funding mechanisms, legislation) which are necessary to form the basic building blocks for service authorities and service providers to fulfill their functions (Lockwood and Smits, 2012). In general the greatest risk to the sustainability of the interventions is that when water systems fail, latrines or septic tanks fill, or filters break-that there are not the systems in place outside of the community to ensure that spare/replacement parts exist and qualified technicians are available and funding mechanism and policies are in place to ensure continuity of WASH services. Below are a number of additional risks to sustainability. Although they are separated by intervention, it is important to be aware of areas that overlap.

Water Supply Interventions: Community Reticulated Systems (CRS)

Policy Reform- Decentralization efforts within INAPA have been slow and stalled with the recent BID/AECID pilot project. Although the pilot project is emphasizing institutional strengthening at the provincial level, it is unclear how this will affect the support provided to rural areas. Meanwhile, the operational budget of UEAR, the main monitoring and support mechanism for rural communities has been slashed, and personnel transferred.

Financial Support to District Service Authorities- With a very limited budget and low capacity (administrative, technical), district level stakeholders currently play an extremely limited role in the water supply sector. This is a missed opportunity and a serious threat to the sustainability of CRS in rural areas. National budgets ebb and flow and INAPA's focus changes from one region or province to another. Sector knowledge has shown that support from the local level (municipality or district) is often the most responsive and accountable.

Culture of Non-payment- In the Dominican Republic, water is considered a public good. Consumer price index for water (0.34) is significantly lower than that of electricity (3.88) or telephone (3.24) suggesting that water is significantly undervalued (Rodriguez, 2008). Approximately 90% of billed clients pay a fixed tariff regardless of usage and 72% of billed clients evade payment (Rodriguez, 2008). Currently all rural water systems are subsidized by INAPA, local government, or other agencies. In *bateys*, private sugar consortium[19]pay the electricity costs and/or provides water from systems it maintains. Although cross subsidies (i.e.-diverting profits from urban areas) may be necessary to provide water service in remote areas, it is clear that current services are highly undervalued.

Water Resource Plan-- INAPA admits that the efforts to monitor and control the use of hydraulic resources in the DR are inadequate. Under current law the Secretary of the Environment (MMARN) only charges a small fee (128 USD) for a permit to extract ground water. Consumption of up to 22,000 gallons per day is considered "self-consumption" and is not regulated. Threats to groundwater are significant and include: salt water intrusion, chemical and biological contamination, and over extraction. In the some of the communities visited, salt water intrusion due to excessive groundwater pumping is affecting the groundwater supply.

Sanitation Interventions: Household Latrines (HHL)

Unclear Roles and Responsibilities in Sanitation-Although INAPA is the service authority for sanitation, it really does not have a presence outside of urban areas. There are other national ministries that play a limited role in the sanitation sector (see Annex 1) however there is no clear institutional mandate for sanitation in rural areas- particularly with regard to oversight of latrines. At the district level, there are no HHL service authorities and the only actors are project related. In general, sanitation is not viewed as a service, and infrastructure is disposable- an ideology that is facilitated by a project implementation approach.

[19] Private sugar consortiums have replaced the State Sugar Council (CEA), these corporations are still informally referred to as *ingenios.*

Pit-emptying services - Building comfortable, robust and expensive permanent structures suggests a commitment to long-term sanitation. However, there are neither a culture of solids handling nor a current presence of formal or informal services for emptying latrines. Without a framework promoting pit-emptying and safe disposal there is a substantial risk that some users may revert to open defecation. In a previous study 11% of respondents in these communities practiced open defecation (Mercedes 2010).

Appropriate Technology Choice: Without an adequate plan for solids disposal and the requisite supply of services to safely manage the solids, the benefits of such robust latrines, compared to their sizable costs, is unclear. Individual latrine prices were listed as much as $878 in one community[20]. This is particularly concerning in the context of the evaluation where 25% (n=45) of households surveyed said they shared their latrine with 10 or more people.

Paternalism-A potential undesirable consequence of constructing relatively expensive infrastructure for an individual household without clearly outlining the long term costs and responsibilities for the user, is the view that the infrastructure maintenance costs remain with the implementing organization (USAID's partners). In the Sustainability Index all households (n=160) were unable to list the long-term costs of their latrines, and in general did not see an economic benefit to them. 95% of respondents admitted they were not saving for any potential cost in the future. In the context of a large scale "community make-over" project with numerous collectively/publically owned works (e.g.-community center, school, water system) it can be difficult for the user to fully take ownership of an individual intervention (e.g.-household latrines). The risk is that as soon as the latrine is unusable the user will revert back to previous practices: "going to the cane fields," building a crude latrine, etc. Unusable can mean that it has filled with fecal matter and/or water from improper drainage.

Photo 1: Decommissioned latrine next to a newly construct Alliance latrine.

[20] In a file provided by Rotary District 4060, MUDE had estimated costs for latrines in Paraiso, Victoria, and Batey 3 of $877 per latrine including "materials costs" and "labor costs and other."

Weak/Non-existent Environmental Regulations- Currently there is no law, policy, or guideline regulating the location of latrines. Ideally government policy would dictate appropriate location and crowding criteria to protect water supplies and public health. Neither the Ministry of Health nor the Ministry of the Environment has formally recognized or readily available criterion addressing latrines. The Ministry of Public Works and Communication (MOPC) has a requirement that each household must have one toilet and one hand washing facility suggesting that latrines shared between households may not meet this requirement. However, in a number of *bateys* shared latrines were knowingly installed.

Lack of construction standards and norms- MOPC maintains guidelines and specifications for construction works in the DR. However no guidelines exist for latrines. Numerous NGOs are working in the DR installing latrines using different design criteria. Both Alliance partners utilized their own design criteria and it is unclear whether either should function as a pit latrine or composting latrine, with significant sustainability issues in either case.[21] As previously mentioned there were significant problems with flooding of latrines. In Consuelito, 11 of 30 latrines were missing components, 9 households stated that their latrines fill with water when it rains and one's was filled with water at the time of survey. Similar problems also occurred in the *batey* Don Juan.

Photo 2: Improperly sited latrine which has flooded.

[21] In an interview with the MUDE architect that designed the latrines it was explained that households should add ash to the latrine as a desiccant. However, stickers placed on latrines did not instruct users to do so and ash was not found in any of the latrines. Furthermore in most *bateys* cooking is done with gas or, more commonly, over carbon which produces insufficient ash for use as a desiccant in ecosan latrines. Finally, numerous households admitted to bathing inside the latrines and stated that the hole fills. Some cited a "horrible odor" emanating from the latrine, but did not associate the two events.

Sanitation Interventions: Institutional Sanitation Facilities (INL)

Insufficient Enforcement of Norms - MOPC manages the norms for construction of water and sanitation facilities[22] in the DR, although the job of enforcing these standards is not clear. In general, each municipality should (in theory) have a department of urban planning. However most municipalities have inadequate budgets to pay personnel, and as a result there is no one to review plans and approve construction. Also, it is not clear who has primary authority in the case of schools which are constructed by the Ministry of Education. For the construction in *bateys,* USAID environmental regulations were utilized. However, at least one case arose where a borehole rehabilitated under the Alliance project, was located well within the 20 meter minimum distance from a septic tank or drainage field, the regulation specified in the MOPC guidelines. School officials insisted that the children don't drink the water at the hand-washing stations, none-the-less this poses a significant health threat.

Public Health Threat of Desludging- Unlike latrine solids removal there does exist (although in very isolated areas) informal septic tank pumping companies. However no licensure or permitting process currently exists for these "septic divers." Although there are 29 wastewater treatment plants in the country there are many more rivers and canyons and illegal dumping is common according to one knowledgeable source[23].

Hygiene Interventions: Household Water Treatment (HWT)

Community Facilitator/Health Promoter- In many of the stakeholder interviews, the CF's were identified as a key link to project success. In most cases these individuals are working as volunteers or receive very little remuneration compared with the responsibilities they are charged with. These individuals are often the drivers of sustainability of these interventions. WASH services can hinge on the activity level of these individuals and without the proper monitoring and support this can also be the primary risk to sustainability.

Formal Feedback and Systematic Monitoring/Follow up: Missing from this component was a formal feedback mechanism to ENTRENA (responsible for training the CF's) about the performance of the CF's which could have diminished both the sustainability of this intervention and the HWP intervention. In addition, despite the significant efforts of the one Rotary District employee and the other District Rotarians, the feedback provided to Rotary District 4060 by the CF and the community access partners is minimal, voluntary, and not systematic. Unlike the BSF implementation model, there appeared to be little if any organized training, follow-up, or support tailored for the CWF.

Subsidies- It is unclear what price was paid for the CWF in the initial distribution. BSF filters are distributed at a fraction of the actual cost. Households pay between $2 and $25 (average $10.87) for BSF, with 28 household receiving filters free of charge. BSF cost approximately $100 (including installation). In this study, the use of the BSF was found to correlate to price paid, which has been observed in various other studies of point of use treatment technologies (Walsh 200, Brown et al. 2009). In addition these studies found that continued use over the long term also correlated to purchase of the filter. Usage rates may decline significantly after project completion, (up to 2% per

[22] Septic tanks and drain fields.
[23] MUDE employee who was interviewed stated that they discharge in canyons and rivers.

month in one study-Brown et al, 2009) or the novelty of the new product wears off. This likely played an important role in the steep drop in usage of CWF.

Replacement parts-The ability to buy replacement parts in the survey responses of the BSF surveys refers to plastic tubing and hoses and all parts for CWF. None of the households visited said they knew where to obtain the filter receptacle, media, diffuser plate, or top for the BSF and only one person out of 29 said they could buy a replacement for their CWF. Although the plastic BSF are thought to be very durable, it is acknowledged that if moved the media (sand) can be compacted and therefore the filter will require reinstallation and could require additional sand. For ceramic filters, as discussed earlier, there was a significant issue with breakage and up-take of the technology.

Photo 3: Repurposed Filter

Market distortion- Currently concrete filters are being manufactured in Dajabon and at the Good Samaritan Hospital in La Romana[24] Distributing filters below the price charged by local artisans can artificially suppress their market value. The owner of the factory in Dajabon charges approximately $77 per filter if paid in cash up front, and $97 if paying in installments (up to 10 month period). Suggesting that households may be willing to pay more if the option is given to pay in installments. The Dajabon factory is subsidized by an NGO called Add Your Light. The owner of the factory estimates the actual market price to be approximately $128 per filter delivered, significantly higher than what was charged under the Alliance.

[24] From information collected on Rotary's *'WASRAG' (Water and Sanitation Rotarian Action Group)* blog it appears that both plastic and concrete filters are promoted by the hospital. We contacted the director of the hospital's Bio-Sand Filter Program, who is a Rotarian, however he did not provide any information.

Buy- in- A large portion of the population (51% overall and 33% in rural areas) drinks bottled water (*botellon*). *Botellon* water is relatively low cost (0.15 US per gallon), is of reliable quality, and is ubiquitously available. Although there are definite financial advantages to using HWT, if there is not critical buy in on the reliability of the technology, then *botellon* water remains an attractive alternative. Although a high percentage of households reported using filters at least once a week, Rotary material suggests that ideal use would be at every one to two days[25]. Support to promoters for monitoring and maintenance of HWT as well as access to HWT products, including replacement filters is crucial to ensuring continued buy in. Tied into this issue is the fact that purchasing inexpensive *botellon* water in small amounts maybe more conducive as opposed to large lump sum payments.

Hygiene Interventions: Hygiene/Hand washing Promotion HWP

Unclear Institutional Roles and Responsibilities- Like sanitation, the roles and responsibilities for hygiene and hand washing promotion amongst government institutions are nebulous and as a result there is overlap in many areas, with deficits in other areas. Clarifying the roles and responsibilities is an important step necessary to ensure that development partner activities are aligned with nationally-led policies, strategies, planning processes and priorities. This means the clarification of inter-institutional roles and responsibilities, as well as intra-institutional (i.e.-functions at different levels within the same ministry). The Sustainability Index found that there is little collaboration between local governments and the UNAP/DPS, who operate at the local level, and also that the relationship between individual UNAP/DPS with their colleagues at the national ministry (MISPAS) varied significantly.

Sector Finance- From the perspective of stakeholders at the district/provincial level, the national budget spent on hygiene is manifested as solid waste collection (performed by municipal governments) and education campaigns realized by MISPAS (e.g.-public service announcements surrounding specific public health concerns: dengue, cholera, influenza). Even though limited budgetary information was obtained during this evaluation, there is considerable anecdotal evidence suggesting that insufficient funds are available to local stakeholders to administer for hygiene promotion. The risk is that if local stakeholders do not have the requisite resources and administrative control, the HWP interventions may not be adequately customized or contextualized to meet needs of the target population.

