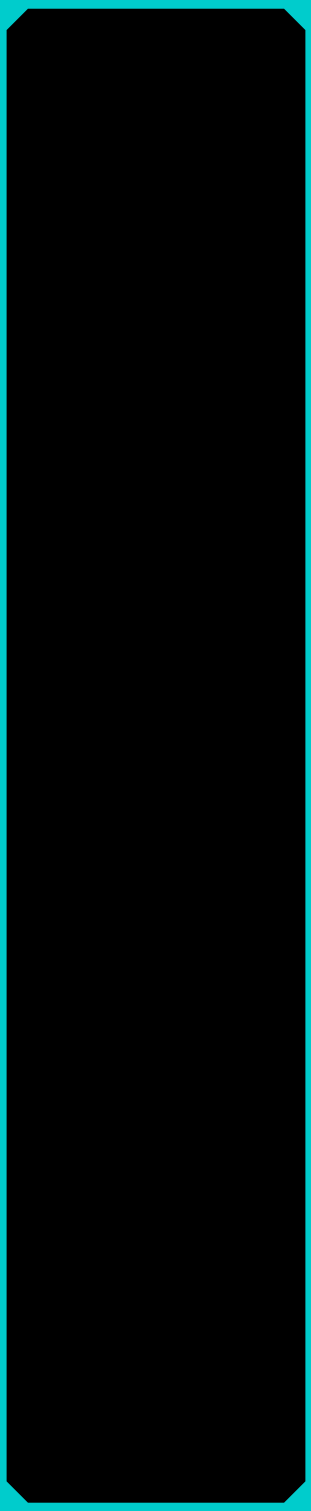
WATER AND SANITATION

Innovations you didn't know were from Latin America and the Caribbean

IDB

Table of Contents

Introduction



By 2015, the countries in Latin America and the Caribbean (LAC) had reached most key Millennium Development Goals (MDGs). For example, 95% coverage of basic water services and 83% coverage of basic sanitation services had been achieved (ECLAC, 2015).

However, according to the more ambitious Sustainable Development Goals (SDG 6.1.1, SDG 6.2.1, and SDG 1.4.1) for “safely managed” water and sanitation, those coverage figures drop to 65% (water) and 23% (sanitation), which means that at least 220 million people still lack access to safe water services, and potentially over 480 million people, in the case of safe sanitation (Sparkman and Sturzenegger, 2017).

95%

of basic water service coverage was achieved in 2015, according to MDGs

65%

of basic water service coverage was achieved in 2015, according to SDGs

83%

of basic sanitation service coverage was achieved in 2015, according to MDGs

23%

of basic sanitation service coverage was achieved in 2015, according to SDGs

The global source of relevant Water and Sanitation statistics and metrics is JMP (a joint program between the World Health Organization -WHO- and the United Nations Children's Fund -UNICEF-, *Joint Monitoring Programme for Water Supply, Sanitation and Hygiene*.) This program is responsible for overseeing progress towards the achievement of SDGs 2030 related to Water, Sanitation, and Hygiene. In its 2017 report, it states:

"On September 25th 2015, member countries of the United Nations adopted the 2030 Agenda for Sustainable Development – a set of 17 sustainable development goals (SDGs) and 169 targets integrating social, economic and environmental development aspects to end poverty, protect the planet, and ensure prosperity for all. SDGs are defined as aspirational global targets designed to be universally relevant and applicable to different countries, with each government setting its own national level of targets taking into account their own national circumstances. Global indicators will be overseen by agencies designated to do so, relying on internationally consistent definitions and methods of evaluation. National goals will be monitored by local authorities, and some definitions may differ from those applied internationally"

(UNICEF and WHO, 2017, p.6.)).

To meet the criteria for safe water services, (SDG 6.1), a person must have access to a safe water source in compliance with the following:

- The source must be available at the point of use - household/ building/school
- The source must be available when required
- The source must be free of pollutants

If the safe water source doesn't meet these points but going to pick up water and bring it back takes 30 minutes or less, it shall be classified as a basic clean water service (SDG 1.4). If collecting water takes longer than 30 minutes, it shall be considered a limited service.

In order to meet the criteria for safe sanitation services (SDG 6.2), a person must have access to a safely managed sanitation facility which is not shared with other cohabitants, and faecal wastes must be:

- treated and disposed of in situ,
- temporarily stored and then emptied so as to be treated offsite, or
- transported by a sewage system and treated offsite.

If the excreta in improved sanitation facilities are not managed safely, then the people using such facilities shall be classified as having access to basic sanitation services (SDG 1.4).

Conventional and commercial approaches and strategies for the provision of WASH services will be inadequate to face the toughest challenges in SDG 6.1.1 and 6.2.1. There is still a clear lack of economic and financial resources as well as local executing capabilities in most countries in the region. To achieve and effectively sustain the SDGs by 2030, the adoption and incorporation of innovative models to expand, improve, and maintain WASH services must be deployed throughout the entire region.

Given the scope, the ambition, and the diversity of SDG goals, the governments in LAC will be unable to meet them on their own and shall therefore need to explore and develop synergic collaboration models between government, civil society, and the private sector.

The gap that exists to achieve safe water and sanitation levels in our region is still very significant; in fact, multiple actions and policies with very different approaches and strategies are necessary to contribute to bridging it. To attain universal access to water, the region would need to invest *at least* US$28 billion; the investment in sanitation would have to be even greater: US$49 billion. By 2030, we would need to reduce the percentage of untreated water by half, which requires an additional investment that in large urban centers alone is estimated to be an additional US$30 billion (Campos, 2016).

US$ 28 billions
to achieve universal access to water

US$ 49 billions
to achieve safe sanitation

US$ 30 billions
to reduce the percentage of untreated water by half by 2030

The Inter-American Development Bank (IDB) acknowledges that leveraging economic and financial resources through conventional programs only will not be enough to reach the goals -basically due to the region's lack of economic resources. That's why, among other strategies, it believes that developing and enhancing the region's innovation capacity should be one of the main strategies to bridge the gap. This does not imply stopping to promote conventional service provision programs, but to recognize the fundamental role of innovation as a catalyst and solution generator in scaling water and sanitation to impact a solid, critical mass of beneficiaries. There is consensus between multilateral organizations that:

"Although civil society organizations and service providers share the responsibility of improving access to basic services with national, regional, and local authorities, this role has been undertaken mainly by the public sector. Nevertheless, in many occasions, governments are limited to fulfill this task by the absence of local capabilities, deficient accountability, and unstable financial investment. To face this situation and reduce these differences in service access, multi-stakeholder alliances have come together to offer innovative local sustainable solutions. A huge part of the alliance model is based on improving existing systems by incorporating technological, financial, and methodological innovations that allow services to expand and improve for the benefit of marginal populations"

(ITD-UPM and MIF, 2014, p. 6).

Our research confirms that there is a significant critical mass of innovations in this sector in LAC which is little known or circulated both within the sector and by the mass media.

Considering the fundamental role of innovation to bridge the existing gap in the region is not an idea or a goal laid out from an ivory tower or some strategic think tank, neither does it imply emulating what has been done in other more developed regions of the world. On the contrary, there has been ample evidence backed by hard data and analytics for many years supporting the notion that innovation is already playing a key role in significantly extending access to safe water and sanitation for the population of Latin America and the Caribbean. Hence the importance of propagating such innovation efforts, which in the region have their own social, economic, and technological characteristics, and which take the existent wealth and diversity creatively, guaranteeing their sustainable scalability. These features also make them potentially scalable to other similar regions in the world.

The main goal of this publication is to investigate and disseminate the innovations in the water and sanitation sector of Latin America and the Caribbean (LAC). This sector has innovative dynamics that differ from others such as those closely linked to information and communications technology (ICT) (e.g. fintech, e-health, intelligent transport), because the type of innovations in W&S are generally more incremental than disruptive and innovation is often vested in the public sector -historically more conservative and slower when it comes to implementing a proactive culture of innovation. (*For a definition of disruptive innovation see Christensen, n.d.*). In effect, the kinds of innovation that have had a larger impact in LAC are the result of excellent and creative combinations of social and organizational innovations with technological innovations. At the same time, there are outstanding examples which have had significant impacts on gender equality, where low-income women have a high level of participation and control, and are able to own the results achieved. Creativity and processes of innovation to attain a fluent and dynamic public-private articulation with academia and multilateral organizations is paramount for high impact. In this sense, the innovative processes may seem slower than those seen in technology developed by full-fledged technological companies or startups, and involve longer time-to-market cycles. Nevertheless, they are vital to achieving powerful long-term results due to their adaptability to the region's social, economic, and technological conditions.

Fifty-two innovation cases were analyzed for this purpose going back 10 years (from 2007 onwards), which generated a very high number of beneficiaries relative to the LAC population lacking access to safe water and sanitation. Although the number of innovations is clearly higher, this paper does not analyze every innovation in LAC, but confirms that innovation is indeed a key vector to achieve the ambitious safe water and sanitation goals laid out in 2015 by the UN (2030 Agenda for Sustainable Development).

The top 20 innovations in LAC have been selected based on a rigorous methodology and different impact metrics. This publication analyzes these cases, taken from a wide variety of LAC regions, to understand the types of innovation, impact reached, implemented innovation processes, and scalability potential. These 20 innovations truly constitute examples to be followed and are a source of inspiration to innovate more and more in every country in LAC; hopefully, giving visibility to the best innovations will contribute towards that end.

As previously mentioned, this study finds that the most common types of innovation in this sector in LAC include not only technological but most often social/organizational innovations which -together with technology - hold the power to scale up and generate high-impact changes. In this sense, it is especially important to promote identified and selected innovations given that some articulation capacities may be underutilized in LAC to foster innovation in the public sector, private sector, citizenry/community, academia, and multilateral organizations.

In this sense, the second part of the publication includes descriptions of the innovative initiatives fostered by the IDB, which have contributed to consolidate and leverage the innovative ecosystem for the sector in LAC, as well as to develop a proactive innovative culture.

This paper constitutes an initial effort to describe as systematically as possible the innovative activities in Latin America. To date, it has been the most thorough at doing so.

Methodology for selecting innovations in water and sanitation in Latin America and the Caribbean

1

Dimensions and categories for gathering data on innovations in LAC

This report was put together after systematically searching for innovation in LAC from different sources of information making sure that there was at least one case per innovation category defined for each of the following dimensions: addressed topic, region in LAC where it is implemented, area of application, type of organization, type of innovation, and the innovation's level of maturity.

Dimension	Category
Topic	1 2 3 4 5 6
Secondary topic	1 2 3
Region of implementation	1 2 3 4
Area of application	1 2 3
Type of organization	1 2 3 4 5
Type of innovation	1 2 3
Level of maturity	1 2 3

Topic*

1 Water
Solutions that promote safe access to drinking water for the population or ensure its quality. Also in this category, innovations that aim at resilience regarding disasters linked to floods or water scarcity

2 Sanitation
Alternative solutions to safe sanitation apart from conventional urban sewage networks or innovations to such networks

3 Waste
Solutions for treatment, recycling, and final disposal of urban waste, or improvements to the quality of life of people working in the sector

4 Hygiene
Solutions that enable or improve the hygienic conditions of people in connection to water and waste

5 Green infrastructure
Solutions that rely on nature to offer important services to communities, protecting them against floods or excessive heat, or helping improve air, soil, and water quality. When nature is utilized by people and used as an infrastructure system, it is called "green infrastructure." This happens on every scale. In most cases, it is associated with storm water management systems, which are intelligent and profitable; however, it really is a broader concept and one that is closely associated with many other elements. It can also be used to offer an ecological framework to social, economic, and environmental health ('Green infrastructure', n.d.)

6 Water reuse
Solutions that allow wastewater to be reutilized so as to contribute to preserving water as a resource

Secondary topic*

(These topics are additionally addressed in some of the mentioned cases)

1 Health
Solutions regarding the administration, use, or management of water and urban waste that contribute to preserving people's health

2 Resilience
Solutions that improve the populations' resilience regarding incidents linked to water

3 Inclusion of creative industries
Solutions where creativity, crafts, and art play a significant role to achieve the desired goals

Region of implementation*

(Uses IDB-2017 geographic definition for LAC)

1 Southern Cone
Argentina, Brazil, Chile, Uruguay, Paraguay

2 Andean Group
Bolivia, Colombia, Ecuador, Peru, Venezuela

3 Central America, Dominican Republic, Haiti, Mexico, and Panama
Belize, Costa Rica, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama

4 Caribbean
Bahamas, Barbados, Guyana, Jamaica, Suriname, Trinidad and Tobago

Area of application

1 Urban
Solutions for urban populations

2 Rural
Solutions for rural and periurban populations

3 Rural / Urban
Solutions that adapt to both urban and rural populations

Type of organization

(Type of organization leading the innovation)

1 Enterprise
Includes startups, SMEs, large enterprises

2 Non-profit organizations
Includes NGOs, foundations, civil associations

3 Academia
Includes universities, research hubs, educational programs, and technology transfer

4 Government
Includes government organizations, among them municipal governments

5 Alliance
Innovations that imply associations between different types of organizations, including public-private partnerships (PPPs)

Type of innovation

1 Technological
Innovations based on applying, adapting, or developing new technologies, infrastructure, and knowledge

2 Social-organizational
Innovations based on novel ways of social, business, or government organization focused on behavioral change, generating awareness or strengthening the culture of personal care and care of water as a resource, or tending to ownership of the communities over their resources

3 Technological / Social-organizational
Innovations based on new technologies, infrastructures and knowledge as well as on new forms of social, business, or government organization

Level of maturity

1 Emerging
Innovations that have been implemented for less than two years

2 Semi-consolidated
Innovations that have been implemented for less than five years

3 Consolidated
Innovations that have been implemented for more than five years – a track record long enough to see verifiable results and perhaps even their impacts

* The categories defined for this dimension are not mutually excluding. A single case could qualify in more than one category of this dimension

Overview of the 52 selected innovations by category

The 52 selected innovations convey at least one example of each of the 27 categories defined for this report.

