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Study of Social Entrepreneurship and Innovation Ecosystems in the Latin American Pacific Alliance Countries

Case Study: X-runner, Peru

Fundación Ecología y Desarrollo

Office of the Multilateral Investment Fund

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CASE STUDY

X-RUNNER, PERU

Multilateral Investment Fund (IADB) ·
Fundación Ecología y Desarrollo

July 2016

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Contents

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Isabel Medem, Co-founder of x-runner
Natalia Benavides, Co-founder of x-runner
Sebastián Prieto, CFO of x-runner
Baltazar Caravedo, Sistema B - Peru
Mónica Vasquez, Director Andean Region, NESsT

1. Introduction

Name: x-runner	
Description	X-runner provides a hygienic domestic sanitation service combining a portable dry toilet, weekly pick-up system and composting system. For a small monthly fee, x-runner creates a cleaner, healthier environment for low-income families in urban communities in Lima.
Founded	X-runner was founded in 2011 in Lima, Peru.
Legal format	X-runner is a non-profit association registered in Peru (*Sanisol*) and a private limited company registered in Germany.
Num. employees/volunteers	18 full-time staff in Lima and 5 volunteers.
Geographical reach	Lima, Peru.
Certifications/ awards	B Corp (2014) Best for the World B Corp Award, MIT innovators under 35 (2015), Agora Accelerator Class and McNulty Fellows (2013).
Social innovation variables	
1. Innovation type	The innovation lies in the closed cycle sanitation service for vulnerable communities with affordable, waterless and chemical free toilets and the production and sale of the compost generated.
2.Social impact	530 families have had their sanitation system improved by using the x-runner system, with more than 2,650 individual beneficiaries.
3. Financial sustainability	Users pay 14 USD a month for the weekly pickup service, as well as initial payment for the toilet installation. 92% of of revenue is still from grants.
4. Key Partners and Support ecosystem players	International Foundations have been key to the organization's early development, including Avina, NESsT, Separett and the Swiss Re Foundation.
5. Scalability and Replicability	Opportunity for scale if a market can be found for the compost, with almost 2 million people in Lima lacking adequate sanitation.
References	www.xrunner-venture.org

2. Local Social Issue and the Challenge

There are 2.6 billion people in the world without adequate access to sanitation and in many cases due to the lack of water based sewage services and infrastructure those living in the poorest areas of urban slums, these people can often pay up to 50 times more for their water than the wealthiest populations.[1]

In Lima there are 2 million people who do not have access to adequate sanitation, and in the peripheral areas of the city with human settlements established through illegally occupied land, the lack of sanitation is particularly alarming. Due to the informality of these properties, water is difficult to access and inhabitants have no conventional sewer systems or any type of reliable sanitation facilities.

Poor sanitation leading to health problems

Most people make use of buckets or pit latrines, which tend to be poorly maintained and present many health problems in urban areas. Many people defecate either in the open or in dug latrines near their homes. When these wells are filled, they must build others or pay to have them emptied. The most common problems caused by pit latrines are that they fill up very quickly, contaminate the ground and the foundations of the house, drain into shared irrigation systems, attract flies, pollute ground water and can breed infection when they are not maintained properly. Diarrhea is a common consequence of this situation, and causes more deaths worldwide than Malaria, HIV/Aids and Tuberculosis combined.[2] The urban slum inhabitants therefore have to deal with diseases due to poor hygiene as well as facing economic problems and social exclusion.

Second driest capital on the planet

An additional challenge is that Lima is the second driest capital in the world, with climate change causing more severe droughts and pressure on limited water resources. This makes the usual water based sewage treatment even more inaccessible for the most vulnerable communities. There is no wastewater or solid waste treatment in these populations, and no alternative provided by public institutions.

An additional challenge is that in Latin America there is very little experience of the benefits of organic waste as a resource and limited awareness of appropriate technologies. Critically there is an absence of a regulatory framework for the conversion human manure into a source of energy and organic fertilizer.

[1] http://unhabitat.org/urban-themes/water-and-sanitation-2/?noredirect=en_US
[2] www.x-runner-venture.org

3. Solution and Social Impact

X-runner's mission is to bring reliable, safe and sustainable sanitation to low-income urban households that do not have a toilet. X-runner delivers hygienic in-home sanitation by combining a portable dry toilet, a weekly pick-up system and composting service.

Solution: A dry toilet

X-runner has designed a dry toilet and a reliable collection service for homes in peri-urban and marginalized areas in Lima. The dry toilet is an alternative sanitation system based on urine separation technology; it does not need water or piping to function. Feces are collected in a bucket inside the toilet, which is lined with a biodegradable bag. Urine infiltrates into the ground through a separate opening or is collected in a plastic canister.