Community Facilitator/Health Promoter Capacity- As discussed in the partnership assessment, there is limited actual hygiene promotion conducted by the community facilitators. The primary focus of their work is on filter installation and education on filter operation and filter hygiene. Both ENTRENA staff and District 4060 representatives admitted that the demands placed on some CFs for filter installation alone is significant, and therefore it may be unrealistic to expect these volunteers to effect behavior change amongst peers in their community. ENTRENA's training is comprehensive, however very condensed and intense- occurring over only two and half days. USAID, working with a larger budget and paid field personnel to provide support, may be justified in placing higher expectations on their health promoters (who are remunerated, albeit minimally). In addition, sometimes the individuals that attend the ENTRENA training sessions are actually members of a Rotary club or Community access partner, who are then responsible for training 1 or 2 CFs, who

[25] The Hydraid Manual states "that to function adequately, the filter should be used every one to two days."

subsequently train members of their community. There is a risk that as it descends the chain, the message could become diluted.

5.3 Triangulation of results

Out of 206 uniquely coded questions of the Sustainability Index Framework[26], 26 questions were triangulated by asking them at different levels. The majority of triangulated questions were for management (14) followed by technical (6), and institutional and financial (3 each). After aggregating household responses using the system described in section 4.1, the responses were analyzed for consistency. Out of 206 paired responses[27] 33% of the responses differed between the levels. The respondent at the lower level responded in the affirmative, while the upper level responded in the negative-for 61% of the conflicting answers. Of the total number of conflicting responses 64% were between the DL-NL verses only 9% that were between HH-DL.

5.4 Sustainability Index findings in context

In broad terms the findings of the Sustainability Index review reflect the sector reality of the Dominican Republic, as well as some of the more specific contextual issues relating to the programming areas of the Alliance, and in particular USAID's *Batey* Community Development Project. The main highlights of this contextualization are as follows:

i. The WASH sector is generally weak in rural areas and decentralized capacity is very low to provide long-term support, back-stopping or technical guidance. As a rule sustainability factors are found to become more challenging at higher levels, with a very small and resource-scarce rural unit at national level. INAPA's decentralized unit (UAER) in the east zone has limited presence and this is reflected in the low scores for the related management and institutional indicators relating to district level support.

   In some cases NGOs are providing 'parallel' services or functions, which are tending to substitute for low INAPA or local government capacity. Whilst this solves an immediate problem, it is inherently unsustainable in the long-term as NGO programming focus areas change and funding sources are uncertain, meaning that such support may disappear at relatively short notice.

ii. For interventions covered under the review in which sector responsibility comes under a different ministry the trend is partially reversed, as is seen in actions supported by the Ministry of Health (handwashing and hygiene promotion) or the provision of some resources and financing for institutional sanitation facilities (as oppose to household latrines) by the Ministry of Education and/or city councils.

iii. In the Dominican Republic sanitation is the last taboo. The sub-director of INAPA admitted that the sanitation projects that are executed [in the Dominican Republic] do not comply

[26] More than 206 questions were asked in the surveys, but only 206 questions were coded. The final response to many coded questions was determined by asking a series of sub-questions.

[27] Paired responses is the number of uniquely coded questions asked to at different levels for each intervention multiplied by the number of communities.

with the minimum requirements in terms of financial and technical viability and environmental sustainability. (Rodrigurez, 2008). There is no explicit regulation addressing latrines (construction, technology, sitting, maintenance, etc). Enforcement of all regulations governing the WASH sector is minimal and highly dependent on the capabilities of the district or municipal authority. These gaps and weaknesses are reflected in the overall very low scores for all factors in the household latrine intervention and almost as poor scores for most aspects of the institutional sanitation facilities program.

iv. Where Alliance activities were executed as part of the Batey Community Development Project, certain elements are seen to perform better where they have been able to benefit from this larger program (i.e. community water supply systems receive more support and follow-up training and benefited from the much broader USAID-funded health program). The Batey project is innovative and unique in addressing crucial development issues in perhaps one of the most challenging social, cultural, and economic contexts in the country. But context can also lead to negative outcomes as is seen in the under-mining of the local market for domestically produced filters.

Ultimately therefore, and unsurprisingly, these findings indicate that '*context matters*', but this does not necessarily mean it is easy to address structural gaps in the sector or historic institutional weaknesses easily.

5.5 Insights from partnership assessment

The H2O Alliance between USAID and Rotary international functioned more as a parallel but separate partnership rather than a collaborative effort toward shared objectives. As explained in the introduction and detailed in the associated Partnership Assessment, this is largely due to constraints from the start of the partnership and several other challenges, such as weak transitions after staff departures. As a result, the implementing partners rarely met and were not able to strengthen their efforts through the sharing of resources or knowledge. This dynamic most certainly had an impact on the level of improvement achieved by the project (see partnership report), and to some extent, the sustainability index results described in Section 4. This potential impact of the partnership dynamic on the sustainability assessment is described for each of the interventions.

USAID (implementing partners) and Rotary International's separate design and implementation approaches and general budgetary differences of the CRS interventions is likely responsible for the discrepancy in sustainability scores in these systems. USAID focused strictly on the CRS in the *bateys* and RI focused separately on CRS in Los Uveros[28] which had the lowest scores (with the exception of one of the Batays that failed to establish a committee).

With a larger budget and significant political power to leverage, the USAID communities (*bateys*) may enjoy greater attention from the public sector authorities compared to the Rotary-funded system constructed with the help of Peace Corps (Los Uveros). FUDECO and MUDE have a verbal agreement with INAPA under which INAPA will provide: a supervisor to form and train the water committee, materials (accounting ledger, payment archive) for each committee, and water quality

[28] Rotary also funded two small systems serving 65 and 110 people the town of La Descubierta and La Gotera respectively. These towns are located next door to Los Uveros and the design and construction management of all three systems was carried out by a Peace Corps Volunteer.

testing services for samples from each *batey.* INAPA also agreed to facilitate the process of incorporation of the water committee (i.e.-ASOCAR status). Although the details of the long-term follow-up support roles and responsibilities of INAPA and MUDE/FUDECO remain vague, the Rotary funded CRS remains separate from this, diminishing the opportunity for crucial institutional support. More information on the difference in sustainability between systems built by INAPA and the Peace Corps is available elsewhere (Schweitzer and Mihelcic 2012).

Similarly, USAID implementing partners FUDECO and MUDE developed separated design approaches for the household latrines, which in part prevented them from jointly considering the supply chain aspects of sanitation that impact sustainability (i.e. pit-emptying, transport, and disposal/treatment). For this reason, sustainability scores for this intervention were low. A robust supply chain depends on achieving an economy of scale from similarly designed latrines, yet this opportunity was missed. Absent collaboration may have also affected the technical and management scoring as there was ambiguity with both designs whether they should function as pit latrines or composting latrines. Institutional latrines scored somewhat better as there are specific design criteria for these. However, the low management scores for the institutional latrine intervention may also be related to limited collaboration on the linking of these interventions within institutional frameworks.

The HWT intervention was primarily a continuation of Rotary's independent Biosand filter training and distribution program, and the obstacles to collaboration here may be reflected in the weak institutional scores. Similar to the CRS systems RI did not work alongside USAID to link this intervention with existing institutional frameworks. Additionally, disagreement on technology type between the partners prevented collaboration for improving the sustainability of Rotary's intervention, (e.g. addressing concerns about international sourcing and costs).

The community facilitator program is credited with a large amount of success for the HWT intervention. However, lack of coordination prevented resources from being fully leveraged to support this component and the HWP intervention, thereby diminishing buy-in and optimal use. Specifically, the local implementing agencies (FUDECO and MUDE on the USAID side and ENTRENA on the RI side) could have jointly developed more robust training and support to community facilitators[29] and promotional programs to increase filter demand and avoid the sustainability risk of the top-down approach. The HWP scored higher in management and institutional in the USAID *bateys,* likely because this was embedded in a larger health promotion program and there was more on-going support to facilitators through the district. Community facilitators trained through ENTRENA (the Rotary contactor) to support filter implementation and use as well as personal hygiene were not as thoroughly trained in personal hygiene and did not receive follow-up support from ENTRENA or from district-level health offices.

[29] Although ENTRENA technically had an employee (dual role with Rotary) that provided support, this was support targeted BSF and not HWP. It is noted that she was not operating officially on behalf of ENTRENA in her support capacity.

6. Recommendations to the Alliance in DR to improve future WASH programming

6.1 Recommendations for Alliance implementation activities

Water Supply Interventions: CRS

Engage District Stakeholders- Currently district stakeholders are bypassed in the water sector, particularly with regard to rural areas. Individuals in the local government can be viewed as a resource as they often are very knowledgeable about the local infrastructure, have a vested interested in the functioning of systems, and in general can be more responsive and easier to hold accountable than their counterparts at the provincial or national level. Therefore, capacity building of these individuals and institutions is crucial to ensuring that WASH services will be sustainable in the future.

Replicate Islands of Success- There are islands of success with regard to capacity building of local stakeholders in the monitoring and support of CRS. In the municipality of Altamira in the Province of Puerto Plata, Peace Corps and local NGOs have been working with the city council and the mayor to create an association of water committees from the area. These water committees meet frequently to discuss problems, arbitrate disputes, share lessons learned, and provide assistance (labor, equipment, or technical advice). The water committees of the Rotary funded CRSs (Los Uveros, La Descubierta, La Gotera) will become members of this association and hopefully this would improve sustainability scores for these communities in future evaluations. In the future the Alliance could try to recreate these islands of success.

Utilize Monitoring and Evaluation Technologies- Recently tools have been developed to facilitate the collection, storage, and analysis of field data using handheld smart phones. Many different platforms exist. A great advantage of the technology is that it can enable non-experts to gather data and to train them in enumerating a study. Numerous different companies offer their services in training and developing customized platforms, however there are currently WASH specific platforms that exist (FLOW, Water Point Mapper, etc). Also there are open-source resources[30] that can be utilized and may provide greater flexibility.

Sanitation Interventions: INL and HHL

Advocate for Policy – As demonstrated there is significant weakness regarding the sanitation policy. In an effort to move away from a 'project based' approach which is the *modus operandi* in the sanitation sector it is necessary to engage with national level players. Until the enabling environment is improved, households will continue with the same sanitation practice described earlier. By acting in a planning and implementation capacity there is an important opportunity foregone for Alliance partners to influence sector policy

[30] http://www.kobotoolbox.org/

Hygiene Interventions: HWT and HWP

Social Marketing Framework- There is a significant potential to engage stakeholders in the Dominican Republic or abroad with experience in social marketing and demand creation. In order to address the long term financial sustainability issues of many interventions it is important to clearly understand the profile of willingness and ability to pay in the communities targeted by interventions. Currently the model used for HWT is a supply-driven model. Through a market assessment and social marketing framework users could be engaged and demand created so that users would cover a larger cost of the interventions. In addition, similar market assessments could be conducted to determine what reasonable contributions would be for other interventions (e.g.-access to CRS, HHL)

Microcredit- Filters are promoted by citing the high cost of bottled water. An example of savings used is 2 *botellons* per week over one year costs a family $80. However, an important distinction by the Alliance partners is not made or at least not articulated -these costs are small recurring costs. Therefore, although the financial savings of a filter maybe significant, it may not be reasonable to expect households to be willing or able to invest via a lump-sum payment. In many rural areas the obstacles to savings mechanism through formal fiduciary services are significant. However, alternatives are in place. The manufacturer of concrete BSFs in Dajabon sells approximately 30-40 filters per month. Many of his transactions are with individuals of limited economic means who pay through a payment plan over 10 months. These individuals are charged 97 USD via payment plan verses 77 USD when paying in cash up front. Although MUDE lists micro finance projects in their company profile[31] a MUDE employ insisted that residents of the *bateys* could not afford to pay more than 50RD ($1.28) for the filters. It is important to note that microcredit and microfinance[32] are different; however as shown in Dajabon, there is no such universal inability to pay and therefore it is unlikely the case in the *bateys*. In the future Alliance activities should exploit the microcredit experience of the partners and seek further assistance where necessary.

Meaningful Integration of Hygiene Promotion: Ideally, to ensure that the impacts from other WASH interventions are maximized, hygiene promotion would be included in a packaged intervention. However, the evaluation showed that often times, hygiene isn't given adequate emphasis and resources. It may be unrealistic to expect a CF facilitator with one weekend's worth of training to effect behavior change amongst a population of their peers with limited time andresources.

Leverage Social Capital - As mentioned in the partnership assessment, there are key strengths of each partner that can be leveraged for a synergistic result. USAID and its implementing partners have more experience in hygiene education and Rotary has an extensive network of community contacts through Rotary Clubs and the Community Corps. These strengths should be exploited to the greatest extent possible.

7.2 Recommendations for Alliance monitoring frameworks

[31] MUDE's website http://www.mude.org.do/microcapital states that in 2010 it issued 2,346 loans under $400 for a total of over $450,000 USD. Loans are directed at women and are used for income generating activities.
[32] Microcredit is a broad category of financial services (savings, loans, insurance, money transfer services, etc) to small businesses and entrepreneurs while microcredit (a category of microfinance) is the provision of credit services to poor clients.