Overview of the 52 innovations

By level of maturity

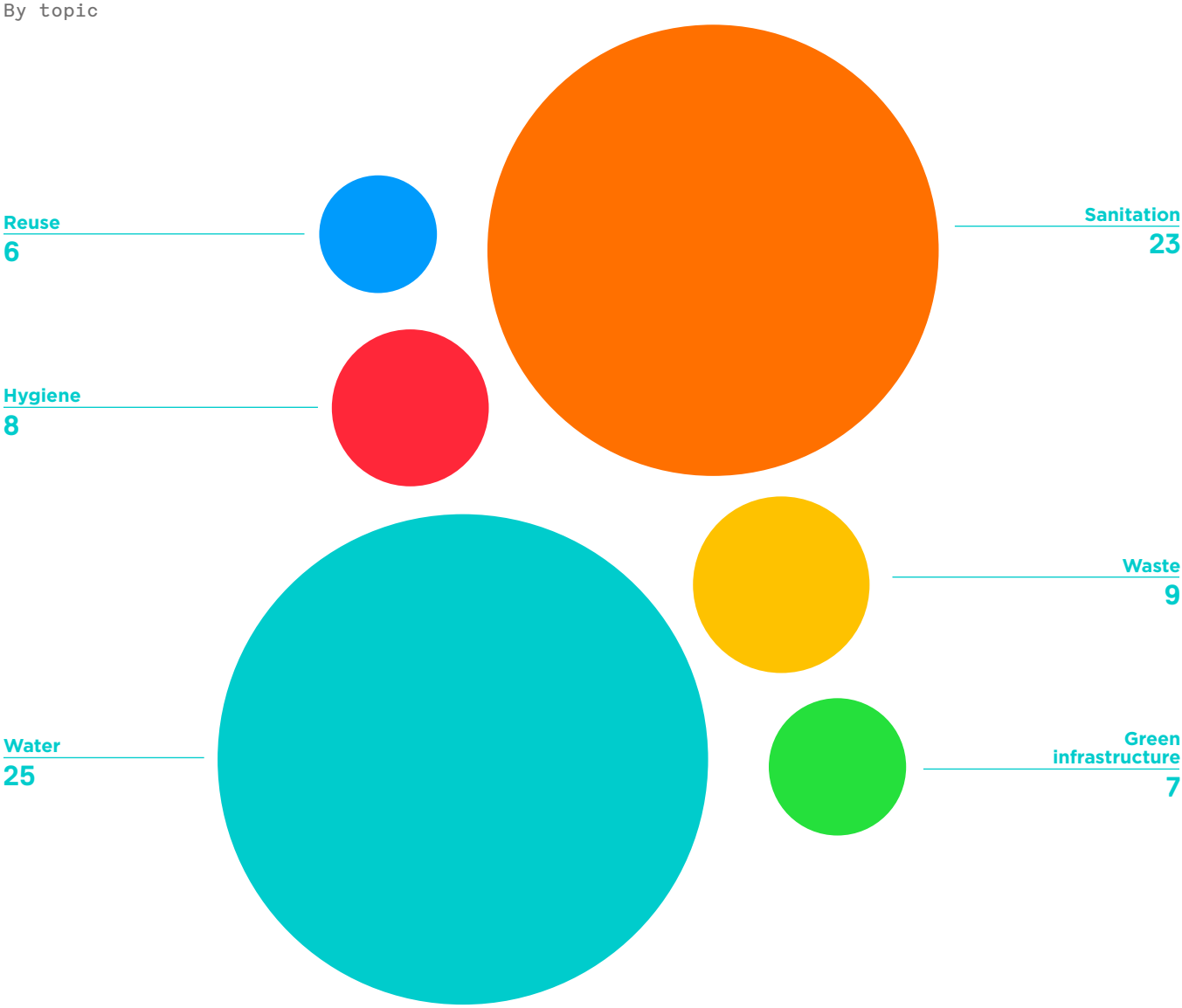
19
Consolidated

19
Semi-consolidated

14
Emerging

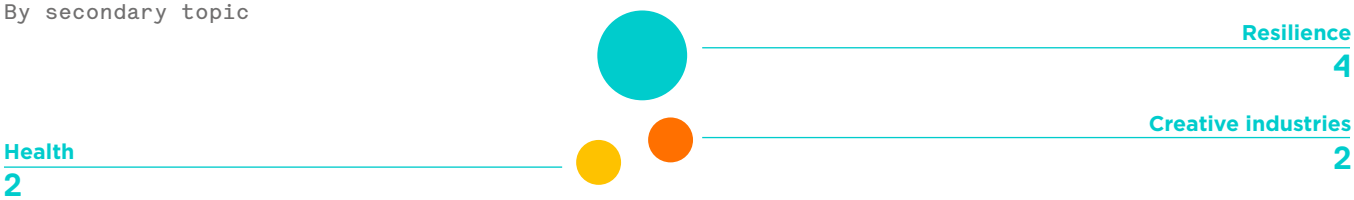
Number of innovations

By topic



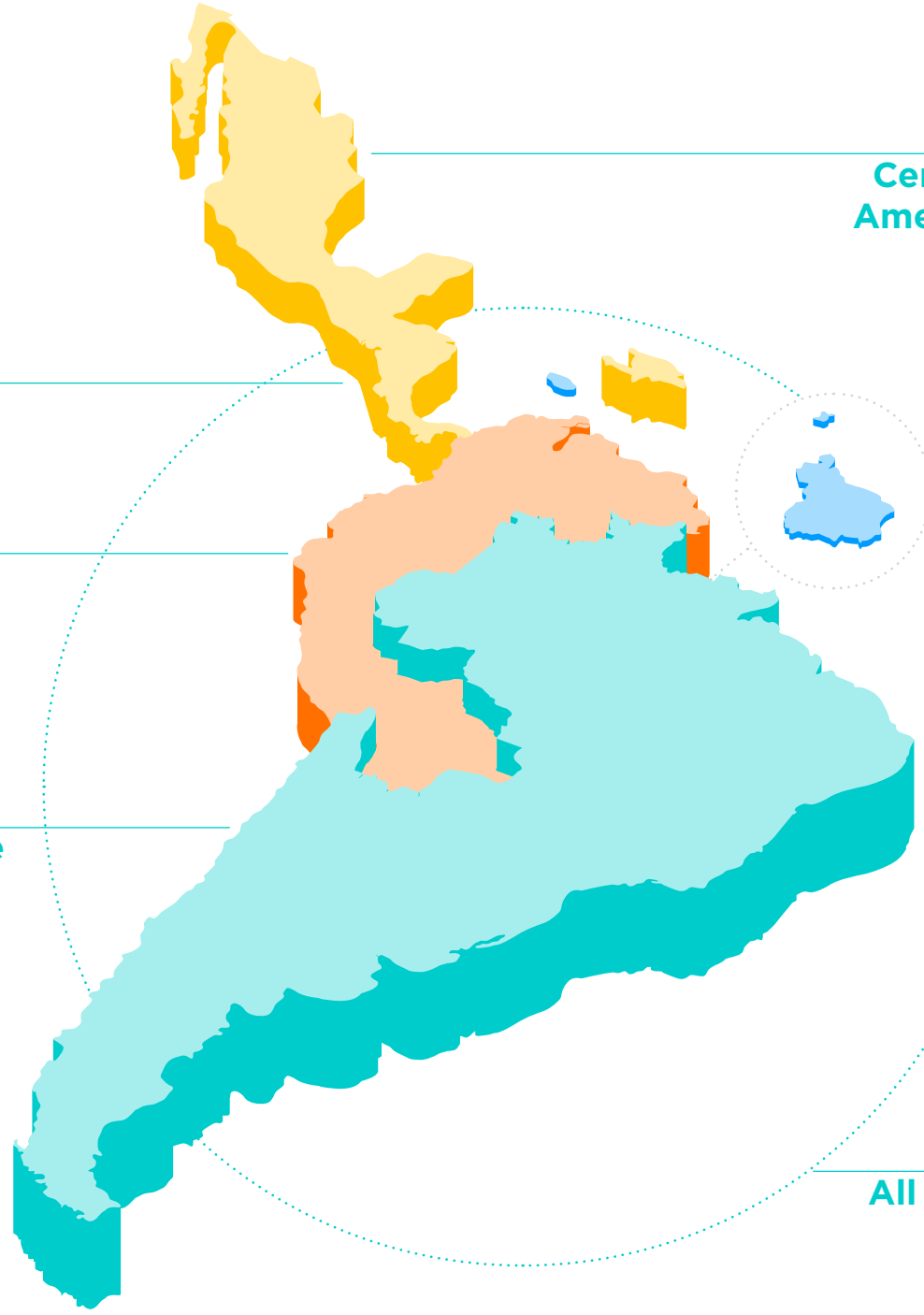
Number of innovations

By secondary topic



Number of innovations

By region



12
Central America

1
Caribbean

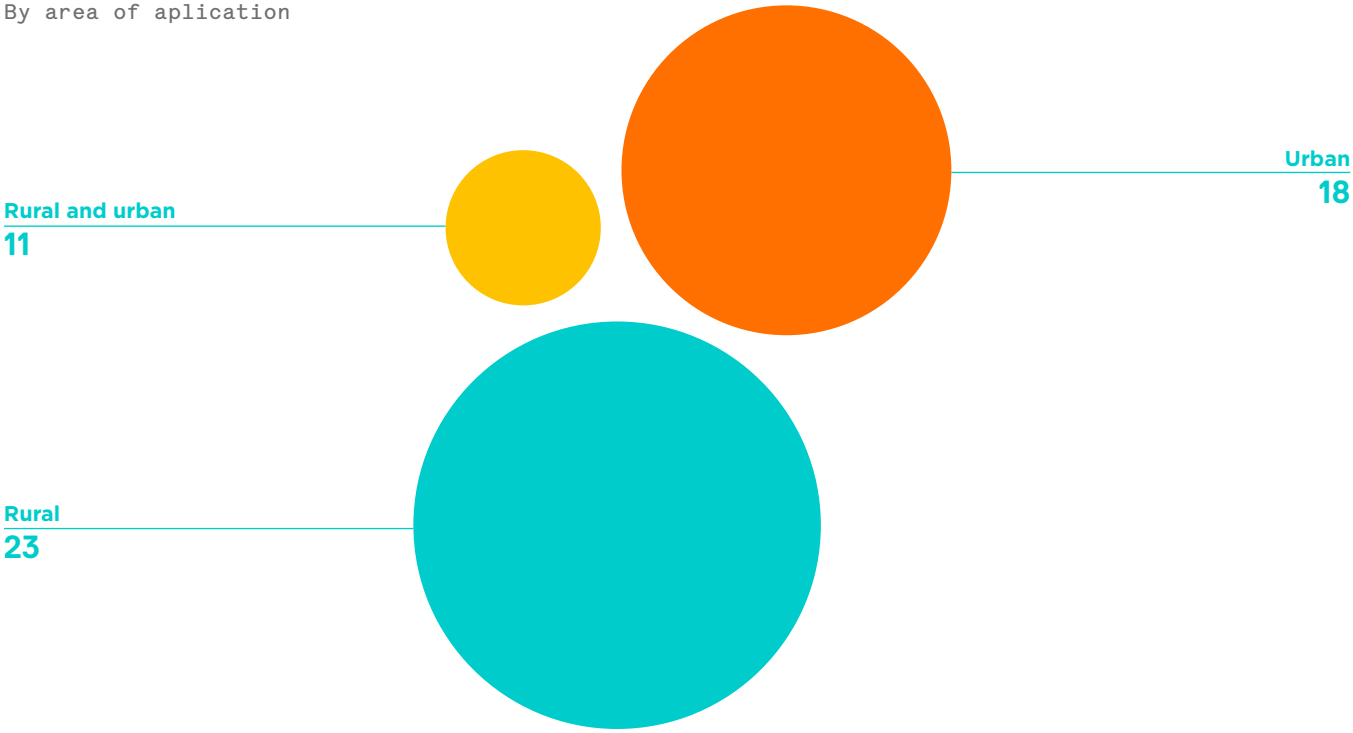
16
Andean Group

22
Southern Cone

1
All LAC

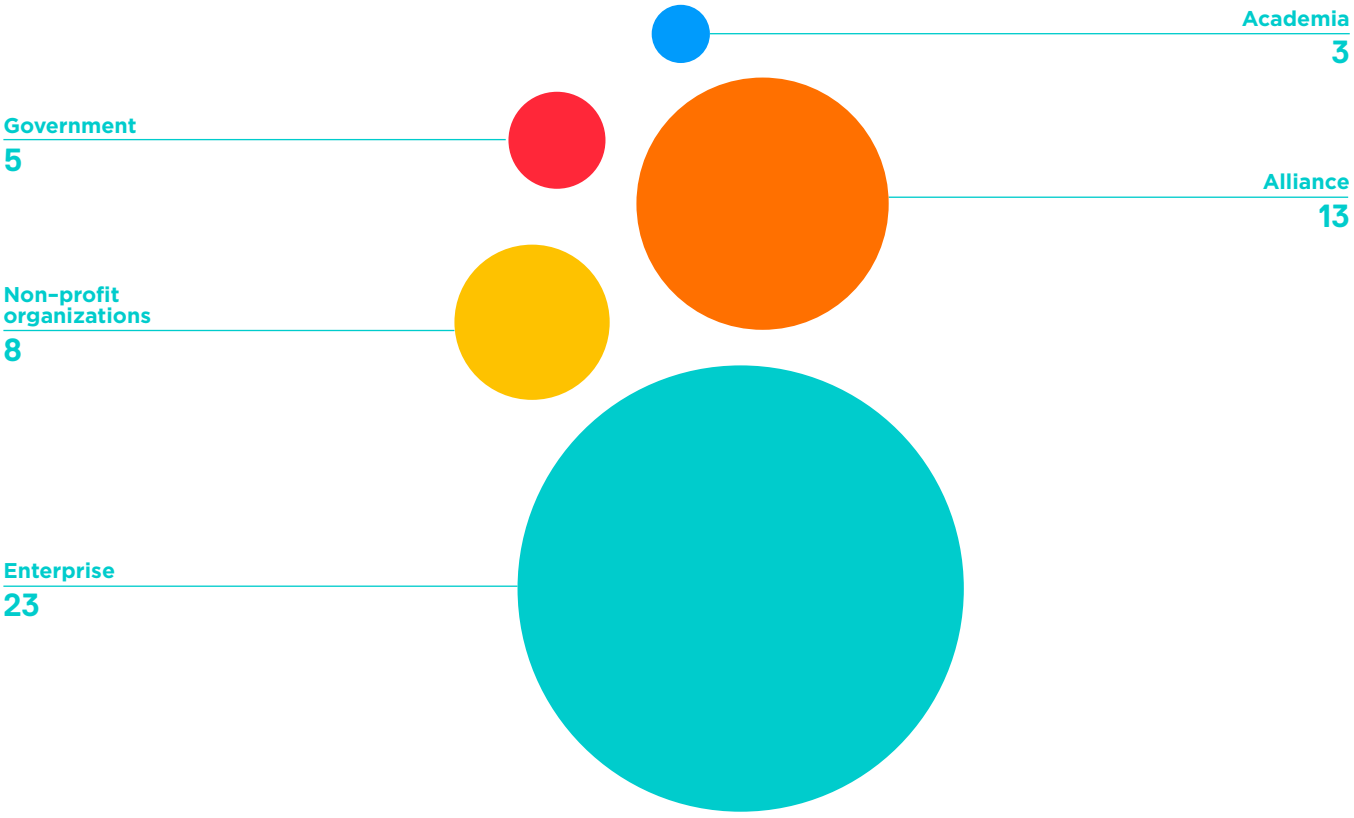
Number of innovations

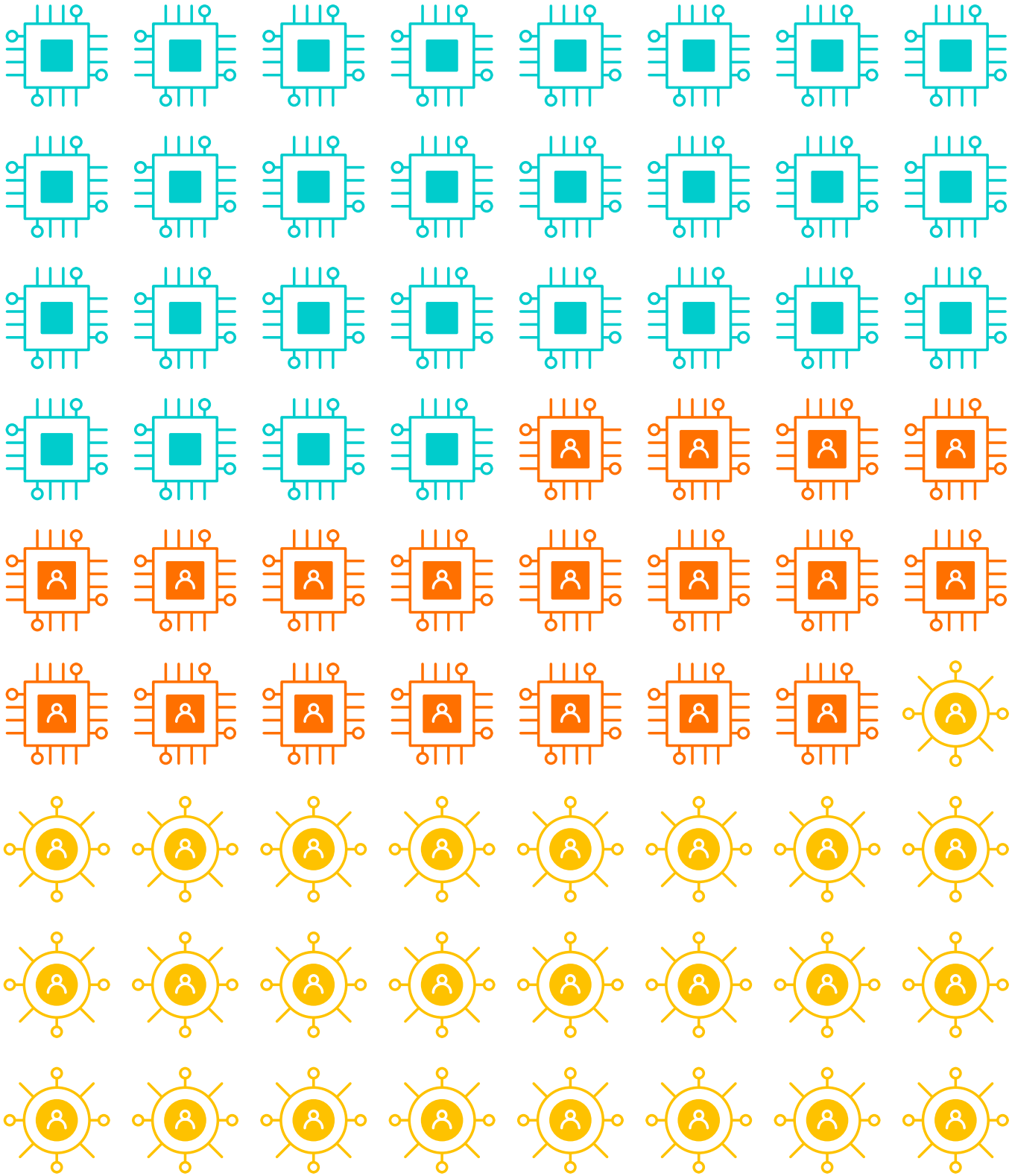
By area of aplication



Number of innovations

By type of organization





42%

Of innovations are thechnological,

27% are social-organizational
31% are technological and socio-organizational

Overview of the 52 analyzed innovations

By country

11 BRAZIL

4 NICARAGUA

5 PERU

2 COSTA RICA

2 ARGENTINA

5 MEXICO

2 URUGUAY

2 EQUADOR

5 COLOMBIA

2 BOLIVIA

1 HAITI

1 JAMAICA

1 PANAMA

1 VENEZUELA

7 CHILE

Selection criteria for the top 20 innovations

Once a database was set up with information about the 52 innovations, a ranking was established to evaluate their innovative merit and social impact based on the number of beneficiaries reached, impact on gender equality, social equality and scalability. The top 20 innovations in the ranking were selected to cover at least each of the 27 defined categories once.