Once a week a truck goes by the clients' houses, the service team picks up the buckets with the full bags and exchanges them with fresh biodegradable bags and sawdust to continue making use of the toilet. Finally, the truck transports the waste to a treatment plant where it is composted, and undergoes a deworming treatment. The final product is compost that can be used as a nutrient-rich soil for parks and gardens.

Social and environmental impact

530 systems have been installed in Lima so far, creating a positive impact on more than 2,650 people. Installing dry toilets in homes and collecting their waste weekly, x-runner gives self-confidence to these families that have seen significant improvements their health conditions since installing the systems. Moreover, there is a positive environmental impact due to the reduction in contamination to land and water systems from untreated human waste that would cause harmful health consequences.

4. The Social Entrepreneur

Isabel Medem was born in Germany from a Peruvian mother, graduated in International Business Administration from the University of Vienna (Austria) and completed a Masters degree from the business school ESCP Europe in Paris (France), London (UK) and Madrid (Spain). While working in the microfinance sector in Paris, she decided she wanted to live in a country where she could address tackle "*greater challenges*." She had observed firsthand the problem of lack of sanitation when she was in Africa working to promote microcredits. In many of the towns she visited in Tanzania and Madagascar there were no toilets. She recalls, "*I was struck that was such a serious problem of millions of households that lacked water and drainage, and how easy it could be to solve with a simple proposition like ours.*"[3]

On her return from Africa in 2011, Medem met Jessica Altenburger, who was working on an idea of portable toilets. Together they launched the x-runner social enterprise that provides sanitation solutions through dry toilets that separate urine and feces and provides people with something as fundamental as that "*having a toilet at home.*" Her first step was to set up a limited company in Germany to be able to access international development funds to carry out her mission. She then went to India to try to start the project there, however this initial attempt was not successful, the reason of which will be explained later.

After the lessons learnt from India on the cultural barriers associated with sanitation practice, Isabel Medem and her team are now operating in Peru under the legal structure of the non-for profit association *Sanisol*. There they started a pilot project with 40 families who paid a fee for the rental and installation of the toilet, supply bags and sawdust and regular collection of feces. They are now co-directors of an organization with 18 full time employees and have installed a total of 530 systems installed across the capital city.

[3] Picture and reference from http://www.technologyreview.es/tr35peru/1525/isabel-medem/

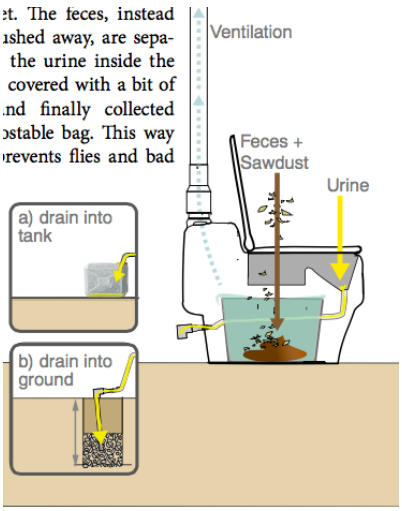
5. Business Model

X-runner's business model has been carefully designed to meet the needs of urban families without previous basic sanitation. This includes technical aspects, such as material durability and ease of installation and an appropriate financing model to ensure the sustainability of the system and to avoid families dropping out of the x-runner service.

There have been several attempts supported by municipalities and private organizations to create solutions for basic sanitation in Latin America, India and East Africa; however very few have been successful in the long term. Many have used inappropriate technology, often low quality or defective systems that fail over time; others have failed to put in place the necessary training and long term follow-up needed to ensure that families incorporate the system into their daily sanitation practices. Other programs have been too expensive and out of reach of many families.

5.1 Characteristics

X-runner's solution is a multi-step process consisting of onsite installation, training and long-term accompaniment for appropriate waste management. From the very first moment, x-runner promotes the technology and explains to future users how the system works and discounts are offered to users who spread the system to other neighbors.



When a family signs up to the system, x-runner's technical team goes to their home and installs a waterless toilet. The difference of this toilet is that the feces, instead of being flushed away, are separated from the urine inside the toilet, then covered with sawdust, and finally collected in a compostable bag. This way the toilet prevents flies and bad odors.