The first Sustainability Index review of Alliance interventions in the Dominican Republic has highlighted a number of critical areas and has provided a testing ground for this type of composite framework looking at different factors across different levels of intervention. Much has been learnt about the way such a tool can work and what its limitations are (see section 8). One of the areas to explore further is to what extent can the current members of the Alliance, USAID-DR and the national Rotary District 4060, and their respective implementing partners, can build on these experiences to improve what they are monitoring as part of their everyday work.

Based on the review, and at the same time trying to be realistic about what is possible and cost-effective to measure on a regular basis, a number of the most important potential data for long-term monitoring can be identified; these are:

Water:

WT-CRS-I-SP1 There is a water committee which has been constituted in line with national norms and standards

WT-CRS-I-D1 Roles, responsibilities of district (service authority) and ownership arrangements clearly defined

WT-CRS-M-SP1 Representative water committee actively manages water system with clearly defined roles and responsibilities

WT-CRS-M-D1 There is regular monitoring of water services and community management service provider and follow-up support

WT-CRS-F-D2 National/local mechanisms to meet full life cycle costs, beyond community contributions and tariffs

WT-CRS-F-SP1 Tariff setting complies with national/local regulations, including social tariff

WT-CRS-F-D1 Resources available for district/service authority to fulfill functions

WT-CHP-T-D1 The district water staff are able to provide support for maintenance and repairs on request

WT-CRS-T-N1 National/local norms defines equipment standardization and arrangements for providing spare parts

WT-CRS-T-SP1 Standpipes/household connections are functional and providing basic level of service according to national policy

Sanitation:

HHL-

SN-HHL-I-D2 There are licensed and regulated septage haulers/desludgers

SN-HHL-M-SP1 Pit emptying services are accessible to households and households clearly understand their responsibility for pit emptying.

SN-INL-M-D1 Monitoring of latrine use and maintenance and follow-up support provided by district/supporting institution

SN-SHL-F-SP1 household ability (willingness) to meet long-term operational and capital maintenance expenditure

SN-HHL-T-SP3 Latrines are used and valued by all

SN-SHL-T-D1 Goods and services for maintenance, repair and emptying of household latrines available at district level

SN-HHL-T-SP1 Latrines constructed in-line with design criteria needed for long-term and safe use.

INS

SN-INL-M-SP1 School/institution understands responsibilities for pit/septic emptying and has capacity to manage this

SN-INL-M-D2 Support to schools/institutions in upkeep of facilities is available as needed

SN-INL-T-SP2 Latrines are readily usable by students/Users in terms of distance from institution and number of people sharing them

SN-INT-F-N1 National/district mechanisms to meet full life cycle costs, beyond school / institution's budget

Hygiene:

HWT:

HY-HWT-F-D1 HWT products, including replacement filters available in local markets and are affordable

HY-HWT-T-SP1 Regular use and overall acceptability

HY-HWT-M-D1 Support to promoters for monitoring use and maintenance of HWT provided, including refresher training

HWP

HY-HWP-I-D1 Coordination and support for hygiene promotion by district authority and other agencies

HY-HWP-M-D1 Monitoring and follow up support provided to community hygiene promoter/facilitator, including refresher training

8. Lessons learnt about the Execution of the Sustainability Index Tool

As is discussed in detail in the partnership evaluation, the activities of the Alliance partners have largely been executed independently, meaning that USAID and Rotary have independently implemented certain interventions, sometimes without proper coordination. As a result, at the outset of this evaluation there was confusion as to what activities even constituted the Alliance. Initially USAID and its implementing partners understood that the Alliance only included the components of the Batey Community Development Project that also included Rotary Funds. This resulted in a number challenges that will be discussed in further detail below.

One significant challenge faced in the field was the lack of clear, detailed, and disaggregated intervention data. For HWT interventions there was data regarding aggregate number of filters distributed to each community facilitator or access partner. However, until the field visits, it was much less clear how those filters had been divided between the communities (*parajes/barrios*) in which the facilitator or access partner organization worked. In some cases up to 40% of the total filters distributed to the community had yet to be installed. In general, this reflects the insufficient communication and reporting between communities and the Rotary District 4060. For the other interventions (CRS, HHL, INL, HWP), details provided were very vague (i.e. what components were included in hygiene promotion, what the specific design of latrines, number of shared vs. private household latrines, number of rehabilitated vs. newly constructed water systems, etc.). Without detailed information on the interventions, the contextualization of the Sustainability Index Tool and associated framework was challenging.

In each country the framework questions had to be contextualized, and in the Dominican Republic two types of contextualization were necessary. The first was the adaptation of the framework to ensure that questions reflected reality in the field (e.g. the actual training information provided to the beneficiaries during filter installation verses planned training). This adaptation was difficult due to insufficient understanding of scope and details of each intervention and implementation model. During the document review and landscaping of the evaluation the implementing partners had different perceptions as to what the Alliance included.

The second type of contextualization was cultural adaptation of the survey questions, which was accomplished through pilot testing of the data collection tools. Afterwards, considerable discussion within the field team (country coordinator, field team manager, and enumerators) took place to reach a consensus on wording, structure, and order of questions. Due to time constraints and the dearth of information during the planning and logistics phase, full scale pilot testing was only possible for HWT and HWP data collection tools. Based upon the information gleaned from pilot testing of these questions, modifications were made to the CRS and HHL household surveys.

Key lesson 1: piloting
Ideally the data collection tools for each intervention would be pilot tested in a community outside the sample frame and prior to initiation of final data collection. Given the limited education levels of many respondents, particularly in rural areas, contextualization is extremely important. This ensures the highest level of comprehension possible and ensures quality data.

Key lesson 2: sequencing of levels of enquiry

The ideal sequencing of surveys begin at the national level and continuing downward: district level, service provider and household. The evaluation occurred simultaneously at the district, service provider, and household levels. The investigation at the national level occurred as the other investigations were reaching their end. This was a result of the timing of the partnership evaluation and other logistic factors. The initial understanding of the Alliance was derived from the bottom-up. Had it been from the top-down, beginning with a more thorough understanding of all partner and WASH stakeholder activities, the contextualization challenges would have been minimized. This would have facilitated in the planning and logistics phase. For example, if there was a clearer understanding of Save/MUDE's latrine program and the lack of national regulations regarding latrines, it would have been possible to revise the household surveys and therefore increase the level of comprehension of the respondent.

Key lesson 3: phrasing of questions

The questions in the Sustainability Index Tool framework were structure to be easily coded (yes/no), however, qualitative data were also useful to ensure that responses were being uniformly interpreted. Although the survey was designed to produce yes/no answers, most responses given by the respondent were not strictly yes or no, especially where more than one question was asked to produce a single one yes/no answer. As a result, the enumerators were responsible for interpreting the answer of the respondent. Given that this is the first time the surveys have been implemented, it was not possible to accurately predict the range of answers and therefore the review relied heavily on the comments and observations of the enumerators to create a uniform interpretation of yes/no answers. In the future it may be beneficial to individually analyze each question and weight the benefits of field coding verses coding during data analysis (*post* facto). Benefits of field coding are easy of data entry and analysis, while *post facto* coding would mean that the data collected in the field could be more detailed. As with contextualization, sufficient time should be dedicated to discussion/determination of how responses should be interpreted and coded. This is important information to be considered when selecting and training enumerators and planning/budging for data entry, cleaning, and analysis.

Key lesson 4: data entry and cleaning

Since this was a pilot evaluation, data entry and cleaning was time consuming and challenging. It would have been more convenient if the methodology for analysis was established at the outset. This would have allowed the more straightforward data to be entered during field work by focusing on yes/no responses. It became apparent during preliminary analysis that the format required modification and more qualitative information needed to be included. The enumerator comments were crucial to understanding the context while analyzing the data, given that for this pilot evaluation, the majority of responses were field coded by the enumerators. After the pilot test there was a feedback session and the surveys were modified in order to standardize the field coding, however in the end the enumerator interpretation of responses created the range of yes vs. no answers. With sufficient iterations of the surveys and response coding the data entry, cleaning, and analysis will be much simplified.

References

Andujar, H (2012). INAPA-UEAR director. Personal Communication

Brown, J., Proum, S., and Sobsey, M D. (2009). Sustained use of a household-scale water filtration device in rural Cambodia. *Journal of Water and Health,* 7(3), 404-412.

ENDESA (2007). Encuesta Demografica de Salud. Dominican Health Health and Demographic Survey. National Statistics Office. Santo Domingo, República Dominicana.

Hayes, R.J. and Bennett, J. (1999). Simple sample size calculation for cluster-randomized trials. *International Journal of Epidemeology*. 28(1), 319-326.

Koestler, L., Koestler, A.G., Koestler, M.A., & Koestler, V.J. (2010). Improving sustainability using incentives for operation and maintenance: The concept of water-person-years. *Waterlines.* 29(2).

Lockwood, H. (2002). "A Strategy for Operation and Maintenance of Rural Water Supplies, Dominican Republic." *Waterlines*, 21(2), 22-24.

PNUD. (2008). Informe Nacional Desarrollo Humano 2008, Programa de las Naciones Unidas para el Desarrollo. Santo Domingo, República Dominicana.

ONE. (2008) República Dominicana: División Territorial de la Provincia Santo Domingo, 2008. Oficina Nacional de Estadisticas, Santo Domingo, República Dominicana.

Reyes Echavarria, E. (2012). "El Rol de las Empresas Prestadoras de Servicios de Saneamiento en la Incorporación de la Higiene dentro de la Política Pública de Agua y Saneamiento en República Dominicana." Conference presentation January 18, 2012. Santo Domingo, Dominican Republic.

Rodriguez, M. (2008). "INAPA Profile 2008" PowerPoint presentation April 24, 2008.

Sara, J. and Katz, T. (1997). Making Rural Water Supply Sustainable: Report on the Impact of Project Rules. Water and Sanitation Program, Washington, D.C.

Schoberg , D. (2009). Water and Wellness. *The Rotarian.* August 2009. Available at http://www.rotary.org/en/MediaAndNews/TheRotarian/Pages/BioSand0908.aspx

Schweitzer, R.W. and Mihelcic, J.R. (2012). Assessing the Sustainability of Community Management of Rural Water Supply in the Developing World. *Journal of WASH for Development.* 2(1)

Stauber, C. (2010). Rotary/USAID Alliance: Monitoring and Evaluation Plan for Allianza Agua Segura para los Niños Safe Water for the Children. United States Agency for International Development (USAID), Washington, D.C.

Tynan, N. and Kingdom, B. (2002). A water scorecard: Setting performance targets for water utilities. Water and Sanitation Unit. The World Bank, Washington, D.C.

UNICEF. (2008). Progress in Drinking-water and Sanitation: special focus on sanitation. United Nations Children's Fund. Available at http://www.wssinfo.org/en/40_MDG2008.html.

Walsh, M (2000). A Household Survey of the Ceramic Water Filter in Nicaragua. Unpublished Report.

World Bank (2012). World Development Indicators 2012. World Bank, Washington, D.C.

WHO/PAHO (2007). Estrategia de cooperacion con el pais 2007-2011. Organización Panamericana de la Salud Organización Mundial de la Salud OPS/OMS World Health Organization. Geneva, Switzerland.

WHO/UNICEF (2010). Progress on Sanitation and Drinking Water 2010 Update. WHO Press, Geneva, Switzerland.

Annexes

Annex 1. Dominican government agencies involved in the WASH Sector

Ministry or Governmental Entity	Spanish Acronym	Role in the WASH Sector
National Institute of Hydraulic Resources	INDRHI	**Law 06/65:** Responsible for all water resources and infrastructure for productive uses (agriculture, hydroelectric, etc).
Ministry of Public Health: • Direction of Environmental Health (Department of Water, Department of Basic Sanitation) • Direction of General Health Promotion	MSP DIGESA DIGPRES	**Law 42/2001:** **Regulation 528-01:** Regulates water bottling, food, and beverage industry. Conducts personal and home hygiene promotion and hand washing campaigns along with other health education initiatives
Ministry of Public Works and Communication	MOPC	Manages design and construction guidelines for water and sanitation facilities[33]
Ministry of the Economy, Planning, and Development[34]	MEPyD	General regulatory and supervisory mandate
Ministry of the Environment	MMARN	**Law 64/2000:** Responsible for environmental permitting and impact studies. Regulates all commercial water use or in any situation where use >22,000 gal/day. Also controls discharge of residual water.
Federal Service Commission	n/a	**Law 841/35:** Regulates all public services
Direction of Norms and Standards	DIGENOR	**Law 602/77:** Develops and maintains standards and norms for quality control of water.
Comptroller General of the Republic	n/a	**Law 3894/54:** Controls federal resources and compliance with financial regulations.
General Accounting Office	n/a	**Law 130/42:** Supervises and audits the use of all government resources
Municipalities	n/a	Formulate local norms and standards through the office of planning and urban development.