Selecting the most innovative and relevant 20 cases

The 20 best ranked innovations were selected to cover most of the defined categories. Special attention was paid to having at least one case from each region in LAC.

Innovative merits

This refers to the degree of novelty and originality of the solution or proposal for the corresponding rural area, urban center, country, or region. Innovations can be of different kinds (ANII, n.d.):

Innovative product: the introduction of new products or services to the market or public, or existing products/services significantly improved or with relevant new benefits

Innovative organization: the introduction of changes in the organizational or institutional structures and management, modifications in the organization and management of productive processes, incorporation of significantly modified organizational structures, or the implementation of new or substantially modified strategic orientations

Innovative commercialization: the adoption of new business models, introduction of new methods to trade or deliver new or existing products/services

Innovative process: the adoption of new or significantly improved production methods.

It is worth pointing out that this report uses a crosscutting classification of innovations compared to the previous approach. Technological innovations (based on new technologies or knowhow) that usually match product or process innovations, as well as social-organizational innovations usually encompass innovations in organization and commercialization.

Impact

Impact is evaluated following the following criteria

- Number of beneficiaries that gain access to water, sanitation, and hygiene thanks to the innovation (less than 1,000; between 1,000 and 10,000; between 10,000 and 100,000; between 100,000 and 1 M; over 1 M)
- Impact of the innovation on gender equality: the degree in which the innovation tends to reduce the gap between the opportunities men and women have of participation, control, or access to services linked to water, sanitation, and hygiene (high, middle, low, not applicable)
- Impact of the innovation on social equality: the degree in which the innovation helps people from different social and economic backgrounds get the same opportunities for participation, control, and access to services linked to water, sanitation, and hygiene (high, middle, low, not applicable)
- The innovation has scaled beyond its point of origin (to several countries, another country, within the country, not applicable)

Innovative merits

LAC has a high potential for innovation in W&S

Out of the 52 selected innovations, 40 qualified as having middle or high innovative merit (77%). Only one of the 20 selected innovations displays low innovative merit; however, it was selected for its high impact on the number of beneficiaries and social equality.

Criteria for the selection of the top 20 innovations: innovative merits, number of beneficiaries, gender equality, social equality and scaling. All 27 categories are covered by at least one innovation.

Number of innovations by country

Top 20 cases

4 BRAZIL
3 PERU
2 COLOMBIA
2 EQUADOR
2 MEXICO
2 CHILE
1 NICARAGUA
1 URUGUAY
1 JAMAICA
1 PANAMA
1 HAITI

Impact on the number of beneficiaries

Selected innovations reach millions of beneficiaries

UO the 52 selected initiatives, one has more than 40 million beneficiaries - the *Confederación Latinoamérica de Organizaciones Comunitarias de Servicios de Agua y Saneamiento* (CLOCSAS, Latin American Confederation of Community Organizations for Water and Sanitation Service), which brings together the community organizations for water and sanitation services (OCSAS) from 14 countries. There are over 80,000 OCSAS in LAC providing water and sanitation to more than 40 million Latin Americans, and they have the capacity to serve 18 million more. The association of OCSAS into CLOCSAS, formalized in 2017, is a powerful social innovation reaching the scale that is necessary to generate mechanisms of incidence and participation in spheres of political decision-making. At the same time, this alliance paves the way for finding innovative solutions to collective challenges based on shared experiences and knowhow transfer among OCSAS. This arrangement favors community appropriation as well as the sustainability of the implemented technological solutions. CLOCSAS is one of the few examples of transnational networks of community organizations that have attained such a scope. The other 51 selected innovations reach 8.8 million beneficiaries in Latin America and the Caribbean, and the top 20 benefit 2.4 million people.

Impact on gender equality

There are excellent examples of innovations that empower women and favor their social and professional development

16 % of the 52 selected innovations have between some impact and a strong impact on gender equality. At the same time, 25% of the top 20 innovations advance gender equality. Two of them are literally changing the lives of women of limited resources, highly impacting their social and professional insertion, empowering them by providing education and tools for their development.

Impact on social equality

Most of the selected innovations actively imply and promote ownership by populations with fewer resources

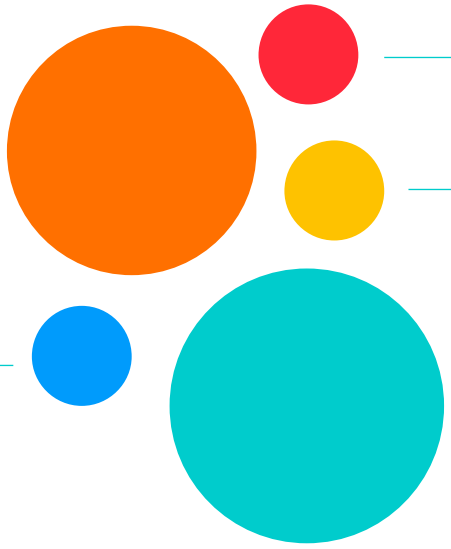
60 % of the innovations have between some impact and a strong impact on social equality on low-income populations. Only 255 of the top 20 innovations have no social impact; however, they have been selected for their innovative merits and ability to scale.

Overview of the 20 selected innovations by category

Criteria for the selection of the top 20 innovations: innovative merits, number of beneficiaries, gender equality, social equality ans scaling. All 27 categories are covered by at least one innovation.

Overview of the 52 identified and 20 selected innovations

By topic



Reuse
1

Waste
4

Hygiene
4

Water
11

Green infrastructure
4

Sanitation
10

Overview of the 52 identified and 20 selected innovations

By secondary topic

Creative industries
2

Resilience
2

Health
2

Overview of the 52 identified and 20 selected innovations

By region

Overview of the 52 identified and 20 selected innovations

By type of innovation

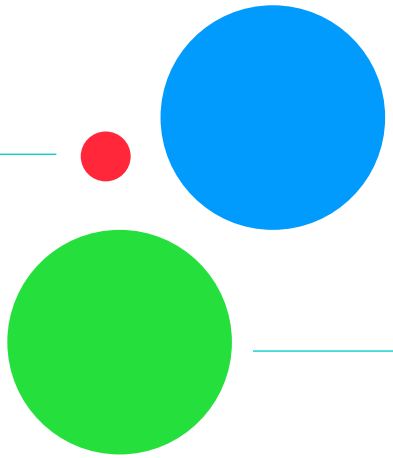
Social-organizational
7

Technological
5

Technological and social-organizational
8

Overview of the 52 identified and 20 selected innovations

By level of maturity



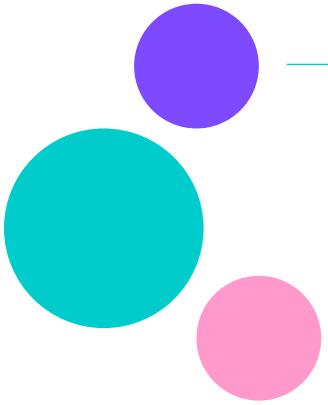
Emerging
2

Consolidated
9

Semi-consolidted
9

Overview of the 52 identified and 20 selected innovations

By area of application



Urban
8

Rural
4

Rural and urban
8

Overview of the 52 identified and 20 selected innovations

By type of organization

Enterprise
9

Alliance
4

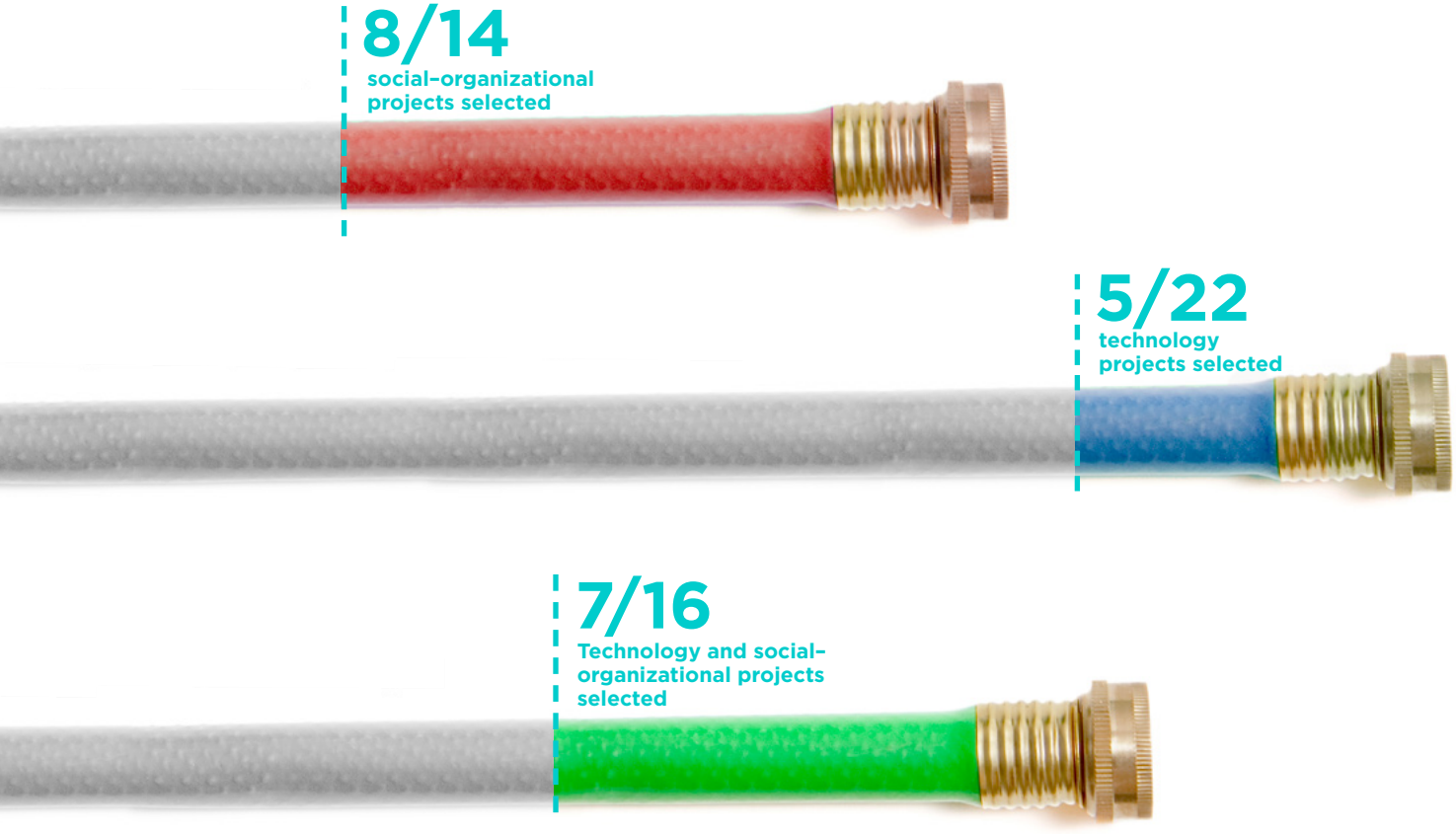
Government
3

Non-profit organizations
3

Academia
1

Overview of the selected 52 and top 20 innovations by type

The combination of social-organizational innovation with technological innovation is the most powerful combination, resulting in higher impact and scaling.

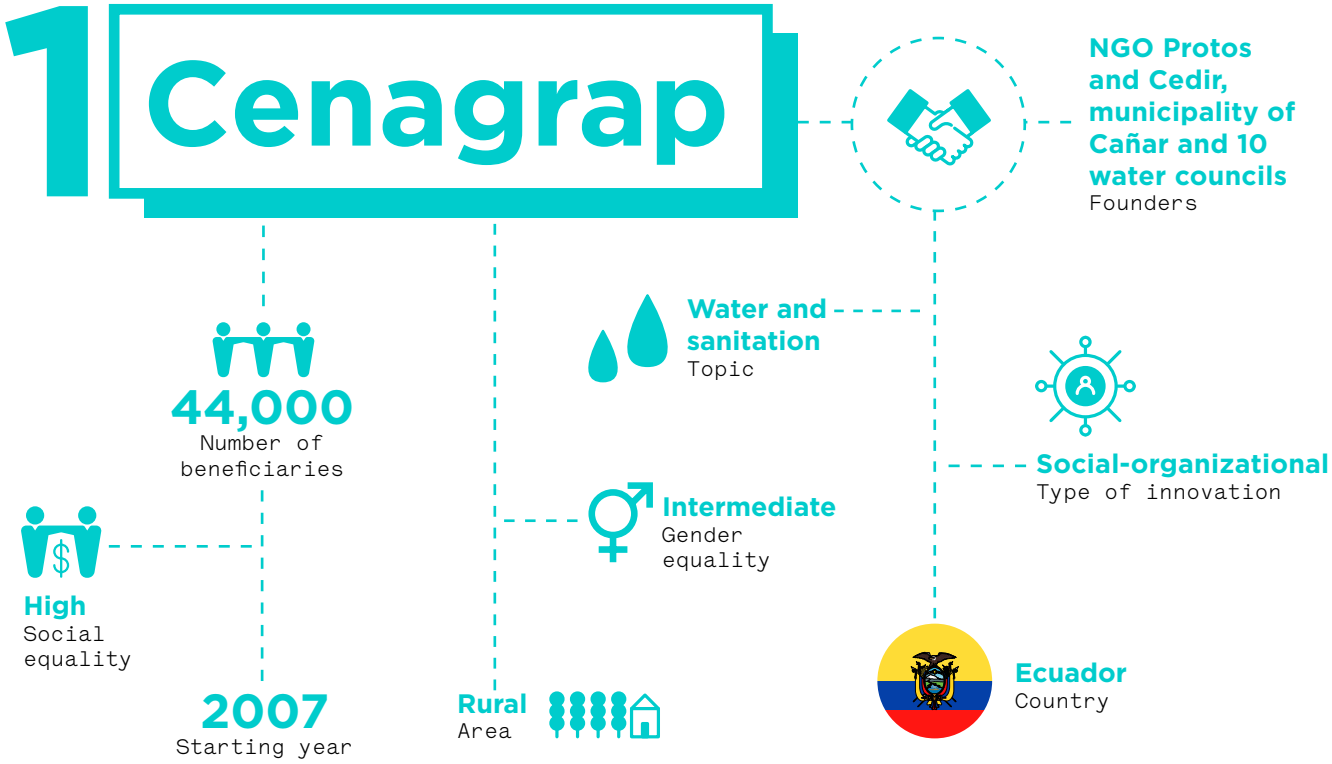


Technological & Social-organizational innovations represent 31% of the selected innovations, ascending to 40% of the top 20 innovations.

Twenty innovations you didn’t know were from Latin America and the Caribbean

The top 20 innovations are presented following the criterion detailed in Part 2. The first 15 are consolidated and semi-consolidated innovations that have reached results and achieved verifiable impacts such as the number of people who gain access to water and sanitation services and improvements in gender and social equality, while some of them have managed to expand within and beyond their countries of origin.

Water and sanitation



Alliance. The Centro de Apoyo a la Gestión Rural de Agua Potable (Cenagrap, Support Center for the Rural Management of Drinking Water) is the first public-community partnership in Ecuador to link the decentralized municipal autonomous government (DAG) with 120 water councils, for the management of rural water and sanitation services where both parties play their role for its operation and service delivery
Type of organization

Highlights

Cenagrap is an autonomous, self-managed community system that presents excellent results and sustainability. In late 2017 it was recognized by the VIII Latin American Water Community Management Meeting as an inspirational model of dialogue and public-community alliances.

Besides providing water access to 44,000 Ecuadorans, it has achieved several other goals, such as boosting the systems' lifespan and quality of service, controlling water quality, and generating information for decision making.

Brief description

The Support Center for the Rural Management of Drinking Water (Cenagrap) is a public-community partnership from the Cañar district -one of the poorest in Ecuador- that brings together the district's municipality and 120 rural drinking water management councils

(JAAPs). This agency seeks to uphold JAAPs sustainability by providing technical support and integrated management services for drinking water and sanitation in rural areas.