[33] No regulations exist that address latrine design, construction, or siting.

Annex 2. Protocol for Establishing Sampling Frame and Selecting Households.

Step	Activity	Output
1	Document review	Documents and known data gaps
2	Procure missing information	Required information
3	Inventory communities*	Inventory of communities with community names, locations, number and type of interventions, beneficiaries, etc
4	Aggregate community data	Aggregate of total users for each Intervention Type
5	Verify primary unit of analysis at the Service Provision Level	Primary unit of analysis (e.g.-service provider, community facilitator, household) for each Intervention Type.
6	Identify Statistical Parameters	Statistical inputs
7	Calculated minimum household sample size	Minimum sample size (e.g.-minimum number of household surveys in total for each Intervention Type where the primary unit of analysis is the household)
8	Create spatial map	Map of communities
9	Analyze map and stratify communities	List of stratified communities
10	Identify sample frame	**Sample Frame:** List and location of communities.
11	Determine target household sample size based on best practice	Target household sample size
12	Sample size check (verify that target sample size is greater than minimum sample size)	Final sample size per community
13	Visit communities and select sample via systematic random sampling	**Sample:** List and/or location of household
14	Collect data	Household surveys, Interview records, Focus group transcripts, etc.

Sample Frame Identification using Stratified Sampling
Household selection/sampling

*-Although generically referred to as "communities," in urban areas the administrative unit used to identify the sample frame could be a neighborhood.

Multistage sampling approaches have the ability to provide detailed insights and holistic understanding obtained from qualitative research with the ability to generalize to a wider population offered by quantitative data collection (Rauniyar, 2009). It is important to note that the Sustainability Index is not an impact assessment, but rather a holistic assessment comparing data collected from numerous sources at the national, district, and service provider levels. Statistical significance was achieved for interventions where the primary unit of analysis at the service provision level is verified to be the household.. For these cases, the total estimated population served by the intervention (e.g.- HHL, HWP, or HWT) was plugged in to Equation 1 below, calculating the minimum number of household surveys that will be obtained during the assessment..

$$\textbf{Eqn 1}: \qquad n = \frac{\left[\frac{P(1-P)}{\left[\frac{E^2}{Z^2}\right] + \left[\frac{P(1-P)}{N}\right]}\right]}{RR}$$

n= minimum household sample size
N=Population for given Intervention Type
Z = Value for a given confidence level* (1.6499 for 90%)
E=Desired Margin of Error (decimal)*
P=Estimated population variance (decimal)†
RR=Estimated Response Rate (decimal)‡

*Terms of reference stipulate 90% confidence interval and 7% margin of error.
† Population distribution is assumed normal, P =0.5.
‡ An accepted value of 0.9 is used.

Once the minimum household sample size is determined, a spatial map is created and stratification is done of the communities to maximize heterogeneity between stratum.. A sample frame is determined by selecting communities within each stratum (Step 10).[35] After the list of communities (i.e.-sample frame) is obtained the target household sample size is determined based upon the assumption of conducting 15 household surveys in rural communities and 25 household surveys in urban communities (Step 11). The target sample size is compared to the minimum sample size and increased if necessary (Step 12). Finally, once data collection begins in the community, households will be identified randomly by surveying every nth[36] household. The sampling protocols for each country are described in more detail in the following sections.

[35] Ideally this selection process is random, with each community within a stratum having equal probability of being selected.
[36] To determine n, divide the total number of households in a community by the target sample size for that community. Beginning with a random house, every nth house is surveyed until the target sample size is reached.

Annex 3.Household Surveys (English example, see file for Spanish)

Date:

Enumerator Name:
Community:

Name of Respondent: **# of Household Members:**
Gender: **Age:**

QuestionNo.	Question	Answer
WT-CRS-I-SP1	**There is a water committee which has been constituted in line with national norms and standards**	
WT-CRS-I-SP1d	d) Has the junta directiva been democratically elected under the guidelines of the statutes? *(If in a Asamblea General (50% plus 1 to establish quorum) vote the Junta Directiva = Yes)*	Yes/No
WT-CRS-M-SP1	**Representative water committee actively manages water system with clearly defined roles and responsibilities**	
WT-CRS-M-SP1b	b) Does the water committee carry out all the roles required of it?	No/Some/All
WT-CRS-M-SP2	**Water committee members actively participate in Committee meetings and decision making process and reporting is transparent**	
WT-CRS-M-SP2d	d) Are technical, administrative and financial records kept and shared with the community on regular basis?	Yes/No
WT-CRS-F-SP3	**The water committee demonstrates effective financial management and accounting**	
WT-CRS-F-SP3c	c) How often does the committee share financial records with the community?	Circle ONE: Every 1/3/6/12 months Other:___months don't know Never
WT-CRS-T-SP1	**Standpipes/ household connections (depending on system) are functional and providing basic level of service according to national policy**	
WT-CRS-T-SP1b	b) Does the standpipe/household connection meet the criteria on reliability, accessibility (for standpipes) and quality? *(Reliability = Water available at some point every day)*	Yes/No
WT-CRS-T-SP1c	c) Does the standpipe/household connection meet the criteria on quantity?	Yes/No
WT-CRS-T-SP2	**The knowledge and spare parts are available to conduct maintenance and repairs in a timely manner**	
WT-CRS-T-SP2d	d) How long did it take to repair the last breakdown of the system?	

SHARED HOUSEHOLD LATRINES

SN-SHL-I-D1	**Support for maintenance and proper use of latrine in coordination with health ministry**	**Answer**
SN-SHL-I-D1d	d) Has there been follow-up by support institutions after the completion of the latrine?	Yes/No
SN-SHL-M-SP1	**Pit emptying services are accessible to households and households clearly understand their responsibility for pit emptying.**	**Answer**
SN-SHL-M-SP1a	a) Is a pit emptying service available?	Yes/No
SN-SHL-M-SP1b	b)Do you know when the pit needs emptying? Do you empty the pit when needed? *(Yes = Affirmative answers to both)*	Yes/No
SN-SHL-M-SP1c	c) If shared latrine, do you agree with the shared responsibility for managing pit emptying? *(If private latrine, skip to question d)*	Yes/No
SN-SHL-M-SP1d	d) How much does it cost to empty the pit? *(compare to known average monthly income: Yes if less than X% of monthly income, No if more than X% of monthly income)*	Yes/No
SN-SHL-M-D1	**District/local sanitation support staff carry out regular monitoring of latrine use and reactive planning/interventions**	**Answer**
SN-SHL-M-D1b	b) Is monitoring carried out at least once every 6 months (or as specified)?	Yes/No
SN-SHL-M-D1c	c) Is there continued promotion of latrine use?	Yes/No
SN-SHL-F-SP1	Household ability to meet long-term operational and capital maintenance expenditure	**Answer**
SN-SHL-F-SP1a	a) What are the long term operational and capital maintenance costs of their latrine?	Yes/No
SN-SHL-F-SP1b	b) Operational and long-term capital maintenance costs are less than X% of annual household income for X% of the households. *(Yes if less than 3% of monthly income, No if more than 3% of monthly income)*	Yes/No
SN-SHL-F-SP1c	c) Are you saving to pay for long term capital maintenance costs?	Yes/No
SN-SHL-F-SP1d	d) Are their programmes to support low-income households with the financial costs of maintaining their latrine?	Yes/No
SN-SHL-T-SP1	**Latrines constructed in-line with design criteria needed for long-term and safe use.**	**Answer**
SN-SHL-T-SP1a	a) Have the latrines been constructed with all the appropriate components (e.g. slab with cover, vent)? *(check: If yes skip to question c) if No go to question b)*	Yes/No
SN-SHL-T-SP1b	b) How have costs prevented the appropriate construction? Will continued improvements be made to the latrine? *(Yes = Affirmative answers to both)*	Yes/No
SN-SHL-T-SP1c	c) Do latrines have handwashing facilities with soap or other cleaning agent available? *(check)*	Yes/No
SN-SHL-T-SP1c	d) Are the latrines suitable for children (e.g. child-sized slabs/holes) ? *(check)*	Yes/No
SN-SHL-T-Spe	e) Are the latrines located within 30m of a water source AND where there is little or no risk of flooding?	Yes/No
SN-SHL-T-SP2	**Latrines are readily usable by all households in terms of distance form household and number of people sharing them**	**Answer**

SN-SHL-T-SP2a	a) Are there national/local norms for siting and capacity (crowding) of shared household latrines?	Yes/No
SN-SHL-T-SP2b	b) Do the latrines comply with crowding criteria (i.e. no more than x people sharing latrines)?	Yes/No
SN-SHL-T-SP2c	c) Do the latrines comply with siting criteria (i.e. no further away than X meters from households)?	Yes/No
SN-SHL-T-SP3	**Latrines are used and valued by all**	**Answer**
SN-SHL-T-SP3a	a) Do all people in the household(s) use the latrine 100% of the time?	☐ None ☐ Some ☐ All
SN-SHL-T-SP3b	b) Households understand the health benefits of latrines?	Yes/No
SN-SHL-T-SP3c	c) Households understand the associated economic benefits of latrines?	Yes/No
SN-SHL-T-SP4	**Latrines are well-maintained**	**Answer**
SN-SHL-T-SP3a	a) If shared, Is there a regular cleaning program or someone among households who is responsible for cleaning the shared latrine? *(If private skip to next indicator)*	Yes/No
SN-SHL-T-SP3b	b) Does the cleaning program include replenishment of soap and anal cleansing materials?	☐ None ☐ only soap ☐ yes to all
SN-SHL-T-D1	**Goods and services for maintenance, repair and emptying of household latrines available at district level**	**Answer**
SN-SHL-T-D1a	a) Is equipment for repairs for latrines are available at district level?	Yes/No
SN-SHL-T-D1b	b) Are there private sector operators involved in providing support to sanitaion services?	Yes/No

Handwashing Promotion

HY-HWP-M-SP1	**Community facilitator or promoter with capacity to monitor and provide follow-up support to households , including refresher training**	**Answer**
HY-HWP-M-SP1a	a) Are there community facilitators or hygiene promoters? *(If No skip to next indicator)*	Yes/No
HY-HWP-M-SP1c	c) Do the community facilitators/ promoters provide support to households following monitoring of hygiene practices as needed?	Yes/No
HY-HWP-M-SP1d	d) Do the community facilitators/ promoters provide refresher training to households about good hygiene practices?	Yes/No
HY-HWP-F-SP1	**Willingness and ability to pay for hygiene products, including soap**	**Answer**
HY-HWP-F-SP1a	a) Do you buy soap and how often?	Yes/No ____times/month
HY-HWP-F-SP1b	b) Does the household currently have soap or other cleansing agent available (e.g. ash)? (*check)*	Yes/No
HY-HWP-F-D1	**Soap and other hygiene products available in the community**	**Answer**
HY-HWP-F-D1a	a) Is soap available in the community?	Yes/No
HY-HWP-F-D1b	b) Can you purchase sanitary napkins in the community?	Yes/No
HY-HWP-F-D1c	c) Do you dry your dishes on a rack?	Yes/No
HY-HWP-F-D1d	d) Can you buy other hygiene products in the community (detergent, toothpaste, shampoo, chlorine).	Yes/No
HY-HWP-T-SP1	**Knowledge of handwashing and correct use of facilities by**	**Answer**

	households	
HY-HWP-T-SP1a	a) Can you please show me the proper way to wash your hands?	Yes/No
HY-HWP-T-SP1b	b) When should you wash your hands? ☐ *before/after food preparation* ☐ *before eating* ☐ *after going to the bath room or handling diapers*	Check Boxes

Household Water Treatment

HY-HWT-M-SP2	**Community facilitator or promoter with capacity to monitor and provide regular follow-up support to households in HWT, including refresher training**	**Answer**
HY-HWT-M-SP2a	a) Are there community facilitators or promoters?	Yes/No
HY-HWT-M-SP2b	b)Have community facilitators conducted follow up visits to households after filter installation? (YES= *At least two visits)*	Yes/No
HY-HWT-M-SP2c	c) Do the community facilitators/ promoters provide support to households following monitoring of HWT practices?	Yes/No
HY-HWT-M-SP2d	d) Do the community facilitators/ promoters provide refresher training to households about HWT?	Yes/No
HY-HWT-F-D1	**HWT products, including replacement filters available in local markets and are affordable**	**Answer**
HY-HWT-F-D1a	a) Are HWT products, including replacement filters, available in the local market?	Yes/No
HY-HWT-F-D1b	b) How much would you pay for a replacement filter? *YES if price they offer is greater than actual prices of filters (_____)*	Yes/No
HY-HWT-F-D1c	c) How much did you pay for the filter?	_____Amount ☐ Paid Full ☐ Paid Part ☐ Paid None
HY-HWT-F-D1d	d) If your filter stopped working, how could you get replacement? ☐ knew program or filter manufacturor (YES), ☐ didn't know, said they would ask Rotary/USAID (NO)	Check box
HY-HWT-T-SP1	**Knowledge of correct use of HWT**	**Answer**
HY-HWT-T-SP1a	a) Does household know proper use of filter. *Check for each observed* ☐ *diffuser plate in place when water added,* ☐ *spout is unobstructed and clean,* ☐ *lid is replaced after filling,*	YES (all done correctly)/NO
HY-HWT-T-SP1b	*b)* Do you clean your filter? (IF YES) When? *Check if done at regular intervals:* ☐ *external components are cleaned regularly* ☐ *bio layer is gently cleaned when flow decreases*	Yes (if ll done correctly at regular intervals)/No
HY-HWT-T-SP1c	c) Can household explain how to properly clean filter? *Family member can adequately demostrate or describe process of cleaning filter.*	Yes/No
HY-HWT-T-SP2	**Households practice safe water storage**	**Answer**
HY-HWT-T-SP2a	a) As interviewee explains practices, observe/listen for the following: 1) separate container used to collect filtered water	Yes/No

	2) container is clean 3) container is covered or small mouthed	
HY-HWT-T-SP2b	b) Household understand how to treat filtered water with chlorine and show the chlorine eye dropper? *1 drop of chlorine per gallon of water, stir and wait 3 minutes before consuming.*	Yes/No
HY-HWT-T-SP3	**Regular use and overall acceptability (time, taste etc.)**	**Answer**
HY-HWT-T-SP3a	a) How often do you add water to your filter?	Yes/No
HY-HWT-T-SP3b	c) How often do you use filtered water for purposes other than drinking? *(Yes = at least once a week)*	Yes/No
HY-HWT-T-SP3c	c) Do you like the taste of the filtered water?	Yes/No
HY-HWT-T-SP3d	d) Are households overall satisfied with the filter?	Yes/No
HY-HWT-T-SP4	**Community or technician able to provide maintenance and repairs, including access to spares**	**Answer**
HY-HWT-T-SP4a	a) Are households or local technicians able to carry out repairs?	Yes/No
HY-HWT-T-SP4b	b) Is technician able to reinstall filter if flow rate decreases?	Yes/No
HY-HWT-T-SP4c	d) How long would it take to resolve a problem with the filter? *(Yes if within a week)*	Yes/No

Quality Assurance:

QA-1: Overall, how would you assess the **quality** of the information collected? (*i.e. was the respondent distracted, and doing other things at the same time or not really considering the questions*?)

a) Very good ☐
b) Good ☐
c) Acceptable ☐
d) Poor ☐

QA-2:Indicate how well you think the respondent(s) **understood** the questions asked. (*i.e. was the respondent paying attention but seeming to mis-understand the questions?)*

a) Good understanding ☐
b) Fair understanding ☐
c) Poor understanding ☐

Annex 4. Sustainability Index Framework Questions

Community-managed reticulated system

WT-CRS-I-SP1	There is a water committee which has been constituted in line with national norms and standards	Scoring
WT-CRS-I-SP1a	a) Is there a water committee or *junta directiva?*	20
WT-CRS-I-SP1b	b) How many members does the water committee/*junta directiva* have? *(check boxs)* What are the requirements to be on the junta? *(Check boxes)*	20
WT-CRS-I-SP1c	c) How many women are on the committee? How many total members on the committee?	20
WT-CRS-I-SP1d	d) Has the junta directiva been democratically elected under the guidelines of the statutes?	20
WT-CRS-I-SP1e	e) Has the ASOCAR been incorporated?	20
WT-CRS-I-D1	**Roles, responsibilities of district (service authority) and ownership arrangements clearly defined**	**Scoring**
WT-CRS-I-D1a	a) Are there formalized roles and responsibilities for the service authority (INAPA-AR and CORAPLATA?)?	25
WT-CRS-I-D1b	b) Are the roles and responsibilities of the service authority written down and accessible? (*Check)*	25
WT-CRS-I-D1c	c) Are the roles and responsibilities of the service authority understood by all in the service authority involved in overseeing the water system?	25
WT-CRS-I-D1d	d) Are the roles and responsibilities of the service authority understood by the service provider?	25
WT-CRS-I-N1	**National policy, norms and guidelines for community managed water supply and enabling legislation is in place**	**Scoring**
WT-CRS-I-N1a	a) Does national policy for water supply recognize community management?	25
WT-CRS-I-N1b	b) Have national norms and standards been set on the constitution and governance of community-based service providers (e.g. water committees in terms of functions)?	25
WT-CRS-I-N1c	c) Is legislation in place that gives community management legal standing (e.g. by-laws formalizing water committees)?	25/50
WT-CRS-M-SP1	**Representative water committee actively manages water system with clearly defined roles and responsibilities**	**Scoring**
WT-CRS-M-SP1a	a) What is the role and responsibility of the water committee? *(Checkbox: Chapter 1, Article 3, Paragraph a of statutes)*	25
WT-CRS-M-SP1b	b) Does the water committee carry out all the roles required of it? No=0; some, but not all=50; All = 75	75
WT-CRS-M-SP2	**Water committee members actively participate in Committee meetings and decision making process and reporting is transparent**	**Scoring**
WT-CRS-M-SP2a	a) Are water committees meetings held?	25
WT-CRS-M-SP2b	b) How often are water committee meetings held?	25
WT-CRS-M-SP2c	c) Is there a record of committee meetings?	25
WT-CRS-M-SP2d	d) Are technical, administrative and financial records kept and shared with the community on regular basis?	25

WT-CRS-M-D1	**There is regular monitoring of water services and community management service provider and follow-up support**	**Scoring**
WT-CRS-M-D1a	a) Does INAPA (or other) representative monitor financial, technical and administrative performance of the service provider?	25
WT-CRS-M-D1b	b) How often does the INAPA-AR (or other) assessor visit the community?	some+25 , all+50
WT-CRS-M-D1c	c) Does monitoring include periodic financial audits?	25
WT-CRS-M-D2	**District/service authority drinking water plans for asset management are carried out and updated regularly**	**Scoring**
WT-CRS-M-D2a	a) Is there a water plan at the district level?	25
WT-CRS-M-D2b	b) Was the water plan developed with active participation of the district water staff?	25
WT-CRS-M-D2c	c) Is the water plan updated annually?	25
WT-CRS-M-D2d	d) Is monitoring data used to update the water plan?	25
WT-CRS-M-N1	**There is an updated national monitoring system or database available and updated**	**Scoring**
WT-CRS-M-N1a	a) Is there a national water database?	25
WT-CRS-M-N1b	b) Does the collected monitoring data include data on functionality of facilities and performance of service providers?	25
WT-CRS-M-N1c	c) Is monitoring data collected at district level sent to the national level on at least an annual basis?	25
WT-CRS-M-N1d	d) Is the national water database used to influence national water planning and budgeting?	25
WT-CRS-M-N2	**National support to district/service authority is provided, including refresher training**	**Scoring**
WT-CRS-M-N2a	a) Is the district/service authority trained to support community water systems?	25
WT-CRS-M-N2b	b) Is routine refresher training provided to district/service authority for their support for community water systems? ? If so, how often?	Some +25, All + 50
WT-CRS-M-N2c	c) Does the authority monitor the effectiveness of the training?	25
WT-CRS-F-SP1	**Tariff setting complies with national/local regulations, including social tariff**	**Scoring**
WT-CRS-F-SP1a	a) Has a water tariff been set?	25
WT-CRS-F-SP1b	b) Do national / local regulations prescribe basing the tariff on projected costs, including operation and minor maintenance costs, as well as making provision for capital maintenance (rehabilitation and replacement?)	25
WT-CRS-F-SP1c	c) How was the tariff established? *Write down class category if identified.*	25
WT-CRS-F-SP1d	d) Does the tariff make provision for the poorest within the community (e.g. through a social tariff)?	25
WT-CRS-F-SP2	**Tariff collection is regular and sufficient**	**Scoring**
WT-CRS-F-SP2a	a) Is the tariff collected on a regular schedule (e.g. monthly or quarterly instead of when there is a breakdown)?	25

WT-CRS-F-SP2b	b) What is the morosity in the community *(defined as owing more than 3 months of payments)*?	25
WT-CRS-F-SP2c	c) Income exceeds expenditure on operations and maintenance	50
WT-CRS-F-SP3	**The water committee demonstrates effective financial management and accounting**	**Scoring**
WT-CRS-F-SP3a	a) Does the water committee keep financial records? (*check)*	25
WT-CRS-F-SP3b	b) Does the committee have a bank account? Verify the balance(*check)*	25
WT-CRS-F-SP3c	c) How often does the committee share financial records with the community?	25
WT-CRS-F-SP3d	d) Are financial accounts audited? (check)	25
WT-CRS-F-D1	**Resources available for district/service authority to fulfill functions**	**Scoring**
WT-CRS-F-D1a	a) How many people are employed in the district/region? How many communities does each person oversee?	25
WT-CRS-F-D1b	b) What is the budget allocated to the district water staff to provide the required support and service?	25
WT-CRS-F-D1c	c) Is the salary for support staff competitive? Has their salary been paid to date?	50
WT-CRS-F-D2	**National/local mechanisms to meet full life cycle costs, beyond community contributions and tariffs**	**Scoring**
WT-CRS-F-D2a	a) Is there transparency of financing and expenditures in the WASH sector at all levels of government.	25
WT-CRS-F-D2b	b) Is there a budget line for this in the national budget?	25
WT-CRS-F-D2c	c) What are the national / local mechanisms in place to fill the financing gap between collected revenues and livecycle costs, where these occur?	50
WT-CRS-T-SP1	**Standpipes/ household connections (depending on system) are functional and providing basic level of service according to national policy**	**Scoring**
WT-CRS-T-SP1a	a) Are there national/local norms for reliability, accessibility (in terms of time it takes to collect water, or in terms of distance and crowding), quality and quantity for standpipes?	20
WT-CRS-T-SP1b	b) Does the standpipe/household connection meet the criteria on reliability, accessibility (for standpipes) and quality?	None=+0 ;some=+ 20; all=+40
WT-CRS-T-SP1c	c) Does the standpipe/household connection meet the criteria on quantity?	No= +0, Some=+2 0; All=+40
WT-CRS-T-SP2	**The knowledge and spare parts are available to conduct maintenance and repairs in a timely manner**	**Scoring**
WT-CRS-T-SP2a	a) Is there a trained technician or plumber in the community?	25
WT-CRS-T-SP2b	b) Do you know where and how to obtain spare parts?	25
WT-CRS-T-SP2c	c) Are there national/local norms for repair times?	25
WT-CRS-T-SP2d	d) How long did it take to repair the last breakdown of the system?	25
WT-CRS-T-SP3	**Design and quality of infrastructure: sanitary surroundings**	**Scoring**

WT-CRS-T-SP3a	a) The water source is situated greater than 30m from the nearest latrine or treated with chlorine.	25
WT-CRS-T-SP3b	b) Tap-stand has adequate drainage and is enclosed to prevent animals from accessing it.	25
WT-CRS-T-SP3c	c) The location of the source or treatment plant is not at risk of flooding.	25
WT-CRS-T-SP3d	d) The source is reliable enough (as applicable) to provide water throughout the year, including during the dry season.	25
WT-CHP-T-D1	**The district water staff are able to provide support for maintenance and repairs on request**	**Scoring**
WT-CRS-T-D1a	a) Are the district water staff able to provide technical support for maintenance and repairs on request?	100
WT-CRS-T-N1	**National/local norms defines equipment standardization and arrangements for providing spare parts**	**Scoring**
WT-CRS-T-N1a	a) Do national/local norms define equipment standardization?	50
WT-CRS-T-N1b	b) Do national/local norms define arrangements for providing spare parts?	50