In Cañar, the public-community partnership responds to the needs of disadvantaged rural sectors while including representatives from every area of the district in Cenagrap's board. This way, the center ensures water and sanitation services to populations with typical rural features (low density, dispersion, difficult access, and/or high unit costs). In some of these areas, partnering is the only viable model. By joining forces, municipalities and community systems can enhance their coverage scope and boost their efficiency. In recent years, Cenagrap has managed to:

1. Create a local public-community partnership governance model that links the municipal decentralized autonomous government (DAG) with 120 water councils in order to manage the rural water and sanitation services in such a way that both sectors contribute to their operation and the services they provide.
2. Extend system lifespan and service quality, leading to major savings for the municipal DAG. There are many systems throughout the country that must halt production after only a few years due to lack of resources or technical capacity.
3. Monitor water quality -one of the worst problems in the country's systems- through a private lab that carries out two or three water quality control campaigns in the councils. The results are used to take the necessary corrective actions.
4. Produce information for decision-making - another flaw in the country and region which is beginning to see a solution: Cenagrap possesses information from both the state and councils on several topics (administrative-financial, technical, fees, state of the systems, among others), which enables a better management of the rural water and sanitation sector in the Cañar district.

Innovative merits

Cenagrap is a successful social and organizational innovation based on a novel link between the community and the municipal government that has been very hard to replicate, hence its originality. It has succeeded at getting community systems to provide quality water -sufficiently, continuously, efficiently, and sustainably–, improving rural communities' health in the Cañar district. The articulation between government and community is reflected in the administrative council of Cenagrap, comprising the mayor, two district council members, and three JAAP members, as well as delegates from the low-, mid- and uplands. While articulation between the state and communities is hard to come by in Latin America, this flagship initiative is worth trying to replicate in other countries and communities.

www.canar.gob.ec

“Cenagrap is a benchmark example of public-community collaboration that generates social awareness on the use of clean water and conservation of water resources focusing on respect for interculturality, collective work, and transparency in dealing with users and consumers”

2 Lancones Project

Jorge Viera Sernaqué and Enrique García
Founders

Social-organizational
Type of innovation

Intermediate
Gender equality

2007
Starting year

Low
Social equality

1,500
Number of beneficiaries

Water, sanitation, and hygiene
Topic

Rural
Area

Alliance. The Asociacion Fomento de Investigacion y Accion para el Desarrollo (FIAD, Association for the Advancement of Research and Action for Development), in close partnership with the University of Piura, the organized population and its respective local, provincial, and regional governments foster the development of local residents through a variety of safe water and sanitation projects.
Type of organization

Peru
Country

Highlights

In Piura, water supply is limited by the availability of compatible energy sources and the geographic, social, cultural, and economic conditions of lower-income areas. These factors are not always taken into consideration in government policy for rural areas such as those in the Lancones district.

This project seeks to promote dwellings' development and attain self-sustainability by training locals in the proper care and administration of water supply systems, electrification, and local natural resources.

Brief description

The rural, scattered nature of communities like Lancones makes it hard to provide them with water, sanitation, hygiene, and education services. However, significant progress has been made thanks to the joint effort of the population, the municipality, the University of Piura, and the FIAD.

Proyecto Lancones implements drinking water and sanitation systems (powered by solar energy), making an efficient use of the natural resources available in the border area between Peru and Ecuador. The population participates actively in its development and maintenance, which requires previous training by the FIAD. This user involvement in the operation and upkeep of the water and sanitation services has been a key factor for its sustainability.

Innovative merits

This is a social innovation. The novel and replicable aspects of the practice lie in its participative nature, reliance on clean technologies, and generation of sustainable capacities. Water systems use solar energy during construction, and latrines with local design and materials are built in accordance with the dry forest ecosystem. These simple to use and maintain systems are managed by locals trained in organization, management, construction techniques, and in sanitary, civil, and environmental education. This constitutes an excellent example of developing local capacities to achieve sustainable strategies to gain access to safe water and sanitation in rural areas with low population density.

fiad.org.pe/

“Proyecto Lancones implements (solar-powered) drinking water and sanitation systems, making an efficient use of the natural resources available in the border area between Peru and Ecuador while seeking to educate the population to ensure their sustainability”

3 Agualimpia

Peru
Country

Mercedes Castro
Founder

Does not apply
Gender equality

Social-organizational
Type of innovation

Does not apply
Social equality

Urban / Rural
Area

Water and sanitation
Topic

170,000
Number of beneficiaries

2007
Starting year

NGO. Agualimpia is a non-profit, non-governmental organization that has been coordinating local and regional governments, the private sector, and communities since 2007 to implement self-sustained clean water and sanitation systems in vulnerable areas.
Type of organization

Highlights

Before Agualimpia was implemented, many communities had no financial possibilities to gain access to sanitation networks, infrastructure or safe water. To help relieve this, Agualimpia has worked alongside Peruvian microcredit institutions (MFIs)[1] with whom they developed a financial product for sanitation inclusion as a part of their global service portfolio to foster safe water and sanitation access for households seeking to improve their conditions but unable to do so without financial support. Agualimpia also developed financial products for water and sanitation in partnership with the MFIs, including support for marketing strategies to help connect potential clients with MFIs, and establishing sustainable financial products that are affordable to low-income communities.

1 Also known as *microfinance institutions* hence the initialism MFIs.

Mérito inovador

The Agualimpia program has been recognized by the Inter-American Development Bank (IDB) as one of Latin America's pioneers in developing adequate and sustainable financial markets in water and sanitation through microcredits, as well as innovative strategies so that low-income households can gain access to safe water and sanitation.

The program has been a success, and can serve as a model for replication due to its innovative business model: partnering with experienced microcredit institutions, it creates new economic and financial mechanisms previously unavailable to vulnerable and low-income segments of the population, offering reasonable products, well-suited to the sector's needs and with adequate distribution channels.

Main accomplishments

Agualimpia has developed projects funded by the Multilateral Investment Fund (MIF) of the IDB Group, the Swiss Agency for Development and Cooperation (SDC), the European Union, and the World Bank, as well as civil society organizations such as Avina Americas, Avina Foundation, SODIS, The Resource Fundation, Ariel Foundation, Asociacion Civil Neoandina (Neo-Andean Civil Association), Asociacion Cerro Verde, and private sector companies like Scotiabank, Minera Barrick Misquichilca, Yanacocha, Southern Copper, Mantaro Peru, and Coca-Cola.

www.agualimpia.org / www.crediagua.com

“Access to clean water and sanitation through microfinancing in Peru with cooperation from the private sector to help bridge the gap towards SDGs”

4 Plano Morar Carioca

Municipality of Rio de Janeiro
Founders

Does not apply
Gender equality

Social-organizational
Type of innovation

Urban
Area

1,000,000
Number of beneficiaries

High
Social equality

Water, sanitation and waste
Topic

Brazil
Country

2004
Starting year

Government. Municipal Secretariat of Urbanism, Infrastructure, and Housing of the Rio de Janeiro Municipality.
Type of organization

Highlights

The Morar Carioca Program -also known as Municipal Plan for the Integration of Informal Settlements- seeks to pacify and integrate the favelas with formal adjacent communities through a process that includes fighting drug gangs, ridding favelas of weapons, and providing them with public services such as water, sanitation, waste management, and electricity with a view of formalizing all of the community's activities.

This requires strategic planning and close coordination between the municipal and state governments, with the participation of numerous police units in each of the phases, as well as health agents, and a variety of local organizations.

Brief description

There are more than a thousand favelas or informal settlements in Rio de Janeiro, which are home to more than one-third of the 6.3 million city dwellers (IBGE 2013). For more than 25 years, the predominance of gangs has affected livelihoods, access to services, social capital, and perceptions outsiders have of favela residents, which reduces their opportunities for social and spatial mobility (Perlman, 2010).

Morar Carioca is a strategic initiative of the Municipality of RJ that encompasses the appeasement, urbanization, and social reinsertion of favela residents. It is a long process, requiring many years. It starts with the BOPE (Special Operations Police Battalion) taking control of the favelas back from the drug gangs and clearing them of weapons. Next follows a stabilization phase by the UPPs (Peacekeeping Police Units). Finally, the Social UPP steps in, implementing and formalizing the supply of services such as electricity, water, sanitation, and solid waste management, as well as all activities in the favelas.

Innovative merits

Recuperating the favelas and other gang-controlled Rio settlements, their pacification, and their insertion in nearby formal communities and in society at large have always been a challenge for the government. There have been several attempts before, but those initiatives never passed the initial stages of recuperation and appeasing and eventually slipped back to the old state of affairs.

The key to the plan Morar Carioca success lies in good planning to meet long-term goals, and in collaboration among municipal and state governments, police units, civil defense, and other community players. Its main features include assigning specific tasks to different police units at each stage, focusing on studying the specific needs of each favela, and the pursuit of appropriate, progressive, and effective mechanisms to formalize the services.

It is a very original social, organizational and procedural innovation in Brazil and in Latin America, transforming organizational processes and articulating diverse stakeholders with a specific focus and robust long-term vision in a way rarely seen in the region. It provides safe access to water, sanitation, and solid waste handling to extremely poor and neglected segments of the population and represents a sustainable alternative to improve the lives of settlement dwellers throughout Latin America.

www.medium.com/morar-carioca

“The Morar Carioca Program seeks to pacify and integrate Rio de Janeiro’s favelas through a process that includes fighting drug dealing and providing basic community services”

Water

5 Mesita Azul

22,000
Number of beneficiaries

Technological and social-organizational
Type of innovation

Inter-mediate
Social equality

Urban / Rural
Area

Intermediate
Gender equality

Water
Topic

2010
Starting year

Mexico
Country

Ian Balam García and Fermín Reygadas
Founders

NGO. Fundacion Cantaro Azul operates in several states in Mexico, with headquarters in the southeastern region. Its current programs are: NuestrAgua- Redes Comunitarias, NuestrAgua-Franquicia Social, and Agua Segura en Escuelas.
Type of organization

Highlights

Mesita Azul is one of the few technologies that was designed with direct participation of marginalized communities, especially women. It emphasizes esthetic elements and simplicity.

Due to its success in households, schools and community kiosks, Mesita Azul has enhanced its capacity to offer effective, sustainable solutions on water for human consumption.

Brief description

Mesita Azul is an innovative water disinfection system using ultraviolet light designed and developed by Cantaro Azul in collaboration with the University of California at Berkeley. Mesita Azul inactivates bacteria, viruses, and protozoans with a flow capacity of 5 liters per minute without affecting the physical-chemical properties of water (such as flavor and temperature.)

Mesita Azul emits a high dosage of germicide that meets the criteria of highly effective disinfection as established by the World Health Organization (WHO): such margin of safety guarantees the system's effectiveness even when operated in non-ideal conditions. Tests conducted by the Mexican Institute of Water Technology confirm that Mesita Azul meets the Secretariat of Health standards for disinfection systems at the point of use.

It was designed in cooperation with rural communities to ensure their adoption. The design and use take into consideration gender policies.

Innovative merits

The innovative aspects of Mesita Azul lie on being a product that has scaled to a high degree of technological complexity, adapted to community environments, and that was designed and developed in collaboration with rural communities. The ability to create alliances for innovation, such as the association with the University of Berkeley -world leader in innovative solutions for clean water– should also be noted. The innovation contains elements of community ownership, behavioral change, and co-creation with communities. It constitutes a clear example of the concepts of open innovation, developed originally by Henry Chesbrough from UC Berkeley, in his influential book *Open Innovation: The New Imperative for Creating and Profiting from Technology* -first published in 2003.

Lastly, the solution contemplates a sustainable model of operation and maintenance.

en.cantaroazul.org

“Cantaro Azul develops technological, social, institutional, and financial innovations to change the sector’s paradigm and scale up sustainable water and sanitation services in rural communities in Mexico”

6 Isla Urbana

Carmen Hernández, David Vargas, Enrique Lomnitz, Hiram García, Jennifer White and Renata Fenton
Founders

2010
Starting year

Does not apply
Social equality

Does not apply
Gender equality

Urban / Rural
Area

Social-organizational
Type of innovation

Water and Green infrastructure
Topic

Mexico
Country

45,500
Number of beneficiaries

Enterprise. This social innovation company was founded in 2010 in collaboration with the International Institute of Renewable Resources in Cultura Maya, a popular settlement in the southern area of Mexico City affected by severe water shortages. With an environmental and social angle, they learn to collect rainwater in the most practical possible manner.
Type of organization

Highlights

Since it was founded in 2010, Isla Urbana has installed 6,500 rainwater collection systems benefiting 45,500 people, and harvesting 590 million liters of water, the equivalent to 59,000 water pipes. Mexico City is categorized as the third most water-stressed city in the world because it extracts much more water from aquifers and rivers than goes back into refilling them. To tackle this problem, the organization wants to adapt the city's buildings and rooftops to collect water, thereby reducing groundwater extraction during the rainy season and giving aquifers a respite.

Brief description

Isla Urbana is a project that contributes to Mexico's sustainability through the collection of rainwater.

"Rainwater harvesting allows us to reduce the amount of water we need to extract, slowing down and perhaps eventually even halting the city's subsidence," the organization's website says. Over 10 million Mexicans lack water services: in Mexico City alone, about 250,000 people live with no connection to the water network and millions more suffer an intermittent service or receive contaminated water.

Isla Urbana's goal is to create rainwater-harvesting systems to cover the water needs of a family during 5 to 12 months a year. With the appropriate approach, collected rainwater could be used for human consumption. Every rainy season, Mexico City suffers serious damage brought about by floods caused by the saturation of the drainage systems. What Isla Urbana pursues is to collect this rainwater and fill millions of cisterns avoiding their pollution. Besides water scarcity, the city spends a lot on energy to pump the water. Thirty percent the network's water originates in the Lerma-Cutzamala basin outside the valley. After being pumped, it must travel 150 km, including 1 km vertically. The amount of energy this requires is similar to the total consumption of the city of Puebla. In areas like Iztapalapa, where supply is less efficient, hundreds of pipes fill tanks and cisterns every day. Harvesting rainwater in these areas is needed to reduce reliance on pipes and provide economic relief to hundreds of thousands of families.

Innovative merits

The Isla Urbana project relies on an innovative business model, achieving a huge impact with a simple, powerful, complete product as well as a very efficient distribution and maintenance network. Although rainwater collection for drinking and storage purposes is a very old method, it is not frequent to scale the solution to reach urban and rural environments. To do so, it was necessary to innovate in the business and organization models.

In this sense, the *whole product solution* concept is quite useful, particularly for innovation management. The term was coined by Geoffrey Moore in his book *Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers* from 1991 with revisions in 1999 and 2014, a true guide to understanding successful innovation cycles. A *whole product solution* is necessary to scale up an innovation. In other words, the innovation not only has a functioning *core* product that works very well but also every other element the end user needs (considering a conservative client and not *early adopters*) to quickly adopt the technology. In this case, Isla Urbana has managed to commercialize a complete product solution by offering every necessary element (e.g. many types of pipes, valves, tanks, distribution network, accurate capacity calculation, among others) so the client can activate the system almost on a plug and play basis.

www.islaurbana.org

“Isla Urbana develops tools for autonomous sustainable water access for Mexico’s marginalized communities through the collection, storage, and purification of rainwater”

7 Ekofil

2008
Starting year

Low
Social equality

Does not apply
Gender equality

Water
Topic

Rural
Area

Technological
Type of innovation

Javier Moreno Gómez
Founders

70,000
Number of beneficiaries

Colombia
Country

Enterprise. REPLACOL —producer and distributor of EKOFIL— began as a small company in Cali, Colombia initially producing reprocessed plastic containers and modules for the organized collection of solid waste. Shortly after, as part of the Latin American Sanitation Conference LATINOSAN 2007 held in Cali, it started to produce EKOFIL.
Type of organization

Highlights

This project was led by Javier Moreno G., a chemical engineer from the Universidad del Valle with specialized studies in Sanitation and Environmental Engineering, with the help of a proactive team of technicians and operators. It has currently served 15,000 families in rural areas in Colombia in over 25 municipalities.

The project was installed with the support of: UNICEF programs for indigenous communities in the area of the river San Jorge - Tierra Alta, Cordoba; the Swiss Agency for Development and Cooperation (SDC) with Nestlé Colombia within the framework of the Agua

Viva program for rural school communities in Caqueta; Corona Foundation and UNICEF for the indigenous school population in the rural area of Cauca; and the Social Pastoral of the Guapi Vicariate with Diakonie Katastrophenhilfe for the Municipality of Guapi, among others.

Brief description

It's a practical, portable water filter that is easy to install and handle. It requires no electricity or any special substances for recharging. EKOFIL is made from porous clay treated with a special coat of colloidal silver and works by the action of gravity, generating clean water from untreated water available in puddles, rivers, cisterns, lagoons, and other similar sources.

Quick facts:

1. It carries its own pulverization, sieving, mixing, and pressing equipment for operations that allow mechanization; plus, a local plant has been built with local technology to manufacture the filter's plastic components.
2. Manufacturing the filter is labor intensive due to the amount of manual labor involved, i.e. collecting clay, sieving, polishing, air drying , baking, evaluating filtration rates individually, applying silver, final drying, last revision, and packaging, among others.
3. A support network has been created for transportation logistics, which has allowed the filter to reach remote areas in Colombia via land, air, sea, rivers, and/or the use of animal traction.
4. Links to prestigious local labs and highly qualified professionals have been established to perform the pertaining microbiological analyses.

Innovative merits

EKOFIL was able to adapt an idea used in the first world to rural Latin American contexts with great success, while generating knowledge and promoting local manufacturing. This is an example of an incremental innovation in a product, with excellent product development and adapted to rural conditions. This type of innovation is very relevant in Latin America, where often the problem is trying to import turn-key solutions that cannot be adapted locally, which leads to their failure during the operation and maintenance phases.

This innovation constitutes an excellent example of the local adoption of a technological innovation with the right contextualization, local production, and reliance on local expertise in Latin America. The company has expanded its market share thanks to the great quality, scalability, and easy maintenance of its product.

It has been selected among the finalists of the 2017 IDB-FEMSA Awards.

www.filtroekofil.com

“EKOFIL filters are a simple and powerful resource for the most vulnerable communities to access sufficient safe water in a simple manner anytime anywhere, promoting health and improving lives”

8 Alerta Rio

Cesar Maia, Moysés Vibranovsky e Ricardo Neiva d'Orsi
Founders

Does not apply
Gender equality

High
Social equality

100,000
Number of beneficiaries

Technological and Social-organizational
Type of innovation

Water
Topic

2010
Starting year

Brazil
Country

Urban
Area

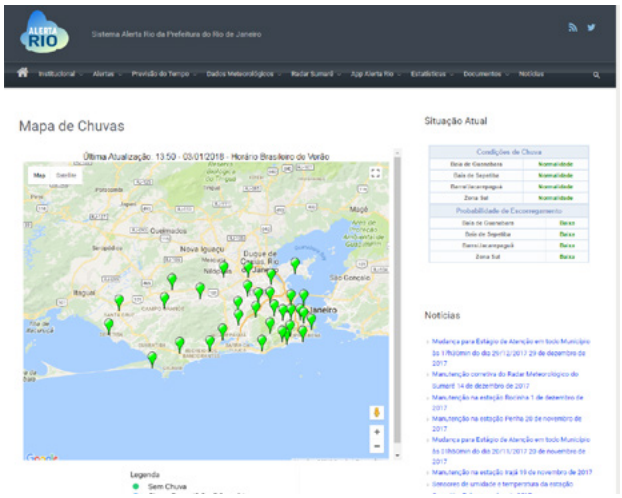
Government. Alerta Rio is an alert system for landslides caused by strong rains, created by the Rio de Janeiro Municipality.
Type of organization

Highlights

Landslides are the most common problem in the hills of Rio de Janeiro lashed by heavy rains. Rio's early flood warning system is particularly effective and has excellent interinstitutional coordination.

The Operations Center in Rio de Janeiro (COR, from its Portuguese initials) is the first center of intelligent cities in the world, integrating every stage of crisis management: from anticipation, mitigation, and preparation to the immediate response to events and system feedback with new information for future cases.

Rio de Janeiro has been appointed best smart city at the Smart City Expo World Congress 2013.



Brief description

Landslides are a major problem when heavy rains hit Rio de Janeiro's hills, causing a heavy toll, with many dead and wounded.

Although there have been successful experiences thanks to early flood warning systems in large urban areas in Latin America, Rio's system stands out for its effectiveness and interinstitutional coordination. Establishing an operations center that provides real-time integrated data from 30 agencies has led to excellent coordination and timely responses, as well as efficient citizen feedback.

The creation of Community Civil Defense Centers (links between the community, health agents, municipal community programs, and civil defense in general) was also crucial. Actions such as the training of community agents and leaders, the high number of drills, the presence of civil defense in various forms in the community before, during, and after the disaster reinforce community mobilization, which constitutes a success factor for Rio de Janeiro's early warning system.

Innovative merits

The early warning system for floods is a regional example of how combining innovative technologies and the proper social-organizational practices can lead to high-impact innovations. This warning system accomplishes -through the COR- the integrated administration of all crisis management stages. The innovative recipe comprises excellent data coordination -supplied by the Internet of Things in several sectors relevant to manage an early warning system and not only rain registries and forecasts—, its proper processing through advanced Big Data models, its cross-checking with multiple data sources, and an excellent ability to communicate with the population. All this has ultimately lent credibility to a service that is normally questioned in most capitals in Latin America and other regions.

alertario.rio.rj.gov.br

“Alerta Rio is an early rain-and-landslide alert system coordinated by Rio de Janeiro’s Center of Operations – the first center of intelligent cities in the world; its effective rainfall network and meteorological radar make possible the prevention of natural disasters”

Sanitation

9 X-runner

Urban / Rural
Area

4,000
Number of beneficiaries

Low
Gender equality

Technological and Social-organizational
Type of innovation

High
Social equality

2012
Starting year

Isabel Medem and Jessica Altenburger
Founders

Sanitation
Topic

Peru
Country

Enterprise. X-runner is a social innovation company founded by women, which has quickly scaled and become a new model for the provision of sanitation services following a successful socially innovative model.
Type of organization

Brief description

This social innovation company offers affordable dry toilets that users can install anywhere in their houses. The toilets separate urine from feces; the latter drop into a separate container where the client pours a handful of sawdust to dehydrate the excrement preventing stench, insects (such as flies and roaches), and diseases. For a monthly fee, the waste is picked up on a weekly basis.

Feces are recycled into high-quality organic compost used for soil enrichment. The collection service is a key element of the enterprise. Every week, clients can exchange their bucket full of excreta for a new biodegradable bag and sawdust from a collection truck. At that point, information and feedback on

the service and product are collected from users. It is also an opportunity to solve problems that might have occurred. The closeness with clients guarantees a high-level service and the development of new products and services adapted to their needs.

X-runner has set up an alliance with Separett -one of the manufacturers of toilets that sort urine from feces. Their products are designed to satisfy clients' demands on environmental impact, functionality, and quality. Clients receive the Separett's Villa model, an esthetically designed functional toilet that is comfortable and easy to use.

Innovative merits

X-runner presents an innovative business model. The company supports sustainable sanitation markets and applies reuse. Founded by women, it constitutes an example of dynamic market creation that generates jobs, provides access to safe sanitation, and develops a market in which users and suppliers generate a virtuous ecosystem of mutual benefit and synergy.

Every unit supplied is equipped with an NFC label with the user's code. The data is gathered and processed combining the use of Salesforce.com and ODK systems on mobile phones to simplify access to the information and ensure a high level of efficiency.

To pay for the service, users rely on an innovative system that brings together banking agents (kiosks and small shops connected to banks), thereby inserting users into the banking system.

Another very important aspect is the fact that the systems' maintenance is guaranteed from day one and is naturally integrated into the business model, as is the logistics of the social venture.

It truly is an example of social innovation with an innovative high-impact business model to bridge the gap to access safe sanitation, and has been held up as a model by the IDB.

Main accomplishments

X-runner is the first Peruvian company to be certified as a B corporation.

All B corporations measure their social and environmental impact while personally, institutionally, and legally assuming a commitment to make decisions that consider the long-term effects of their actions both on the community and the environment. They responsibly decide to partake of this global movement of companies that seek to make a change while relying on market power to provide solutions to social and environmental issues.

www.xrunner-venture.org

“X-runner offers sustainable alternative sanitation solutions and has benefited over 4,000 low-income inhabitants of Lima to date”

10 Soil

Sasha Kramer
Founder

High
Social equality

Sanitation
Topic

6,000
Number of beneficiaries

2014
Starting year

Technological and Social-organizational
Type of innovation

Low
Gender equality

Haiti
Country

Urban / Rural
Area

Enterprise. SOIL (Sustainable Organic Integrated Livelihoods) is a company that develops social innovation models for ecological sanitation –a process through which the nutrients in human excreta are returned to the soil rather than allowed to contaminate natural water resources.
Type of organization

Highlights

SOIL relies on a philosophy called Liberation Ecology influenced by the liberation theology movement and ecologic theory, which considers that the most vulnerable human beings tend to live in the most environmentally challenged places. SOIL aims at empowering marginalized populations, equipping them with tools that restore natural ecosystems.

Brief description

SOIL works to transform Haiti's conditions with short- and long-term projects that seek to solve the country's social problems. It extends access to safe sanitation by developing social innovations, offering design and implementation solutions, and promoting sanitation models that grant access to vulnerable communities.

With EkoLakay -SOIL's bathroom pilot- clients pay a small monthly fee to acquire a toilet specially designed for their house for which SOIL offers a weekly maintenance service; this includes picking up containers full of waste and replacing them with empty sanitized ones.

SOIL supplies EcoSan with toilets and excreta treatment services for community events, construction sites, and other activities around Haiti.

Innovative merits

This is an excellent example of a social-organizational innovation and business model to provide access to safe sanitation in Haiti within a critical context. It has been highlighted by the IDB.

Emphasis is placed on the creation of jobs around the open innovation ecosystem, the reuse of sanitation waste with quality controls and appropriate procedures, and the development of a sustainable model that has been working for at least the past five years in an environment as complex as Haiti.

www.oursoil.org

“SOIL develops commercial models with a social component for water sanitation in urban settlements quickly expanding in Haiti by transforming human excreta in fertilizers for agricultural use”

11 BioToth

Panama
Country

Urban
Area

Does not apply
Gender equality

Technological
Type of innovation

3,000
Number of beneficiaries

Does not apply
Social equality

2014
Starting year

Sanitation and Green infrastructure
Topic

Carla Laucevicius
Founder

Company. TOTH labs in Panama commercialize the invention BioToth. The firm was established as part of the Infrastructure and Equipment strengthening program in R+D of the National Secretariat of Science, Technology and Innovation (SENACYT).
Type of organization

Highlights

One of the major problems with wastewater treatment systems is the accumulation of grease and oil that may block sanitation ducts. In Panama, the recent fast population growth is making the problem worse. In this scenario, young Brazilian Carla Laucevicius has come up with a cocktail of bacteria capable of digesting wastewater grease and prevent its accumulation. The project's innovative potential has made its creator and founder one of the winners of Innovators Under 35 - Central America 2016 prizes awarded by the Spanish edition of the *MIT Technology Review*.

Brief description

Using bacteria to dissolve the accumulation of grease on water sanitation infrastructure is a popular practice. However, Laucevicius and her team have managed to improve it by identifying a specific microbiota from Panama. The country's endemic bacteria are capable of degrading the mix of oils and grease generated in the region that couldn't be degraded by any existing solution thus far.

"The first step was identifying which bacteria appeared naturally in oily accumulations in sanitation facilities in Panama," she explains. Once those microorganisms were isolated, she conducted a selective culture until a final mix capable of reducing the clot by 80% to 90% was achieved. This bacterial mix is known as BioToth and is commercialized by Toth labs, its founding company.

BioToth is inoculated in grease traps installed in restaurants, supermarkets, and residential areas to treat wastewater. This reduces the frequency with which these systems must be cleaned of accumulated grease, and therefore cuts costs. At the same time, it has entered the public sanitation system with very favorable results.

Innovative merits

This is an innovative product with a high technological component. It can compete successfully in the market and displace existing solutions, relying on a competitive advantage linked to applied scientific research. In this case, the innovative process completes a full cycle by developing a marketable product with very good distribution channels, as well as high-quality technical support.

It constitutes a prime example of technological innovation and entrepreneurship in Latin America. With a solid idea and the

support of investors, the company has expanded its market share and stands out for its quality, competing even with first world solutions. It is a rare case in Latin America of innovation taking place right in the sector's technological core, launching a world-class innovative product that has the potential of inspiring other young scientists and technologists in the region. It is worth noting that its founder is a woman.

www.laboratoriototh.com

“BioToth is the result of an integration of biotechnology and biochemistry applied to sanitation engineering, which uses microorganisms’ physiological functions for the effective treatment of wastewater and the sustainability of water resources”

12 Sem Dengue- Sin Zika

2015
Starting year

Brazil
Country

Technological and Social-organizational
Type of innovation

Does not apply
Social equality

Does not apply
Gender equality

150,000
Number of beneficiaries

Urban
Area

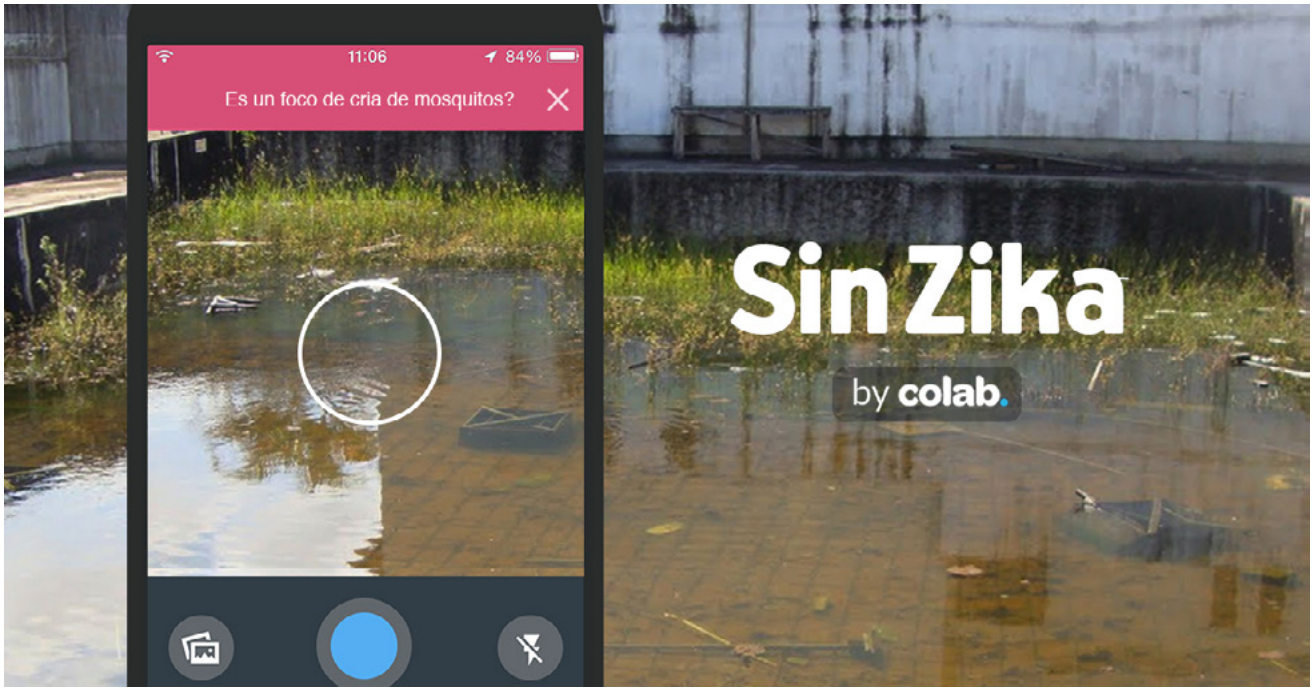
Sanitation and health
Topic

Gustavo Maia
Founder

Startup. Gustavo Maia, advertising designer at the European Institute of Design in Barcelona, is the founder of Colab -a social network for citizens that has been recognized as the best urban application in the world, and is one of the top 5 government and participation applications in the world (UN).
Type of organization

Highlights

Sem Dengue - Sin Zika creates a virtual map that helps relevant authorities combat zika more efficiently and informs users on the health centers they can go to.



It is a powerful, pioneering tool that connects people directly with governmental health agencies that make decisions based on the information they receive and provide valuable advice to citizens. It has had positive acceptance and is being implemented in more than 25 cities in Brazil.

Brief description

Gustavo Maia studied Advertising Design at the European Institute of Design in Barcelona. He holds an MBA in Marketing from the FVG, and a certification in Business Administration from the University of Harvard. He is the founder of Colab, a social network for the general public that has been recognized with the best urban application in the world award, and is among the world's top 5 government and participation applications (UN).

With 150,000 users in Brazil and 100 town halls as clients, Maia was named Social Impact Entrepreneur by Endeavor. Representing Colab in 2014, he was voted Sustainable Citizen of Sao Paulo by CBN, Catraca Livre, and Rede Nossa Sao Paulo.

In 2016, Colab launched Sem Dengue - Sin Zika, a crowdsourcing application through which people can report potential reproduction areas of the *Aedes aegypti* mosquito, including pictures and geolocalization. This information is sent to town halls and relevant government entities. The application also allows users to report symptoms of fever and creates a virtual map that helps people obtain information about health centers they can turn to.