Household Latrines

Code	Indicator	Scoring
SN-HHL-I-D1	**Support for maintenance and proper use of latrine in coordination with health ministry**	
SN-HHL-I-D1a	a) Are there sanitation support staff at district level?	25
SN-HHL-I-D1b	b) Are the sanitation support staff coordinated by the health ministry?	25
SN-HHL-I-D1c	c) Do the sanitation support staff promote proper use of household latrines in communities?	25
SN-HHL-I-D1d	d) Has there been follow-up by support institutions after the completion of the latrine?	25
SN-HHL-I-D2	**There are licensed and regulated septage haulers/desludgers**	
SN-HHL-I-D2a	a) Is a license required for the safe collection and disposal of septage from households to a treatment system?	25
SN-HHL-I-D2b	b) Is there a training process for haulers/desludgers to be licensed?	25
SN-HHL-I-D2c	c) Are haulers/desludgers monitored to demonstrate compliance with licensing AND penalized if needed?	25
SN-HHL-I-D2d	d) Is the community free from ALL illegal dumping?	25
SN-HHL-I-N1	**Presence of a dedicated institution with a sanitation policy at national level, with clear institutional mandates at all levels and coordination between related ministries**	
SN-HHL-I-N1a	a) Is there a national institution dedicated to sanitation and responsible for carrying out a national policy on sanitation?	25
SN-HHL-I-N1b	b) Does the national sanitation policy define clear institutional mandates at national, district and local level?	50
SN-HHL-I-N1c	c) Is there effective coordination between related ministries (i.e. ministry of health and ministry of water)?	25
SN-HHL-M-SP1	**Pit emptying services are accessible to households and households clearly**	

	understand their responsibility for pit emptying.	
SN-HHL-M-SP1a	a) Is a pit emptying service available?	25
SN-HHL-M-SP1b	b)Do you know when the pit needs emptying? Do you empty the pit when needed?	25
SN-HHL-M-SP1c	c) Households understand whose role it is to empty pit?	25
SN-HHL-M-D1	**District/local sanitation support staff carry out regular monitoring of latrine use and reactive planning/interventions**	
SN-HHL-M-D1a	a) Is monitoring of latrine use carried out by support staff?	25
SN-HHL-M-D1b	b) Is monitoring carried out at least once every 6 months (or as specified)?	25
SN-HHL-M-D1c	c) Is there continued promotion of latrine use?	25
SN-HHL-M-D1d	d) Is monitoring used to inform future sanitation planning?	25
SN-HHL-M-D2	**District sanitation plans are carried out and updated regularly**	
SN-HHL-M-D2a	a) Is there a district sanitation plan that has been developed with participation of the district sanitation team ?	25
SN-HHL-M-D2b	b) Does this intervention align with the plan as part of its implementation?	25
SN-HHL-M-D2c	c) Is the district sanitation plan updated annually?	25
SN-HHL-M-D2d	d) Is monitoring data used to update the sanitation water plan?	25
SN-HHL-M-N1	**Capacity support provided to district local government WASH staff, including refresher training**	
SN-HHL-M-N1a	a) Is local government trained to support household latrine use and maintenance?	25
SN-HHL-M-N1b	b) Is routine refresher training provided annually to local government to support household latrine use and maintenance?	25
SN-HHL-M-N1c	c) Does a budget exist to enable sufficient training to local government to support household latrine use and maintenance?	25
SN-HHL-M-N1d	M	25
SN-HHL-F-SP1	**Household ability to meet long-term operational and capital maintenance expenditure**	
SN-HHL-F-SP1a	a) What are the long term operational and capital maintenance costs of their latrine?	25
SN-HHL-F-SP1b	b) Operational and long-term capital maintenance costs are less than X% of annual household income for X% of the households.	25
SN-HHL-F-SP1c	c) Are you saving to pay for long term capital maintenance costs?	25
SN-HHL-F-SP1d	d) Are their programmes to support low-income households with the financial costs of maintaining their latrine?	25
SN-HHL-T-SP1	**Latrines constructed in-line with design criteria needed for long-term and safe use.**	
SN-HHL-T-SP1a	a) Have the latrines been constructed with all the appropriate components (e.g. slab with cover, vent)? (*check)*	25
SN-HHL-T-SP1b	b) Do latrines have handwashing facilities with soap or other cleaning agent available? *(check)*	25
SN-HHL-T-SP1c	c) Are the latrines suitable for children (e.g. child-sized slabs/holes)? *(check)*	25

SN-HHL-T-SP1d	d) Are the latrines located within 30m of a water source AND where there is little or no risk of flooding?	25
SN-HHL-T-SP2	**Latrines are readily usable by all households in terms of distance form household and number of people sharing them**	
SN-HHL-T-SP2a	a) Are there national/local norms for siting and capacity (crowding) of shared household latrines?	25
SN-HHL-T-SP2b	b) Do the latrines comply with crowding criteria? Note: Bathroom standards for schools/businesses/apartments used. At least one bathroom per unit (household)	50
SN-HHL-T-SP2c	c) Do the latrines comply with siting criteria (i.e. no further away than X meters from households)? Note: Bathroom standard for schools and businesses used. At least 10 m away from kitchen/food preparation area and less than 100 meters away from hh.	25
SN-HHL-T-SP3	**Latrines are used and valued by all**	
SN-HHL-T-SP3a	a) Do all people in the household(s) use the latrine 100% of the time?	50
SN-HHL-T-SP3b	b) Households understand the health benefits of latrines?	25
SN-HHL-T-SP3c	c) Households understand the associated economic benefits of latrines?	25
SN-HHL-T-SP4	**Latrines are well-maintained**	
SN-HHL-T-SP4a	a) If shared, Is there a regular cleaning program or someone among households who is responsible for cleaning the shared latrine?	25
SN-HHL-T-SP4b	b) Does the cleaning program include replenishment of soap and anal cleansing materials?	75
SN-HHL-T-D1	**Goods and services for maintenance, repair and emptying of household latrines available at district level**	
SN-HHL-T-D1a	a) Is equipment for repairs for latrines are available at district level?	50
SN-HHL-T-D1b	b) Are there private sector operators involved in providing support to sanitation services?	50

Institutional Latrines

Code	Description	Scoring
SN-INL-I-D1	**Clear roles and responsibilities of district / support institutions for providing support to service providers of school and institutional sanitation.**	
SN-INL-I-D1a	a) Are roles and responsibilities defined within the district/support institutions for supporting service providers of school and institutional sanitation?	25
SN-INL-I-D1b	b) Are roles and responsibilities clear and understood by all those in local gov't involved with maintenance of the facility?	25
SN-INL-I-D1c	c) Do the sanitation support staff support schools/institutions in their promotion of proper facility use?	50
SN-INL-I-D2	**There are licensed and regulated septage haulers/desludgers**	
SN-INL-I-D2a	a) Is a license required for the safe collection and disposal of septage from households to a treatment system?	25
SN-INL-I-D2b	b) Is there a training process for haulers/desludgers to be licensed?	25

SN-INL-I-D2c	c) Are haulers/desludgers monitored to demonstrate compliance with licensing AND penalized if needed?	25
SN-INL-I-D2d	d) Is the community free from ALL illegal dumping?	25
SN-INL-I-N1	**Presence of a dedicated institution with a sanitation policy at national level, with clear institutional mandates at all levels and coordination between related ministries**	
SN-INL-I-N1a	a) Is there a national institution dedicated to sanitation and responsible for carrying out a national policy on sanitation?	25
SN-INL-I-N1b	b) Does the national sanitation policy define clear institutional mandates at national, district and local level?	25
SN-INL-I-N1c	c) Is there effective coordination between related ministries (i.e. ministry of health and ministry of water)?	50
SN-INL-M-SP1	**School/institution understands responsibilities for pit/septic emptying and has capacity to manage this**	
SN-INL-M-SP1a	a) Does school/ institution know they are responsible for managing pit/septic empting?	25
SN-INL-M-SP1b	b) Does school/ institution know when the pit/septic needs emptying?	25
SN-INL-M-SP1c	c) Is there a regular schedule/plan/process for pit/septic emptying?	25
SN-INL-M-SP1d	d) Is there a record maintained to show regular pit/septic emptying? (*check*)	25
SN-INL-M-D1	**Monitoring of facility use and maintenance and follow-up support provided by district/supporting institution**	
SN-INL-M-D1a	a) Is monitoring of facility use and maintenance carried out?	25
SN-INL-M-D1b	b) Is monitoring carried out at least once every 6 months? (or as required)	25
SN-INL-M-D1c	c) Is support provided following monitoring if required?	25
SN-INL-M-D1d	d) Is monitoring used to inform future sanitation planning?	25
SN-INL-M-D2	**Support to schools/insitutions in upkeep of facilitys is available as needed**	
SN-INL-M-D2a	a) Is additional support available at district level for maintenance of school/institutional facility when requested?	50
SN-INL-M-D2b	b) Is support provided promptly, *within 1 week*, once requested?	50
SN-INL-M-N1	**National support to local government / support institutions is provided**	
SN-INL-M-N1a	a) Is local government trained to support school/ institutional facility use and maintenance?	25
SN-INL-M-N1b	b) Is routine refresher training provided annually to local government to support school/ institutional facility use and maintenance?	25
SN-INL-M-N1c	c) Is budget provided to enable sufficient training to local government to support school/ institutional facility use and maintenance?	25
SN-INL-M-N1d	d) Are additional human resources provided to local government as required to effectively support school/ institutional facility use and maintenances?	25
SN-INL-F-SP1	**Ability to meet long-term operational, minor maintenance and capital maintenance expenditure**	
SN-INL-F-SP1a	a) Does the school/ institution understand the long term operational and capital maintenance costs of their facility?	25
SN-INL-F-SP1b	b) Does the school/ institution budget include these costs?	25

SN-INL-F-SP1c	c) Does the school/ institution save to pay for long term capital maintenance costs?	25
SN-INL-F-SP1d	d) Are these funds kept separate/ or specifically tracked?	25
SN-INT-F-N1	**National/district mechanisms to meet full life cycle costs, beyond school / institution's budget**	
SN-INL-F-N1a	a) Are there funds available to support school/institutional sanitation costs beyond what schools can provide?	50
SN-INL-F-N1b	b) Is there a clear process for distributing these funds to schools/institutions?	25
SN-INL-F-N1c	c) Are their records of these funds being distributed?	25
SN-INL-T-SP1	**Bathrooms constructed in-line with design criteria needed for long-term and safe use.**	
SN-INL-T-SP1a	a) Have the Bathrooms been constructed with all the appropriate components)? (*Check)*	25
SN-INL-T-SP1b	b) Do bathrooms have handwashing facilities with soap or other cleaning agent available? (*check)*	25
SN-INL-T-SP1c	c) Are the bathrooms suitable for children (e.g. child-sized fixtures) ? (*check)*	25
SN-INL-T-SP1d	d) Is the septic tank/soak pit at least 30m away from any water source AND where there is little or no risk of flooding? (*Check)*	25
SN-INL-T-SP2	**Bathrooms are readily usable by students/users in terms of distance form institution and number of people sharing them**	
SN-INL-T-SP2a	a) Are there national/local norms for siting and capacity (crowding) of school/institutional sanitation facilities?	25
SN-INL-T-SP2b	b) Do the bathrooms comply with crowding criteria (i.e. no more than x people sharing each bathroom)?	25
SN-INL-T-SP2c	c) Are their bathrooms separated by gender with sufficient facilities for girls/women? (*Check)*	25
SN-INL-T-SP2d	c) Do the bathrooms comply with siting criteria (i.e. no further away than 100 meters from school)?	25
SN-INL-T-SP3	**Well-maintained sanitation facilities which are being used**	
SN-INL-T-SP3a	a) Do all students in the schools use the facilities 100% of the time?	25
SN-INL-T-SP3b	b) Is there a regular cleaning program which is documented?	25
SN-INL-T-SP3c	b) Is the cleaning program documented?	25
SN-INL-T-SP3d	c) Does the cleaning program include replenishment of anal cleansing materials?	25
SN-INL-T-D1	**Goods and services for maintenance, repair and emptying of septic tanks available at district level**	
SN-INL-T-D1a	a) Consumables and equipment for repairs for facilities are available at district level.	50
SN-INL-T-D1b	b) Are there private sector operators involved in providing support to sanitaion services	50