Innovative merits

Sin Zika uses a large array of existing innovations in the ICT sector, generating a highly innovative product which has also managed to scale very rapidly both in terms of the number of users and of effectiveness, which always represents a huge challenge for new apps. The secret to its popularity lies in the innovative capacity of adapting the solution to different organizational models and stakeholders in the health field.

www.sinzika.org

“Sem Dengue - Sin Zika is a crowdsourcing application citizens can use to report potential reproduction areas of the *Aedes aegypti* mosquito, with photographs and geolocalization”

Solid waste

13 ReciVeci

Urban
Area

Technological and Social-organizational
Type of innovation

High
Gender equality

30,000
Number of beneficiaries

High
Social equality

Waste
Topic

2014
Starting year

Ecuador
Country

Paula Guerra
Co-Founder

NGO*. ReciVeci is an NGO 100% driven by the civil society where volunteers have joined forces with waste collectors to contribute to generate a culture of recycling, effectively implementing inclusive recycling in the city.
Type of organization

Highlights

In the city of Quito, over 2,000 tons of solid waste are generated every day, 25% of which is potentially recyclable. There are more than 3,000 informal waste collectors, mostly women (70%) who collect, classify, and transport recyclable waste daily.

ReciVeci is a volunteering initiative that aims at connecting informal waste pickers and citizens in order to recognize, strengthen, and dignify the work of thousands of collectors in Quito through the provision of differentiated waste services.

* ReciVeci is currently in process of becoming an NGO.

Brief description

ReciVeci goes to the neighborhoods, where it begins by identifying informal waste collectors, and develops social organizations to strengthen their link to society as well as their incidence on public policy. It trains local dwellers on at-source waste separation and on recognizing their waste-collecting neighbor. Some of ReciVeci's strategies include working with allies in the academic, community, public, and private sectors in each neighborhood as well as using communication tools on social media networks and developing an app for Android and iPhone.

In two years, this volunteering project has attained excellent results, like a 300% increase in recovered recyclable solid waste by informal collectors, and the construction of a collection center with the support of architecture students and teachers from the Catholic University of Ecuador, the "Recicladores Sonreir Association: Shifting from Individual to Collective Work", 30,000 citizens benefit from the collection service thanks to the work of the waste collectors in two Quito neighborhoods. Other achievements include interaction between waste producing citizens and informal waste collectors at the "Coffee with the Recycler" social spaces; meetings and workshops between Town Hall officials and informal recyclers; alliances with the academic community (Benalcazar school, Catholic University of Ecuador, National Polytechnic University); presence of collectors' associations at the Red Nacional de Recicladores del Ecuador (RENAREC, Ecuador's National Recyclers Network); direct training to more than 1,000 households on how to sort solid waste at the source and on inclusive recycling; a network of 600 volunteers for specific projects; and promoting the role of waste collectors and inclusive recycling.

Innovative merits

ReciVeci is a prime example of social innovation in solid waste management that has reached great impact in a short time. The innovation focuses on the use of creative strategies to highlight the work of recyclers and share the individual work of the waste collector, as well as relying on new educational, training, and communication platforms. It innovates on strategies to attract hundreds of volunteers to the project as well as on the capacity to forge public-private alliances together with academia. It has also attracted the interest of others willing to replicate the system in other Latin American countries.

www.reciveci.ec

“ReciVeci pursues generating a culture of recycling, promoting citizen participation and developing inclusive practices with informal waste collectors through training, advisory, and tool development actions”

14 Chureca Chic

High
Gender equality

High
Social equality

Urban
Area

Waste
Topic

Nicaragua
Country

Andrea Paltzer
Founder

200
Number of beneficiaries

2009
Starting year

Social-organizational
Type of innovation

Startup. The company grew out of a program offering scholarships and job training grants to help low-income women escape the cycle of poverty they are trapped in. It is the commercial branch of the NGO Earth Educational Project.
Type of organization

Highlights

Chureca Chic is an innovative model of a sustainable social enterprise with a high level of gender equality, which aims to be replicated throughout the region. The initiative empowers and inserts hundreds of women in the labor market.

Brief description

Chureca was a landfill by the shore of Lake Xolotlan in Managua, where dozens of people settled after the city was destroyed by the 1972 earthquake. Little by little the site began to grow, and recycling the 1,000 tons of garbage that were dumped there daily became the main source of income for the families that settled there.

Andrea Paltzer, a young woman from Switzerland living in Nicaragua, created the NGO Earth Education Project (EEP), which offers hundreds women at the landfill a literacy and job training program. This gave birth to Chureca Chic, a social Enterprise that fuses recycling with jewelry.

Innovative merits

Chureca Chic creates a replicable sustainable social Enterprise model supported by an NGO (EEP) that runs an educational and job reinsertion program for women from low-income households. The company is self-sustaining and relies on the achievements of the EEP program. The NGO relies on charity and corporate social responsibility actions.

This is a social innovation project that has managed to scale up quickly by way of novelty creation processes and based on the concepts of *lean startup*, originally introduced by Eric Ries (*The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, 2011). The venture -which has a strong component of gender equality-, successfully integrates inclusive recycling, its formalization, and the use of creative industries while applying a modern, sustainable business model and adequate distribution channels.

www.churecachic.com

“Churreca Chic is a cooperative of women in Nicaragua who use paper and cardboard to make art. They manufacture costume jewelry from solid waste and sell it nationally and internationally for fashion events”

15 Pimp my carroça

Brazil
Country

High
Social equality

Low
Gender equality

550
Number of beneficiaries

Thiago Mundano
Founder

Urban
Area

Waste
Topic

2012
Starting year

Social-organizational
Type of innovation

NGO. Pimp my Carroça is an NGO founded by Thiago Mundano that works with volunteers and receives donations from hundreds of people and dozens of foundations from around the world. The venture's originally massive success in Brazil has now extended to over 13 countries.
Type of organization

Highlights

The movement's origins can be traced back to 2007, when Thiago Mundano, a 20-year-old Brazilian graffiti artist, began to approach informal waste collectors to decorate their carts in his native city of Sao Paulo. Mundano refers to them as "invisible superheroes" given that even though their efforts produce significant economic and environmental benefits, they very rarely receive government compensation or basic social security benefits. On the contrary, they suffer hazardous work conditions, extreme exploitation, police harassment, and public shaming.

Brief description

Since he began creatively linking a marginal form of art (graffiti) with marginalized workers (waste pickers) in 2007, Mundano has managed to enhance the social status of the two. Over the following five years, he painted 160 comics, characters, and messages like "My vehicle doesn't pollute" and "My job is honest, is yours?" on carts. It was a good start but Mundano understood that the dimension of the problem he was facing (15 million waste collectors in the world working without recognition) highly exceeded a single person's efforts.

In 2012, Mundano got together with friends to launch Pimp my Carroça, a play on words on MTV's *Pimp my ride*. They organized mass events where volunteers painted and repaired waste collectors' carts offering social services and conducting artistic interventions (for example, painting logos of waste collectors' carts on bicycle paths and parking lots to support their "right of street".)

In 2016, Pimp my Carroça painted 507 carts in 48 cities in 13 countries with the help of 1,854 volunteers and 2,686 contributors.

Innovative merits

Pimp My Carroça is a highly impactful and original social innovation project that has managed to expand to eight countries and continues to be one of the most significant Latin American social innovations in recent years.

Through innovation, the project manages to integrate waste pickers into the social fabric, making their work "productive" in people's minds and boosting their chances of improving their living standards. By making their contribution visible, it mobilizes popular and political support to change things, besides generating new laws and policies.

Pimp My Carroça was chosen as one of the finalists of the 2015 IDB-FEMSA Awards.

www.pimpmycarroca.com

“Pimp my Carroça has rescued informal recyclers from anonymity in 48 cities in 13 countries from around the world and relied on the art of graffiti, commitment, and collective participation to highlight their contribution to society”

Although the following five cases are only emerging innovations, they have high innovative merits; they are highly promising projects that deserve serious consideration and could end up being quite successful.

16 Plasma Water

Alfredo Zolezzi
Founder

Technological
Type of innovation

Does not apply
Gender equality

Urban / Rural
Area

3,000
Number of beneficiaries

Water
Topic

2009
Starting year

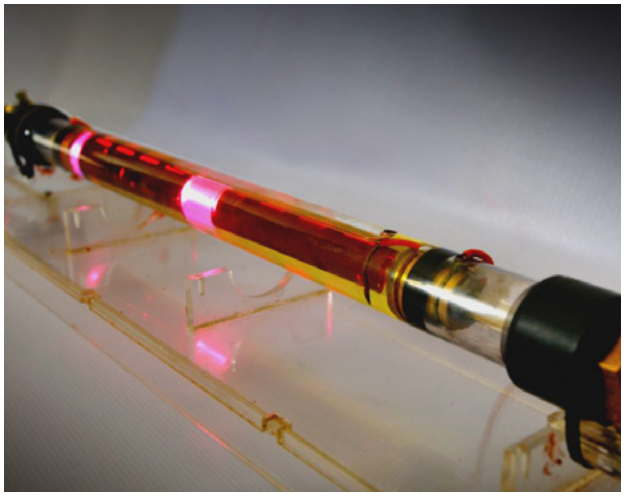
Does not apply
Social equality

Chile
Country

Innovation center. Plasma Water is a private center founded by Chilean scientist Alfredo Zolezzi, who invented and patented this highly complex technological system focused on the development of radical innovations in the field of fluid mechanics, electromagnetism, and microwave applications.
Type of organization

Highlights

Alfredo Zolezzi's water purifier can transform the lives of millions of people worldwide if it manages to scale sustainably. Alfredo Zolezzi previously invented different technologies to help corporations improve oil refinery processes. In 2009, he focused on developing innovations for clean water.



Brief description

The Plasma Water Sanitation System (PWSS) eliminates 100% of the viruses and bacteria present in raw water by converting water into a plasma state. By dramatically dropping the pressure in a reaction chamber, water is transformed into a two-phase current: liquid and gas. A magnetic field is applied to this current, ionizing the water particles and generating a stable plasma state. Microorganisms are then impacted by a series of phenomena characteristic of the plasma state: ionization, irreversible electroporation, and tearing of their genetic material. When brought back to normal pressure conditions, the elements of water recombine and condense as clean water suitable for human consumption. The whole process takes just a few milliseconds.

This innovative system has still to complete final technical testing and reduce operation and maintenance costs to be scalable. Yet, it has already been installed in several countries throughout Latin America. Further technical tests are in the pipeline that should help it reach sustainable, mass-production stage.

Innovative merits

The innovative merit in this case is very high and of a pure technological nature. It is a novel system worldwide worth patenting in many countries. The innovation is radical since there are no records anywhere in the world of having used the plasma state to treat water. Therefore, the expansion of this innovation has been slow given that more technical tests must take place for the high operation and maintenance costs to be reduced in order to reach a sustainable solution for Latin America.

It is a paradigmatic case of high-level technological innovation of the kind typically seen in the United States or Europe. In the face of disruptive innovations, some patterns come up repeatedly in Latin America: difficulty to scale the innovation due to lack of support from the government, academia, the public-private sector and society at large. Innovation ecosystems are necessary to scale this type of disruptive innovation more quickly; although there may not be many in Latin America, they could develop progressively to transform the innovation ecosystem, provide safe access to water throughout the region, and additionally sell to more markets and with better profit margins in slow or incremental innovation sectors such as water and sanitation.

www.aicchile.com

“Paradigmatic case of technological innovation of top-notch scientific level that eliminates viruses and bacteria present in raw water by bringing it to a plasma state”

17 Yakka

Chile
Country

Does not apply
Gender equality

Alejandro Abarcia
Founder

Rural
Area

Technological
Type of innovation

Intermediate
Social equality

Not available
Number of beneficiaries

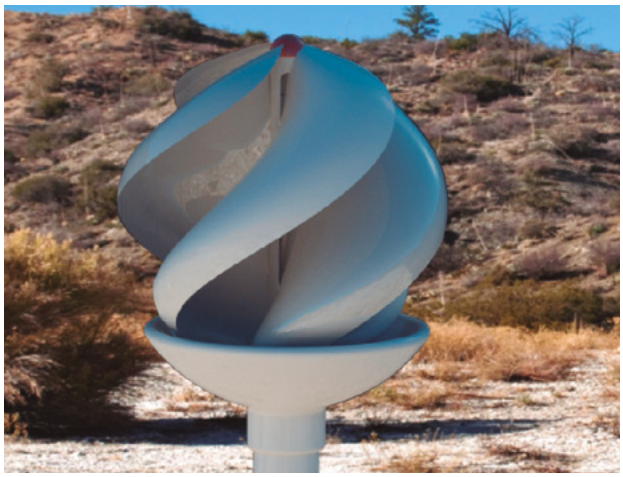
2016
Starting year

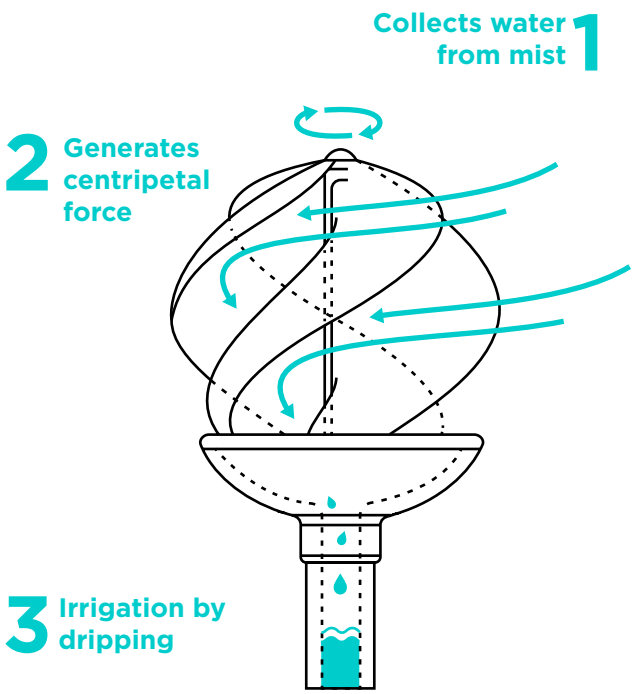
Water and Green Infrastructure
Topic

Startup. Yakka was created in 2016 by Alejandro Abarcia, who won the Seed Capital ward instituted by Chile's Production Development Corporation (Corfo) with sponsorship from the Chrysalis Atacama business incubator. Yakka was also one of the top five winners of the program Inventa Comunidad, an initiative jointly launched by the Minera Candelaria mining company and Chrysalis Atacama to promote social innovation in northern Chile.
Type of organization

Highlights

Yakka was born out of the water crisis hitting Chile's Atacama region and the difficulties many people face to access drinking water. The problem is so serious that the quality of water in the area is one of the worst in the country. Given this problem, Yakka has sought to obtain water from fog, one of the cheapest natural resources and also one of least impactful on the environment.





Brief description

Yakka obtains water from fog and dew that gather on the hillsides. The product, which is still in a pre-market, prototype phase -although there already are interested customers- is a type of white, compact R2D-2-looking corkscrew-shaped device that captures more fog than traditional systems, with 95% efficiency (figure obtained via a wind tunnel simulation.)

Alejandro explains that fog-catching systems have existed for a long time in different areas of Chile and around the world, but their main problem is wind: when the wind blows hard, they tend to break or capture insufficient fog. This makes them an inefficient solution to solve the lack of water affecting farmers and households.

Yakka has a triple function: it collects water from fog, it stores it within its own device, and it later controls the dosage necessary to meet the water demand at the area of implementation.

Additionally, Yakka not only aims at installing its own devices but also at raising water-use awareness -especially in areas of declared water scarcity-, through workshops and activities that help generate a culture of water care and optimal use in daily activities.

Innovative merits

The innovative merit of this project is of a technological nature—an innovative device. It is the first time a fog-trapping system is designed so as to use wind to its advantage, thus radically improving the efficiency vis-a-vis traditional versions of such devices. Operational and maintenance costs have also been considerably reduced. The design is robust and scalable. But it has yet to reach market-validation and productive-scale stage.