Household Water Treatment

Code	Description	Scoring
HY-HWT-I-N1	**Official acceptance of household water treatment in national policy and promotion documents.**	**Scoring**
HY-HWT-I-N1a	a) Is there a national policy that supports household water treatment?	50
HY-HWT-I-N1b	b) Does the Municipal Government play a role in carrying out national policy by promoting and supporting household water treatment?	50
HY-HWT-M-SP2	**Community facilitator or promoter with capacity to monitor and provide regular follow-up support to households in HWT, including refresher training**	**Scoring**
HY-HWT-M-SP2a	a) Are there community facilitators or promoters?	25
HY-HWT-M-SP2b	b)Have community facilitators conducted follow up visits to households after filter installation? (*At least two visits)*	25
HY-HWT-M-SP2c	c) Do the community facilitators/ promoters provide support to households following monitoring of HWT practices?	25
HY-HWT-M-SP2d	d) Do the community facilitators/ promoters provide refresher training to households about HWT?	25
HY-HWT-M-D1	**Support to promoters for monitoring use and maintenance of HWT provided, including refresher training**	**Scoring**
HY-HWT-M-D1a	a) Are hygiene promoters/ facilitators supervised?	25
HY-HWT-M-D1b	b) Is support available to hygiene promoter/ facilitators about HWT when requested?	25
HY-HWT-M-D1c	c) Is there follow-up when support is needed?	25
HY-HWT-M-D1d	d) How often is refresher training on HWT provided?	25
HY-HWT-F-D1	**HWT products, including replacement filters available in local markets and are affordable**	**Scoring**
HY-HWT-F-D1a	a) Are HWT products, including replacement filters, available in the local market?	25
HY-HWT-F-D1b	b) How much would you pay for a replacement filter? *Compare with actual price of filters.*	25
HY-HWT-F-D1c	c) How much did you pay for the filter?	25
HY-HWT-F-D1d	d) If your filter stopped working, how could you get replacement?	25
HY-HWT-F-N1	**National/local mechanisms to meet full cost of ongoing support to households and (re)training**	**Scoring**
HY-HWT-F-N1a	a) Is there a national/ local budget for continued service of water facilitators (e.g. facilitator re-training?)	100
HY-HWT-T-SP1	**Knowledge of correct use of HWT**	**Scoring**
HY-HWT-T-SP1a	a) Does household know proper use of filter. *Observe for the following: 1) diffuser plate in place when water added, 2) spout is unobstructed and clean, 3) lid is replaced after filling,*	50
HY-HWT-T-SP1b	b) Do you clean your filter? (IF YES) When? *Verify that external components are cleaned regularly, and bio layer is gently cleaned when flow decreases*	25
HY-HWT-T-SP1c	c) Can household explain how to properly clean filter? *Family member*	25

	can adequately demonstrate or describe process of cleaning filter.	
HY-HWT-T-SP2	**Households practice safe water storage**	**Scoring**
HY-HWT-T-SP2a	a) As interviewee explains practices, observe/listen for the following: 1) separate container used to collect filtered water 2) container is clean 3) container is covered or small mouthed	50
HY-HWT-T-SP2b	b) Household understand how to treat filtered water with chlorine and show the chlorine eye dropper? *1 drop of chlorine per gallon of water, stir and wait 3 minutes before consuming.*	50
HY-HWT-T-SP3	**Regular use and overall acceptability (time, taste etc.)**	**Scoring**
HY-HWT-T-SP3a	a) How often do you add water to your filter?	25
HY-HWT-T-SP3b	b) How often do you use filtered water for purposes other than drinking?	25
HY-HWT-T-SP3c	c) Do you like the taste of the filtered water?	25
HY-HWT-T-SP3d	d) Are households overall satisfied with the filter?	25
HY-HWT-T-SP4	**Community or technician able to provide maintenance and repairs**	**Scoring**
HY-HWT-T-SP4a	a) Are households or local technicians able to carry out repairs?	25
HY-HWT-T-SP4b	b) Is technician able to reinstall filter if flow rate decreases?	50
HY-HWT-T-SP4c	c) How long would it take to resolve a problem with the filter?	25

Handwashing Promotion

Code	Description	Scoring
HY-HWP-I-D1	**Coordination and support for hygiene promotion by district authority and other agencies (Ministry of Health)**	**Scoring**
HY-HWP-I-D1a	a) Is the munipal government involved with hygiene promotion?	25
HY-HWP-I-D2b	b) Does the municpal government liase with the ministry of health or their local authorities (direccion provincial de Salud)?	25
HY-HWP-I-D3c	c) Are the activities of the municipal government conducted in coordination with the hygiene promotion activities of the ministry of health?	25
HY-HWP-I-D4d	d) Do the municipal government AND/OR Ministry of Health provide staff OR resources for hygiene promotion in the district?	25
HY-HWP-I-N1	**Hygiene promotion, including handwashing, as a recognized government policy**	**Scoring**
HY-HWP-I-N1a	a) Is hygiene promotion a recognized government policy, overseen by specified ministry (Ministry of Health)?	50
HY-HWP-I-N1b	b) Is handwashing part of the government's hygiene policy?	50
HY-HWP-I-N2	**Existence of hygiene promotion/behavior change program with clear designation of responsibilities in national ministry (-ies)**	**Scoring**
HY-HWP-I-N2a	a) Is there a national hygiene promotion/behavior change program?	50
HY-HWP-I-N2b	b) Does the national hygiene promotion/behavior change program clearly designate responsibilities in national ministries?	50
HY-HWP-M-SP1	**Community facilitator or promoter with capacity to monitor and provide follow-up support to households , including refresher training**	**Scoring**

HY-HWP-M-SP1a	a) Are there community facilitators or hygiene promoters?	25
HY-HWP-M-SP1b	b) Do the community facilitators/ promoters monitor hygiene practices of households?	25
HY-HWP-M-SP1c	c) Do the community facilitators/ promoters provide support to households following monitoring of hygiene practices as needed?	25
HY-HWP-M-SP1d	d) Do the community facilitators/ promoters provide refresher training to households about good hygiene practices?	25
HY-HWP-M-D1	**Monitoring and follow-up support provided to community hygiene promoter/facilitator, including refresher training**	**Scoring**
HY-HWP-M-D1a	a) Are hygiene promoters/ facilitators monitored?	25
HY-HWP-M-D1b	b) Is support available to hygiene promoters/ facilitators when requested?	25
HY-HWP-M-D1c	c) Is support provided to hygiene promoters/ facilitators following reporting?	25
HY-HWP-M-D1d	d) Is refresher training provided annually to hygiene promoters/ facilitators?	25
HY-HWP-F-SP1	**Willingness and ability to pay for hygiene products, including soap**	**Scoring**
HY-HWP-F-SP1a	a) Do you buy soap and how often?	50
HY-HWP-F-SP1b	b) Does the household currently have soap or other cleansing agent available (e.g. ash)? (*check)*	50
HY-HWP-F-D1	**Soap and other hygiene products available in the community**	**Scoring**
HY-HWP-F-D1a	a) Is soap available in the community?	25
HY-HWP-F-D1b	b) Can you purchase sanitary napkins in the community?	25
HY-HWP-F-D1c	c) How do you dry your dishes?	25
HY-HWP-F-D1d	d) Can you buy other hygiene products in the community (detergent, toothpaste, shampoo, cholorine).	25
HY-HWP-F-N1	**National/local mechanisms to meet full cost of hygiene and hand washing promotion**	**Scoring**
HY-HWP-F-N1a	a) Is there a local budget for implementing hygiene promotion program (e.g. facilitator training?)	50
HY-HWP-F-N1b	b) Are there supplementary National funds available for hygiene and handwashing promotion?	25
HY-HWP-F-N1c	c) Is there a social program to provide low-income households with hygiene products?	25
HY-HWP-T-SP1	**Knowledge of handwashing and correct use of facilities by households**	**Scoring**
HY-HWP-T-SP1a	a) Can you please show me the proper way to wash your hands?	50
HY-HWP-T-SP1b	b) When should you wash your hands? *(Check box: before/after food preparation, before eating, after going to the bath room or handling diapers)*	50

Annex 5. Average Indicator Scores

See excel file for raw data sheets, scoring of questions, and indicators by community.

Average Indicator Scores for each intervention:
Purple= Institutional, Pink =Management, Yellow= Financial, Green=Technical

Community-managed reticulated systems

Code	Indicators	Avg. score
WT-CRS-I-SP1	There is a water committee which has been constituted in line with national norms and standards	63%
WT-CRS-I-D1	Roles, responsibilities of district (service authority) and ownership arrangements clearly defined	71%
WT-CRS-I-N1	National policy, norms and guidelines for community managed water supply and enabling legislation is in place	75%
WT-CRS-M-SP1	Representative water committee actively manages water system with clearly defined roles and responsibilities	83%
WT-CRS-M-SP2	Water committee members actively participate in Committee meetings and decision making process and reporting is transparent	83%
WT-CRS-M-D1	There is regular monitoring of water services and community management service provider and follow-up support	38%
WT-CRS-M-D2	District/service authority drinking water plans for asset management are carried out and updated regularly	21%
WT-CRS-M-N1	There is an updated national monitoring system or database available and updated	71%
WT-CRS-M-N2	National support to district/service authority is provided, including refresher training	50%
WT-CRS-F-SP1	Tariff setting complies with national/local regulations, including social tariff	54%
WT-CRS-F-SP2	Tariff collection is regular and sufficient	67%
WT-CRS-F-SP3	The water committee demonstrates effective financial management and accounting	63%
WT-CRS-F-D1	Resources available for district/service authority to fulfill functions	0%
WT-CRS-F-D2	National/local mechanisms to meet full life cycle costs, beyond community contributions and tariffs	0%
WT-CRS-T-SP1	Standpipes/ household connections (depending on system) are functional and providing basic level of service according to national policy	70%
WT-CRS-T-SP2	The knowledge and spare parts are available to conduct maintenance and repairs in a timely manner	54%
WT-CRS-T-SP3	Design and quality of infrastructure: sanitary surroundings	92%
WT-CHP-T-D1	The district water staff are able to provide support for maintenance and repairs on request	67%
WT-CRS-T-N1	National/local norms defines equipment standardization and arrangements for providing spare parts	50%

Household Latrine Indicator Scores

Code	Indicators	Avg. score
SN-HHL-I-D1	Support for maintenance and proper use of latrine in coordination with health ministry	25%
SN-HHL-I-D2	There are licensed and regulated septage haulers/desludgers	25%
SN-HHL-I-N1	Presence of a dedicated institution with a sanitation policy at national level, with clear institutional mandates at all levels and coordination between related ministries	25%
SN-HHL-M-SP1	Pit emptying services are accessible to households and households clearly understand their responsibility for pit emptying.	0%
SN-HHL-M-D1	District/local sanitation support staff carry out regular monitoring of latrine use and reactive planning/interventions	50%
SN-HHL-M-D2	District sanitation plans are carried out and updated regularly	0%
SN-HHL-M-N1	Capacity support provided to district local government WASH staff, including refresher training	0%
SN-HHL-F-SP1	Household ability to meet long-term operational and capital maintenance expenditure	0%
SN-HHL-T-SP1	Latrines constructed in-line with design criteria needed for long-term and safe use.	54%
SN-HHL-T-SP2	Latrines are readily usable by all households in terms of distance form household and number of people sharing them	46%
SN-HHL-T-SP3	Latrines are used and valued by all	54%
SN-HHL-T-SP4	Latrines are well-maintained	100%
SN-HHL-T-D1	Goods and services for maintenance, repair and emptying of household latrines available at district level	0%

Institutional Latrine Indicator Scores

Code	Indicator	Avg. Score
SN-INL-I-D1	Clear roles and responsibilities of district / support institutions for providing support to service providers of school and institutional sanitation.	0%
SN-INL-I-D2	There are licensed and regulated septage haulers/desludgers	0%
SN-INL-I-N1	Presence of a dedicated institution with a sanitation policy at national level, with clear institutional mandates at all levels and coordination between related ministries	25%
SN-INL-M-SP1	School/institution understands responsibilities for pit/septic emptying and has capacity to manage this	50%
SN-INL-M-D1	Monitoring of facility use and maintenance and follow-up support provided by district/supporting institution	19%
SN-INL-M-D2	Support to schools/institutions in upkeep of facilities is available as needed	50%
SN-INL-M-N1	National support to local government / support institutions is provided	25%
SN-INL-F-SP1	Ability to meet long-term operational, minor maintenance and capital maintenance expenditure	31%
SN-INT-F-N1	National/district mechanisms to meet full life cycle costs, beyond school / institution's budget	63%
SN-INL-T-SP1	Bathrooms constructed in-line with design criteria needed for long-term and safe use.	88%
SN-INL-T-SP2	Bathrooms are readily usable by students/users in terms of distance form institution and number of people sharing them	81%
SN-INL-T-SP3	Well-maintained sanitation facilities which are being used	44%
SN-INL-T-D1	Goods and services for maintenance, repair and emptying of septic tanks available at district level	63%

Household Water Treatment Indicator Scores

Code	Indicator	Bio-sand avg. score	Ceramic filter avg. score
HY-HWT-I-N1	Official acceptance of household water treatment in national policy and promotion documents.	0%	0%
HY-HWT-M-SP2	Community facilitator or promoter with capacity to monitor and provide regular follow-up support to households in HWT, including refresher training	90%	100%

HY-HWT-M-D1	Support to promoters for monitoring use and maintenance of HWT provided, including refresher training	67%	25%
HY-HWT-F-D1	HWT products, including replacement filters available in local markets and are affordable	19%	0%
HY-HWT-F-N1	National/local mechanisms to meet full cost of ongoing support to households and (re)training	8%	0%
HY-HWT-T-SP1	Knowledge of correct use of HWT	56%	0%
HY-HWT-T-SP2	Households practice safe water storage	77%	50%
HY-HWT-T-SP3	Regular use and overall acceptability (time, taste etc.)	88%	25%
HY-HWT-T-SP4	Community or technician able to provide maintenance and repairs	90%	0%