Yakka is an example of a Latin American idea, a startup that finds a very innovative solution to improve fog-catching systems -the very systems that Latin America was a pioneer in developing many decades ago. Despite the still pending technological and market validations, the angle from which this innovation was conceived is very interesting: it takes advantage of the knowledge created in Chile on water supply from fog-catching systems to develop an innovative solution by improving their efficiency. It can also be an inspiration for other innovative systems in a region where insufficient cultural, academic, and social knowledge management often deny the continuity that scientific and technological ideas need to produce sustainable innovations with a long-term impact.

www.chrysalis.cl

“Yakka responds to the water crisis in northern Chile offering devices to collect, store, and dose fog water, putting a natural resource that is abundant in the region to an effective ecological use”

18 PumpnSpray

Technological
Type of innovation

3,000
Number of beneficiaries

2015
Starting year

Low
Gender equality

Interme-diate
Social equality

Jamaica
Country

Water and Hygiene
Topic

Urban/rural
Area

Jovan Evans
Founder

SME. The company was founded by Jamaican entrepreneur Jovan Evans, who quit a high corporate position in his country to launch his invention, the first prototype of PumpnSpray, and sell it in the domestic and regional markets after winning numerous national and international awards for innovation.
Type of organization

Highlights

There is a very relevant story behind the importance of this innovation. In 2015, a highly publicized, terrible water supply problem occurred in Flint, Michigan (USA) caused by a severe economic crisis that affected water quality. Servants Without Profit, a Washington, D.C. NGO, joined forces with the Richard Branson Center for Entrepreneurship - Caribbean (where Jovan Evans' invention was incubated) and brought the PumpnSpray solution from Jamaica to guarantee safe hygiene during showers. Two hundred units were shipped to Flint in 2015, followed by a steady shipments flow during 2015 and 2016.

Brief description

PumpnSpray is a company based in Jamaica that commercializes a novel solution both domestically and in the region to provide safe hygiene during showers, hand washing, and other hygiene-related uses of water. It was created by Jovan Evans, a Jamaican entrepreneur who during his entire life had to endure the same conditions that thousands of Jamaicans must deal with: lack of access to clean water and safe hygiene. This included traveling several kilometers in a rural area to collect water in different types of containers. It is particularly difficult to take a bath when there is no piping system and no water pressure. Jovan came across a very simple and effective concept: using a small pressure-pump powered by foot, safe recycled bottled water containers, two flexible pipes, and an adequate sprinkling system, it is possible to take a bath with all the pressure, comfort, time, and recommended amounts of water, relying on a system that is very simple to implement and scale. The concept later was expanded to solve hand-washing, household utensils washing, and other hygiene-related issues. The innovation has received local and international awards from, among others, ScotiaBank Vision Achiever, the Richard Branson Center for Entrepreneurship, and the Annual Innovation Award in Jamaica.

Innovative merits

The merit of this innovation is of a technological nature. It has the particularity of being a very simple method to solve a major problem (the absence of adequate pressure for proper body hygiene) in rural and urban areas with no access to pressurized piped water. With very solid materials and design, it achieves a lofty goal by way of a simple device adapted to its milieu. It is the type of innovative idea that seems obvious once it's there: the simplicity and excellent execution in under one year (with very low time to market) is evidence of a very efficient innovation process and of a superlative understanding of the target market -conditions required for an idea to be innovative (knowledge quickly produces a social and economic impact)- and very easily scalable.

www.aquaflowjm.com

“Let’s improve people’s quality of life by optimizing their access to water, allowing them to shower, wash their hands, and have access to clean water”

19 Parques del Río Medellín

Technological and Social-organizational
Type of innovation

Urban
Area

Colombia
Country

2015
Starting year

500,000
Number of beneficiaries

Does not apply
Gender equality

High
Social equality

Medellin City Hall, Metro of Medellin, ISA & EPM
Founders

Sanitation and Green Infrastructure
Topic

Alliance. Sociedad Parques del Río comprises the city hall of the capital of Antioquia, with a 25% share, the Metro of Medellin (9 %), and EPM & ISA (33 % each). The partnership is in charge of the construction, operation, administration, and upkeep of the linear park on the Medellin River banks.
Type of organization

Highlights

Parques del Río Medellín is a mega project that aims to recover the river and valley of Aburra that cross Medellin and incorporate them into the public space and environment, improving the city's biotic system and preserving its balance.

The project gives the river back to the citizens, boosting up its role as the backbone of the urban ecosystem and as a major corridor for mobility and for the creation of quality public spaces. This integrated approach includes projects to clean up the river, transforming a road into a recreation hub, and creating new mobility arrangements, besides actions aimed at relocating settlements for their safety and preserving the environment.

Brief description

Parques del Río Medellín aims at completely transforming the river's environment by recuperating an unsafe part of the city and turning it into a recreation area, environmentally integrated with its surroundings and optimizing its role as a central corridor for mobility. The project depends on the construction of a new treatment plant to properly treat 95% of urban wastewater and either release it back into the river or reuse it in industry.

Besides turning a very busy road that crosses the city into a park, the project involves the construction of an electric tram along the hillsides to prevent slums from encroaching into unsuitable mountainous lands, erecting a public buildings belt, and densifying the city center.

Innovative merits

It is a major challenge for Medellin, and the first in a public-private partnership format. The project needs 15 years for full implementation and could mark the end of a process that has won worldwide recognition -recovering a city that had been taken over by drug dealers and giving it back to its people.

This is a megaproject with a highly integrating vision from numerous viewpoints, such as the river's environmental ecosystem and its hillsides, an urban development that naturally redirects settlements on the hillsides towards the riverbanks, the generation of green and recreational spaces in balance with mobility systems that include pedestrians and bicyclists, and the recuperation of a dangerous downtown area for the enjoyment of all citizens.

www.medellin.gov.co

“Parques del Río is a project that gives the river back to the citizens of Medellin by incorporating it into the public space and the city’s environment, turning it into one of the main corridors for mobilization and leisure”

20 CTAgua Uruguay

Public-private initiative that brings together 18 institutions
Founder

Does not apply
Number of beneficiaries

2017
Starting year

Interme-diate
Social equality

Urbana / Rural
Area

Low
Gender equality

Uruguay
Country

Social-organizational
Type of innovation

Water, sanitation and reuse
Topic

Alliance. Innovation center. CTAgua is a foundation that brings together academia (Uruguay's all four universities), the public sector (all of the country's relevant public stakeholders in water and sanitation), and eight large companies with innovative capacity operating in water and sanitation markets.
Type of organization

Highlights

This is the first Technological Center of its type in Latin America, launched with US$1 million in initial capital. Its most innovative projects integrate the Internet of Things and Big Data to water and sanitation management, in collaboration with another technological center: ANII, dedicated to ICT and ICT4V.

Brief description

The Centro Tecnologico del Agua (Technological Water Center) was created by the prestigious ANII (Uruguay's National Agency for Research and Innovation) in mid 2017. It aims to boost innovation in water and sanitation at national and regional levels by combining academia (all four universities in Uruguay: UDELAR, the Catholic University of Uruguay, ORT, and the University of Montevideo), the public sector (every relevant stakeholder in water and sanitation such as INIA, LATU, IIBCE), and eight large companies with innovative capacity for whom water is either a potential business line or are huge water consumers. Some are multinationals, like Coca-Cola, Danone, UPM (Finnish enterprise, a global leader in cellulose production), and businesses with high innovative capacity such as SALUS, Breeders & Packers, CSI-CIEMSA, Efice, and INALE.

The Center's goal is to solve national water and sanitation problems that exceed the capabilities and knowledge of each separate stakeholder by promoting synergy between academia and the public and private sectors. Some of its initial projects include water reuse, green infrastructure, innovative business models for service provision, tertiary treatment, water quality, aquifer management, and non-revenue-water reduction.

Innovative merits

It is the first innovation center of its type in Latin America that formally articulates the public-private capabilities. This is an innovative milestone in itself, and one that could be replicated in other countries. Support from ANII and Uruguay's excellent innovative ecosystem were key factors that helped bring it to life. Uruguay's daunting water and sanitation problems require the participation of major stakeholders, top-notch research centers, and public water management agencies in order to generate sustainable, long-lasting solutions. During its initial years, the center will focus on national problems and later on it will become a foundation and take advantage of its technological leadership and outstanding articulation abilities to provide services to the region.

By partnering with the ICT4V technological center (www.ict4v.org), the Centro Tecnologico del Agua can embark on highly-innovative technological projects that incorporate the Internet of Things and Big Data to provide solutions to water and sanitation challenges.

www.ctagua.uy

“CTAgua is a public-private coordination space comprising companies, technological institutes, and universities to articulate water solutions with an impact on the sustainable competitiveness of companies in Uruguay”

The IDB's innovative water and sanitation initiatives in Latin America and the Caribbean

Based on the premise that innovation needs to be a central component in any solution to the region's water and sanitation challenges, the IDB has launched several cutting-edge, high-impact initiatives. As we shall see, they also seek to generate a snowball effect, helping create a veritable flourishing innovation ecosystem in the region capable of growing incrementally thanks to the articulation of public-private partnerships, with a significant participation from academia and from each country's innovation agencies and a strong, active publicity drive. The IDB-FEMSA Awards are crucial to create a culture of innovation in this area and should be further promoted to boost their reach.

The IDB's innovative initiatives are described below. Some, like Hydro-BID, have the characteristics of being available to the general public and of having been developed on open access platforms. They also include strong training elements to facilitate their proper use:

21 Hydro-BID

2009
Starting year

Intermediate
Gender equality

3,000,000
Number of beneficiaries

Technological and Social-organizational
Type of innovation

Water
Topic

High
Social equality

Urban / Rural
Area

Mauro Nalesso
Lead Water and Sanitation Specialist, IDB
Contact

Several-LAC
Country

Multilateral organization. The project is one of IDB's innovative initiatives, and the Water and Sanitation division (WSA) has strongly promoted its dissemination and use throughout LAC.
Type of organization

Highlights

In 2017, the Hydro-BID Support Center was launched with backing from the PepsiCo Foundation (via AquaFund). The Center is coordinated by the Inter-American Development Bank and has the support of its member countries, which on top of upholding the initiative's implementation and consolidation, actively contribute to improve the administration of water resources on a regional scale. During the implementation phase, nation-wide training sessions were conducted in Ecuador in 2017 with the support of the National Water Secretariat (Senagua); in Guatemala, with the support of the Authority for the Sustainable Management of the Amatitlan Lake Basin and its Surroundings (Autoridad para el Manejo Sustentable de la Cuenca del Lago de Atitlán y su Entorno, or AMSCLAE); and in Argentina, with backing from the Intergovernmental Agency of the Basins of the rivers Limay-Neuquen and Negro (Agencia Intergubernamental de Cuenca de los Ríos

Limay-Neuquén y Negro, or AIC). The tool was also adopted in Brazil, where it was made part of the new decision-making system of Pernambuco's Agency for Water and Climate (APAC).

Brief description

Hydro-BID is an integrated quantitative system to simulate hydrology and water resource management in LAC under change scenarios (e.g. climate, land use, population) that helps evaluate water quantity and quality as well as infrastructure needs, and design strategies and projects to respond to such changes.

This system currently includes:

- a hydrographic dataset (LAC-AHD) containing over 230,000 delineated basins and river courses throughout the Latin America and the Caribbean region;
- a GIS navigation system to examine AHD basins and river courses with up- and downstream navigation capability;
- a user interface to specify the place and time to be modeled and the location from which the water availability will be modeled;
- a climate data interface to provide information on precipitation and temperature at the designated area and period;
- a rainfall-runoff model based on the Generalized Watershed Loading Factor (GWLF); and
- a scheme to quantify travel time and aggregated flow estimates on downstream basins.

Innovative merits

It is the only hydrologic and water resource management modeling tool that is interoperable and highly synchronized with other computer tools (from inputs to model outputs adaptable to other tools). It is the only tool based on hydrographic data that includes more than 230,000 delineated and pre-calibrated basins.

Above all, Hydro-BID stands out for its open innovation based on the concepts of Henry Chesbrough in his reference book *Open Innovation: The New Imperative for Creating and Profiting from Technology*, published in 2003: it successfully connects regional basins modeling efforts, making its findings available to governments, the private sector and academia. This innovative approach is also notable for its ability to articulate the efforts of different regional stakeholders.

www.hydrobidlac.org

“Recent climate events affecting our region prove that there is a need to use tools such as Hydro-BID to properly plan our water resources’ management”

22 Lazos de Agua

Social-organizational
Type of innovation

Water and Sanitation
Topic

2017
Starting year

High
Social equality

Several-LAC
Country

Urban / Rural
Area

High
Gender equality

200,000
Number of beneficiaries

German Sturzenegger
Senior Water and Sanitation Specialist, IDB
Contact

Multilateral organization. The project is one of IDB's innovative initiatives, and the Water and Sanitation division (WSA) has strongly promoted its dissemination and use throughout LAC.
Type of organization

Highlights

One Drop, the Inter-American Development Bank (IDB), the Coca-Cola Foundation, and the FEMSA Foundation on March 3, 2017 announced an initial investment of US$25 million in Lazos de Agua, an initiative to provide access to clean, safe, affordable water and improved sanitation services (WASH) to 200,000 people in Mexico, Guatemala, Nicaragua, Colombia and Paraguay by 2021.

Brief description

Lazos de Agua has a unique perspective from which to promote the development of new habits and the adoption of adequate water use and hygiene practices through social arts. Combining this with infrastructure, technical training, and access to capital, the program applies a system based on three key components:

- Access: Financing infrastructure projects
- Behavioral Change: Fostering community mobilization and promoting dialogue on culturally sensitive topics to boost awareness while promoting a change of habits on water usage and sanitation
- Capital: Support for technical training and financial assistance to allow households to benefit from market-based solutions

The Coca-Cola Foundation and the FEMSA Foundation have committed a total US$10 million. The Inter-American Development Bank has allocated US$5 million, of which US$2.5 million have already been approved as technical cooperation in Paraguay and Nicaragua. For their part, One Drop and their donors will invest US$10 million over the same period.

Innovative merits

The approach of the program Lazos de Agua is very innovative in LAC. It basically responds to the challenge of improving access to safe water and sanitation through collaboration with creative industries and taking a social standpoint. These features make it the first program of its type to have a regional scope. Lazos de Agua will implement the three-fold component system in an innovate fashion. It is clear that building water and sanitation infrastructure -although a critical element- is not enough to transform the lives of the beneficiaries. Most WASH projects typically focus on infrastructure without paying sufficient attention to the social or behavioral dimensions, which are critical at the time of raising awareness and garnering community support.

www.onedrop.org/en/news-event/lazos-de-agua-program/

“This novel way of implementing water, sanitation, and hygiene projects through its three components (Access, Behavior Change, and Capital) enables a comprehensive approach and changes the way in which the private sector conducts philanthropic work in this area”

23 Water Funds

Social-organizational
Type of innovation

Several-LAC
Country

Water and Green Infrastructure
Topic

Intermediate
Gender equality

2011
Starting year

High
Social equality

Urban / Rural
Area

70,000,000
Number of beneficiaries

Germán Sturzenegger
Senior Water and Sanitation Specialist, IDB
Contact

Multilateral organization. In 2011, The Nature Conservancy (TNC) together with FEMSA Foundation, the IDB and the Global Environment Facility (GEF), created the Latin American Water Funds Partnership to promote the creation and strengthening of Water Funds.
Type of organization

Highlights

During its first five years, the Partnership achieved:

- 19 funds operating in Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, and Peru
- More than 1.6 million hectares of positively impacted ecosystems
- More than 70 million people have begun to benefit from it
- Leveraged over US$120 million for investment in Green infrastructure

Brief description

Water Funds are financial, governance, and management mechanisms that bring together a watershed's relevant stakeholders to promote water safety in a metropolitan area through conservation actions (nature-based solutions or green infrastructure.)

They channel long-term investments for conservation projects that maximize filtration, reduce sediments and other contaminants to help improve quality, and regulate the water flow supplying cities. Water Funds strengthen watershed governance by bringing together stakeholders of interest -users, water management enterprises, corporations, authorities, and civil society- and providing solid scientific knowledge to streamline the decision-making process.

In June 2016, the second phase of the Partnership was launched; it will be implemented over a five- year period. Its main goal is to develop new funds and promote the sustainability of those already in existence, based on four main pillars:

- Science and innovation: Maximize watershed conservation efficiency and impact
- Public policies and business practices: Influence public policies and business practices towards the sustainable management of the water cycle
- Knowledge management and capacity building: Systematize experiences to transform them in knowledge and then propagate it
- Communication: Promote a dialogue among relevant stakeholders, simplify their relationship, and endorse a culture of preservation and integrated water management

Innovative merits

The Funds have been an innovative way to implement preservation actions sustainably. They're based on the innovative process of *biomimicry* (https://biomimicry.org/), originally defined by Janine Benyus as an innovating processes inspired on mechanisms that have existed in nature for millions of years, leading to sustainably-designed innovations that are already primarily focused on environmental care. Traditionally, *biomimicry* innovations consume minimum energy and are overall very low cost. The Partnership is a mechanism that provides technical-financial assistance for the creation and strengthening of Water Funds. It supports local stakeholders in their implementation, which contributes to establishing the management structure for each fund. At the same time, Water Funds are not subject to local governments' short-term political decisions since they are not linked to governments. This promotes a proper long-term vision, integrating different local actors who in turn benefit from an integrated water management. This strategic approach and governance of the Funds is highly innovative.

www.iadb.org/en/sector/water-and-sanitation/initiative-founds-partnership/home%2C20489.html

“With a portfolio of 19 Funds, the Partnership has directly intervened 200,000 hectares with conservation projects benefiting millions of people in the entire region”

24 Iniciativa Regional para el Reciclaje Inclusivo (IRR)

Waste
Topic

Several-LAC
Country

Social-organizational
Type of innovation

Urban / Rural
Area

High
Gender equality

2011
Starting year

High
Social equality

3,000,000
Number of beneficiaries

Germán Sturzenegger
Senior Water and Sanitation Specialist, IDB
Contact

Multilateral organization. The project is one of IDB's innovative initiatives, and the Water and Sanitation division (WSA) has strongly promoted its dissemination and use throughout LAC.
Type of organization

Highlights

There are about 4 million people in Latin America and the Caribbean whose livelihoods stem from recuperating and commercializing recyclables such as paper, cardboard, plastic, and metal.

Although these workers are the first link in the chain of the recycling industry, recuperating between 50% and 90% of recyclable materials used for manufacturing or exported out of the region, they only receive an estimated 5% of the profits.

Within this context, in 2011, the Regional Initiative for Inclusive Recycling (IRR, after its Spanish acronym) was set up by the Multilateral Investment Fund (MIF), the Water & Sanitation Division (WSA) at the Inter-American Development Bank (IDB), Coca-Cola Latin America, the Avina Foundation, Red Latinoamericana de Recicladores (Red-LACRE), and PepsiCo Latin America.

Brief description

The IRR was created to improve waste collectors' access to the formal recycling market in Latin America and the Caribbean by designing and implementing activities that:

1. Improve their socio-economic situation
2. Streamline their access to the formal recycling market
3. Foster the development of public policies for integrated management of solid waste which include the waste collectors

The Regional Initiative for Inclusive Recycling (IRR) aims to help the waste collectors' work to gain recognition and appreciation with the launching of this platform of strategic cross-sectional alliances that operates as a space for dialogue and action while boosting up coordination capacity on a national and regional level among the government, the business sector, and recyclers organizations.

Innovative merits

Generating a novel platform (previously inexistent in the region) makes IRR strongly innovative. This platform is able to coordinate public-private actions with great success. In a highly atomized market where regulations can differ dramatically from one country to another, the IRR improves waste collectors' social and economic status, giving them access to better living conditions and to a formal, well-regulated recycling market.

www.inclusiverecycling.com

“The initiative generates incentives in every sector for waste collectors to get organized and work together, which helps raise their productivity and improve their working conditions”

25 AquaRating

Urban / Rural
Area

2008
Starting year

3,000,000
Number of beneficiaries

Corinne Cathala
Lead Water and Sanitation Specialist, IDBD
Contact

Water and sanitation
Topic

Several-LAC
Country

High
Social equality

Low
Gender equality

Technological and Social-organizational
Type of innovation

Multilateral organization. The project is one of IDB's innovative initiatives, and the Water and Sanitation division (WSA) has strongly promoted its dissemination and use throughout LAC.
Type of organization

Highlights

During 2017, the AquaRating portfolio in the region developed in the following countries:

Colombia
Mexico
Jamaica
El Salvador
Argentina
Ecuador

This was the starting point for a program developed through a strategic alliance between SECO and the IDB in Colombia. Based on the results obtained by AquaRating, 10 water and sanitation operators are going to: define strategic and tactic plans, execute improvement plans, and organize complementary activities focused on the institutional growth and sector's development in the country.

Knowledge and experience exchange sessions have also taken place. For example, there have been cross-visits between operators that make up AR, e.g. between EPMAPS (first certificate) and ANDA, in which they shared knowledge regarding AquaRating and management practices.

Brief description

AquaRating is a rating system for water and sanitation utilities. It focuses on the challenges that water and sanitation service providers face integrally, evaluating their performance through indicators and management practices, setting an international standard based on information verified by independent auditors approved by AquaRating.

The system was conceived in 2008 by the IDB and developed through a strategic alliance with the International Water Association (IWA) to contribute to boost the efficiency and transparency of water and sewage utilities in order to help them provide quality, sustainable services.

AquaRating is currently used by water utilities, regulators, government institutions, and national and international funders as a guide to strengthen the water and sanitation sector.

Innovative merits

AquaRating is an innovative system in multiple dimensions: on the one hand, it efficiently harmonizes a cluster of good practices and knowledge to create a truly innovative, virtuous and constantly developing ecosystem in a sector whose knowledge management practices are typically opaque.

On the other hand, it provides a novel way of efficiently articulating best management practices in different systems and solutions -both public and private- through an outstanding process of continuous innovation, thereby improving and implementing innovative management practices in the water and sanitation sector.

Finally, one more, highly relevant innovating element: having successfully implemented cutting-edge transparency concepts that are vital for the sector.

aquarating.org

“AquaRating offers water and sanitation companies a comprehensive, impartial and reliable evaluation method, key to improving the quality of the services they provide”

Conclusions

Studying the 52 analyzed innovations, the top 20 selected innovations, and the IDB's innovative initiatives, it may be concluded that:

01.

There clearly is abundant and varied innovation in LAC's water and sanitation sector that produces tangible impacts of astonishing value. The myth of scant innovation in the sector seems to vanish in the face of a good amount of creativity and an innovative culture, both of which should be further stimulated.

02.

In general, there is a high rate of innovation in the sector in the Southern Cone, Andean Group, and Central America areas. Brazil is in the lead in terms of quantity of innovations and number of people benefiting from them. Bolivia, Peru, and Colombia come in second in both quantity and quality. The rest of the countries take third place. There are also prominent innovations in Haiti.

03.

In LAC, there is a high (and equitable) rate of innovation in water, sanitation, and solid waste. This is good news, given that LAC lags way behind in terms of access to safe sanitation vis-a-vis the existent gap in the water sector.

04.

There are incipient innovations in the green infrastructure and reuse sectors. Though we should expect these innovations to close the existing gaps at a faster rate, there are inspiring high-impact examples. The IDB has successfully reinforced programs that foster these sectors such as Water Funds, among others. Reuse is even higher for irrigation or manufacturing industry purposes, as well as in solid waste.

05.

From the analyzed sample, it becomes clear that urban and rural innovations exhibit similar rates in LAC with a slight tendency to favor rural innovations. This is remarkable, considering how off pace rural areas are and the difficulty of articulating multiple actors in such areas.

06.

Impact measured in number of beneficiaries of the 52 water and sanitation innovations comes close to 70 million people (including the impact of OCSAS in the region -a very high-impact initiative in beneficiaries mapped over the 52 innovations, even though it didn't make the top 20 innovations). This represents 10% of the people lacking access to safe water and sanitation (700 million people, according to the ambitious Sustainable Development Goal SDG6,) which is not an insignificant amount. As this report does not include all innovations in LAC, it constitutes a minimum threshold.

07.

Among the innovations reviewed, 60% had a strong social equity component, which seems adequate for LAC's socio-economic situation. It is important to note that the IDB's innovative initiatives aim at strengthening capacities and innovative projects that include such component.

08.

Out of the 52 mapped innovations, 16% had a component strengthening gender equality, raising up to 25% among the top 20. This is a meaningful rate, reflecting the convenience of reinforcing communication, outreach, and women empowerment policies in different innovative initiatives and startups throughout LAC, while recognizing those initiatives with a gender equality focus. Undoubtedly, these policies should be reinforced to reach further gender equality and include topics that have so far been ignored, such as female hygiene. This is visible in many of IDB's innovative initiatives as well as in the selection of the IDB-FEMSA innovation awards for water and sanitation.

09.

It is worth noticing that most of the 52 innovations (30) are social-organizational and technological/social-organizational. Looking into the 20 selected, the ratio of this type of innovations compared to technological ones grows (from 58% to 75%). Beyond any doubt, the combination of social-organizational innovations with technological innovations is the most powerful combination, offering a very high impact and potential for scalability.

In general terms, it should come as no surprise that higher-impact innovations imply a very good articulation between the public, private, community, and academic spheres, with new business models that can lead to inclusive water and sanitation markets that bridge the access gap to safe water and sanitation in LAC. In this sense, the IDB's innovative initiatives are perfectly aligned and must be empowered.

There is a strong tendency to disregard such innovations, making it important to develop dissemination strategies (this book being one of them), and generate efficient knowledge management systems, links with national innovation agencies, and technological cooperation programs with other regions and countries in the world (Europe, USA, Asia, Australia) which may complement two-way efficient technological transfer: we should avoid considering a single, north-south direction, and include technology and knowhow transfer from LAC to other regions regarding social and organizational components that can scale in many parts of the world. This leads to an innovation dynamic that creates virtuous cycles of research and innovation while developing pride and a sense of belonging, and strengthening innovation policies in the long term. This is consistent with the concept and practice of *frugal innovation* (Radjou, 2017), a very important kind of innovation in the world which many relevant corporations benefit from more and more.

From innovation maps in the water and sanitation section of LAC, we can draw some conclusions related to conditions, segments, and areas that lead to and generate innovative ideas and high--impact initiatives.

Inclusion and articulation between relevant actors: There is a whole array of stakeholders who, when joining forces on innovative initiatives, can get excellent results: multilateral entities (such as the IDB), public stakeholders (ministries of water, water and sanitation service providers, regulatory agencies, cities, and innovation agencies, among others), private actors (enterprises of different sizes, startups, social innovation companies), academia, entrepreneur ecosystems, and risk capital firms. When these six main actors (or at least most of them) work together, the result is high-impact, innovative water and sanitation initiatives. Needless to say, each stakeholder needs to have strong articulation and negotiation capabilities to weave together the complex fabric required to carry out these initiatives.

Level of innovation and entrepreneurship: At the same time, countries with stronger innovation and entrepreneurship ecosystems (e.g. Colombia, Peru, Mexico) show a drive for creative and innovative ideas that scale more rapidly. This is due to the promotion and mass dissemination of local ventures; in other words, countries with an innovative culture based on societies that favor resilient risk-takers resistant to failure. Likewise, when state-run organizations come up with innovative initiatives, it is because their technical and political leadership is typically characterized by creative people unafraid of taking risks and of pursuing untested, domestically developed solutions.

Adaptation to context and needs: Another very creative source of innovation in LAC stems from a deep understanding of the reality of each Latin American country and from selecting technical and social solutions that are sustainable, scalable, and well suited to their context. In this sense, there is an aversion among the most innovative segments to purchase first-world, turnkey solutions that tend to be short-lived due to lack of operability and maintenance. In innovations characterized by high gender equality, community anchoring and solution sustainability are more likely to take root.

Co-creation and empowerment of the civil society: Co-creation between beneficiaries and communities is also a key factor; when it exists and it is genuine, innovations turn out to be powerful and long lasting. Finally, the role of creative industries that partner with technical solution providers tend to achieve results with strong media impact and great replicability.

All of the points mentioned above can lead to actions and policies that boost innovation as a vector of expansion to gain safe access to water and sanitation systems.

As for the latest innovations, those that look promising but are just a few months old, some of the following recommendations and strategies can help them reach success:

Seek technical validation from leading organizations and institutions

Pursue alliances with public, private, and academic organizations for more innovation outreach, development, and implementation

Focus on the developed solution and not on other potential technological applications (avoiding the temptation of opening too many fronts in different sectors)

Seek coaching and consulting on business models and ways to scale up your innovation

Co-create solutions together with communities and end users

Carry out lean startup sprints and always innovate with the end user by relying on short cycles and developing minimum feasible products to validate with the client/end user the gradual approach to a complete solution adapted to the context

Be very proactive in financial leveraging during early stages with innovation agencies, multilateral agencies, or public-private investment funds

Perform a thorough research on state of the art solutions around the world to identify similar technologies that may be complementary to the innovations you have developed

Enter innovation and best venture contests to gain visibility and foster dialogue (for eventual improvement)

Lastly, there are still other strategies and mechanisms to promote innovation to consider:

Mechanisms to boost innovation in public and private companies

- Implementation of innovative acquisitions by public agencies in charge of water and sanitation systems management, where the main consideration be the innovating merits of the presented proposals. They may take place in key sectors where the impact of the innovation quickly scales in LAC, like solutions to reduce non-revenue water, intelligent billing, reuse or green infrastructure. Key disciplines may be prioritized which, based on intelligent technology, could boost the adoption of innovations like Big Data, the Internet of Things, predictive data analysis, smart metering, blockchain, among others, as well as ensuring proper public-private articulation and community involvement.
- Raising the R&D and innovation budget of public and private companies in the water and sanitation sector, optimally to 4-5% of the final billing. Generating innovation processes with metrics and results.
- Innovation challenges: present a concrete problem to be solved by a public or private company. Excellent international examples of this approach include InnoCentive (InnoCentive, 2017) and the program Desafios Innovadores (Innovative Challenges), of Uruguay's Agencia Nacional de Investigacion e Innovacion (ANII, n.d.). It is particularly interesting -given the context of innovations in water and sanitation in LAC - to promote challenges to be solved cooperatively through public--private organizations.
- Consolidation of research and innovation efforts in W&S through programs that articulate universities in the region, technological centers, innovative private companies, the IDB, and public entities. Creation of Latin American W&S knowledge management centers and adequate governance organizations to foster streamlined innovative initiatives that develop MVPs (minimum viable products.) A good and adequate starting point would be to expand the Centro Tecnologico de Aguas de Uruguay (Uruguayan Water Technology Center) to the entire region.

Mechanisms for financial leverage for innovation in public and private companies

- Creation of seed capital funds for prototype innovative solutions.
- Creation of risk capital funds for consolidated innovations in the sector to support companies or ventures in the challenging process of scaling the innovation. There exist a few examples, but they need to be strengthened with robust funds willing to make long-term investments. The funds may be of public-private origin.
- Strong incentives to fund socially innovative companies and organizations. Developing Latin American programs for social innovation. Social innovation events and festivals (e.g. FIIS - FIIS Park, n.d.-).
- Financial leveraging of B type corporations (such as with the x-runner innovation.)
- Articulation of innovative financing programs with national innovation agencies such as Ruta N (Colombia), FINEP (Brazil), CONACYT (Mexico), ANII (Uruguay), among others.

Mechanisms to promote a proactive innovation culture in public and private entities

- Organizing *design thinking* workshops on various levels and with every stakeholder involved both on a national and regional level, to promote a proactive culture of innovation.
- Creation of innovation spaces in public agencies and private companies linked to water and sanitation management, systematically inviting all employees to partake in brainstorming, *design thinking* workshops, and MVP generation. It must be incentivized from the top down and there ought to be a number of hours explicitly set aside for such activities every month.
- Generation of open innovation concepts (Berkeley Executive Education, 2017) and white space innovation (James, 2017) in the organizational distribution of public and private companies dealing with water and sanitation management.
- Organization of contests on innovative ideas in relevant public and private entities. The IDB-FEMSA awards are an outstanding example.
- Creating *living labs* in every country to carry out research/innovation by the public/private/academic/community sectors.
- Articulation of horizontal innovation programs with prestigious international institutes such as MIT or UC Berkeley in the USA, or Fraunhofer in Germany, among others.
- Increasing the number of technical and field visits by key people in public and private companies; similarly, communities should be exposed to award winning, innovative initiatives (such as those listed in this publication) to inspire and lead to synergies and permanent collaboration.
- Promoting the inclusion of technological and innovation articles by Latin American authors in relevant worldwide conventions.

Multilateral agencies such as the IDB could take the lead in several of the previously mentioned mechanisms, since they have the human, material, and financial resources to do it successfully. This would imply enhancing the already ample portfolio of innovation projects the IDB offers today, which was mentioned in the previous section. To increase and diversify innovative initiatives, multilateral agencies should ideally adopt an open innovation management style, incorporating clients, communities, and public and private agencies to further strengthen their innovation processes and market studies while taking the lead in regional innovation. At the same time, internal innovation capacities should be reinforced through formal innovation management, and Bank staff working in the area should be encouraged to propose novel ideas. These ideas could include offering ample financing to small- and mid-sized projects with significant innovative merits and that could be scalable to as many LAC countries as possible. Digitalization, digital economies, IoT, Big Data, blockchain, Smart Cities, creative industries, green infrastructure, social innovation, and innovative ways to articulate the public and private sectors may be areas of interest for the Bank to invest in, since they may lead to future innovations in the region. The use of challenge mechanisms for innovation is also highly recommended since it promotes public and private sectors collaboration. It is highly advisable to continue with the successful IDB-FEMSA awards to innovation and to further divulge them; holding the contest annually (as has been the case) is key to guaranteeing its quality and strong impact.

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