Handwashing Promotion

Code	Indicator	Avg. Score
HY-HWP-I-D1	Coordination and support for hygiene promotion by district authority and other agencies (Ministry of Health)	68%
HY-HWP-I-N1	Hygiene promotion, including handwashing, as a recognized government policy	0%
HY-HWP-I-N2	Existence of hygiene promotion/behavior change program with clear designation of responsibilities in national ministry (-ies)	50%
HY-HWP-M-SP1	Community facilitator or promoter with capacity to monitor and provide follow-up support to households , including refresher training	64%
HY-HWP-M-D1	Monitoring and follow-up support provided to community hygiene promoter/facilitator, including refresher training	99%
HY-HWP-F-SP1	Willingness and ability to pay for hygiene products, including soap	97%
HY-HWP-F-D1	Soap and other hygiene products available in the community	80%
HY-HWP-F-N1	National/local mechanisms to meet full cost of hygiene and hand washing promotion	25%
HY-HWP-T-SP1	Knowledge of handwashing and correct use of facilities by households	66%

Annex 6. List of documents reviewed

Dominican Legislative Documents:

Law No 1-12
Law 06/65
Law 42/2001
Regulation 528-01
Law 64/2000
Law 841/35
Law 602/77
Law 3894/54
Law 130/42

Alliance Documents:

Request for Application Number 517-08-010 (RFA 517-08-010) Batey Community Development Project. June 2008
Memorandum of Understanding (MOU) between Rotary District 4060 and USAID-DR Mission representatives signed on June 5, 2010.Terms of Reference between Rotary District 4060 and Save the Children DR
2011 Rotary International Request for Proposal Sustainability Index of WASH Activities & Alliance EvaluationThe Batey Community Development Project FY 2011 Annual Results Report
The Batey Community Development Project FY2011 Environmental Mitigation Report
The Batey Community Development Project October -December 2011 Quarterly Performance Report
The Batey Community Development Project July -September 2011 Quarterly Performance Report
Annex 1- Batey Community Development Project Annual Implementation Plan- 2012
Grant #70426 Project Application
12 month Progress Report-Rotary District 4060 3-H Grant 70426
Instructivo para Clubes Rotarios y Comunidades Proyecto H2O Sana Para Los Niños 3H 70426

Others:

AECI. (2001). *Programa de Agua Potable y Saneamiento en Zonas Rurales.* Agencia Española de Cooperación Internacional-Embajada Española y INAPA. Santo Domingo, Dominican Republic.

CAWST (2010) Bien Estar a Traves del Agua. The Centre for Affordable Water and Sanitation Technology (CAWST). Calgary, Alberta.

CAWST/Project Las Americas (2009) Filtro BioArena Versión HydrAid Manual de Operación y Mantenimiento. ALIANZA DE AGUA SANA PARA LOS NIÑOS. The Centre for Affordable Water and Sanitation Technology (CAWST). Santo Domingo, Dominican Republic.

ENTRENA (2010) Agenda: Capacitacion de filtros de bioarena. Santo Domingo, Republica Dominicana.

INAPA-UEAR. (2007*). Estrategia de Descentralización de Acueductos Rurales*. Instituto Nacional de Aguas Potables y Alcantarillado (INAPA), Santo Domingo, Republica Dominicana

INAPA. (2008). "Proyecto Decentralization de Acueductos Rurales-Reglamentos para la interrelación del INAPA con las ASOCARs" Internal publication for opertions. Instituto Nacional de Aguas Potables y Alcantarillado (INAPA), Santo Domingo, Republica Dominicana.Mercedes, M. (2009). Presentación Componente Saneamiento en Proyecto Desarrollo de Bateyes Públicos en Provincias de San Pedro de Macorís y Hato Mayor. Powerpoint Presentation given to Save the Children DR.

Mercedes, M (2010). Estudio de calidad de agua en Proyecto Dessarrollo Comunitario de Bateys de FUDECO-Save the Children y MUDE.

Mercedes, M. (2012). Consultoría para Mejorar la Calidad del Agua Potable en Bateyes Públicos de SPM y Hato Mayor (2da. Parte). Presentation given to MUDE/FUDECO May 7,2012.

Miller, Gabriel (2011). Clean Water Supply Projects La Descubierta, La Gotara, and Los Uveros, Dominican Republic.
MUDE (2010). Terminos de Referencia para contratación de obras de infraestructura. Mujeres en Desarrollo Dominicano. Santo Domingo, Republica Dominicana.

MMARN (2002) Reglamentos del sistema de permisos y licencias ambientales. Secretaria de Estado de Medio Ambiente y Recursos Naturales. Santo Domingo, Republica Dominicana.

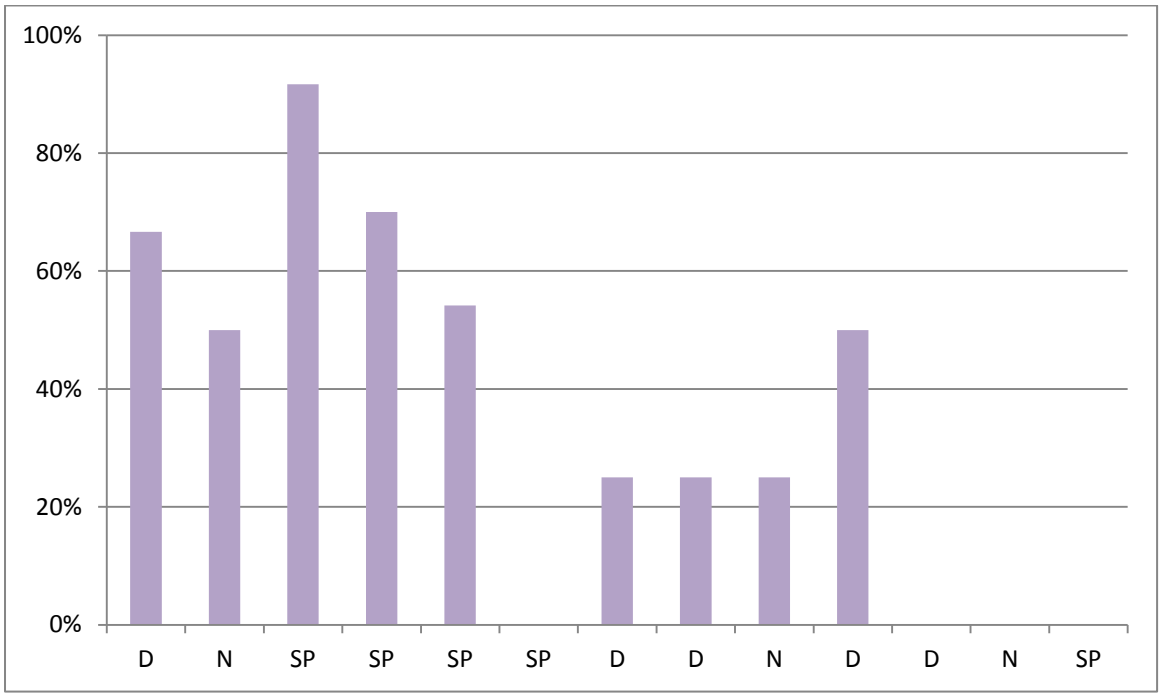
MMARN (2004) Reglamento para la amplicacion de La Ley 487. Secretaria de Estado de Medio Ambiente y Recursos Naturales, Subsecretaría de Suelos y Aguas. Santo Domingo, Republica Dominicana.

MOPC (2009) Especificaciones generales para la construcción de edificaciones M-009. Secretaria de Obras Publicas y Comunicaciones. Santo Domingo, Republica Dominicana.

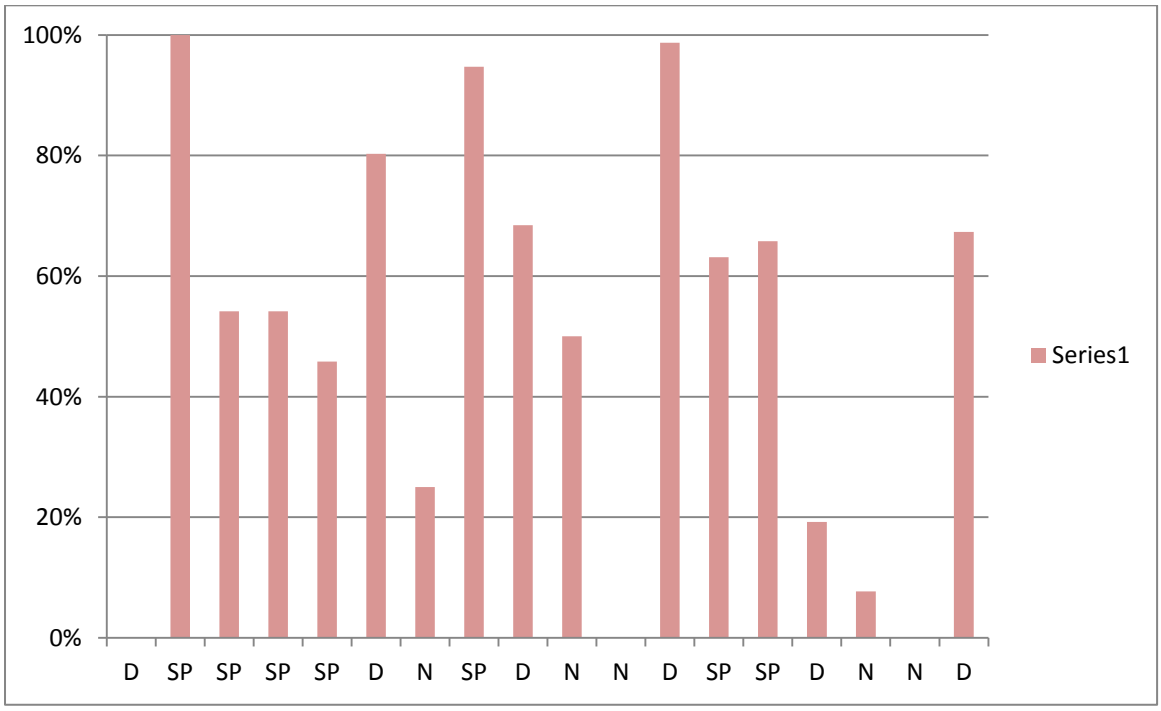
MOPC (2008) Reglamentos para el diseño y la construcción de instalaciones sanitarias y edificaciones. R-008 Decreto 572-1. Secretaria de Obras Publicas y Comunicaciones. Santo Domingo, Republica Dominicana.

Annex 7 –Indicators by Factor (See excel file "overview analysis")

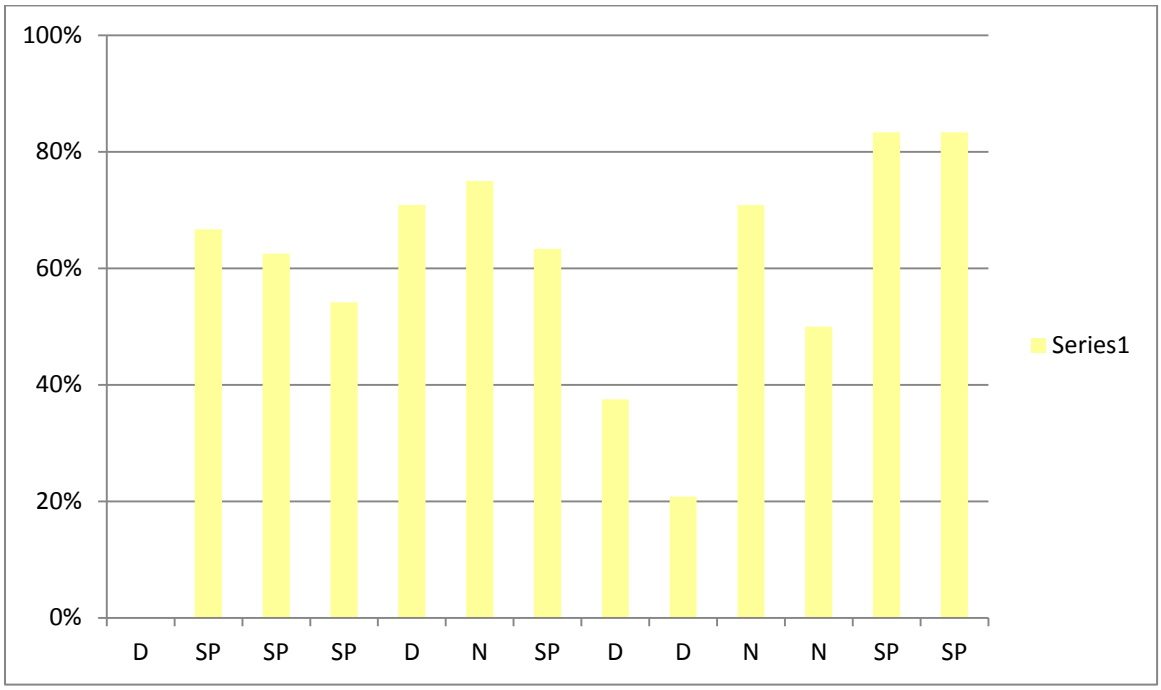
Institutional Indicator Scores



Management Indicator Scores



Financial Indicator Scores



Technical Indicator Scores