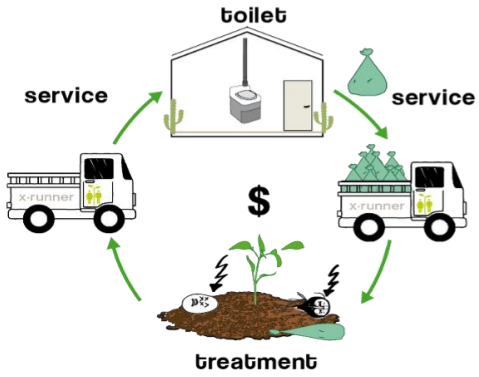
X-runner installs toilets made by the leading waterless toilet company from Sweden Separett,[4] which are environmentally friendly and similar to a modern WC in terms of design, stability, comfort and usability. They can be installed in both warm and cold climates, and can be placed and fastened to the wall or floor. The toilet is supplied complete for simple installation, with a ventilation pipe to go through a wall and a

[4] www.separett.com

2-meter long urine waste hose, which goes into a hole that needs to be dug into the ground.

Weekly collection service

Once a week x-runner sends a truck to the communities and picks up the bags filled with feces. The truck takes different routes everyday, starting at 6am until 10am approximately, as this is the best timetable for people that have to go to work early or take the kids to school. A special song announces that the truck is coming: "families, families, the toilet which improves your home" (in Spanish: "*family's, family's, el baño que mejora tu hogar*"). "*Family's*" is the brand name for the dry toilet service. The driver waits for people who go down to their homes with a bucket with a bag filled with feces. A second x-runner worker collects this bag, returning the bucket with a clean, empty bag. A third x-runner worker checks and monitors the users and the buckets state of disrepair. Users who go to the truck are almost equally women and men. For the pick-up service customers pay a monthly fee of 14 USD that also includes access to education programs and ongoing technical support to ensure the long-term viablity of the system.



Currently, x-runner uses compostable plastic bags made by "Biobag"[5] which are imported from the US, to guarantee the quality of the compost and ensure that it is not contaminated with plastic. It has been very difficult to find a company capable of producing biodegradable bags strong enough for a good price, and impossible to find in Latin America so far.

The collected human waste is then transported to the treatment facility where it undergoes a natural treatment and is transformed into compost. The collected feces undergo a long sterilization process in order to meet the pathogenic and chemical standards set by Austria and Chile, which are needed to guarantee the quality of the compost.

The total sanitation and composting process takes about four months. X-runner is currently promoting the compost product to municipalities and tree nurseries, and has already sold the first bags of compost at the *Agraria* University La Molina (Peru).

In December 2015, x-runner submitted the compost to a parasitological and microbiological analysis, which resulted in a perfect concentration of fecal coliforms according to the parameters set by the Chilean standard for human compost. These results demonstrate that the compost is suitable for sale and can generate additional revenue for the company.

[5] https://biobagworld.com/ Bags are imported from USA by x-runner for the cost of 0.47 USD per bag

A total of 314 tons of fecal matter has been processed into compost by x-runner since 2012, and around 15 tons are processed monthly in 2016. So far no market for this compost has been identified due to the lack of regulation in Peru for human fertilizers. There is no legal framework in Peru allowing or prohibiting the sale of compost of human origin, so x-runner is not yet obtaining financial resources from this compost, however they are paying for its storage and processing.

X-runner has been working with the Peruvian *Agraria* University, as well as different scientists, to improve the efficiency of the composting process and storage. However, this output is a resource that still remains to be exploited.

5.2 Fee structure and finance model

Upfront fee

At a first glance, one of the biggest investments when installing an x-runner system is the toilet itself. The first two pilot projects in Lima used toilets made with fiberglass and manufactured in Peru. Manufacturing costs were very high and every toilet was given as a donation to the families, especially because this pilot area was particularly poor. Thanks to an agreement in 2014 with Separett, this Swedish producer made a donation of several toilets to test the population's acceptance of their system. Between 2014 and 2016, x-runner has since bought 830 toilets from Separett; 550 have been installed so far. The initial membership that families pay is 34 USD; however this does not cover the toilet installation costs. The costs are covered with the margin produced by the monthly subscription over time.

With the dry toilet, users can save 7% in the annual cost of building a latrine.[6] However, the health ravages that a latrine in poor conditions can cause far outweigh any monetary cost for the installation of a decent system. The other option the users have is to build a private sewage, but the cost of this is 10 times greater than the costs of a dry toilet.

Monthly service fee

Users pay a monthly fee of 14 USD for the collection service that actually costs double this to operate. For this reason, one of the priorities for x-runner in 2016 is to increase the density of users in the same areas in order to be more effective in the collection service. X-runner decided to launch a permanent promotion that includes a discount of around 3 USD in the service, for each user who installs the bathroom thanks to a recommendation of another neighbor.

[6] Calculation based on information from: Intersocial, 2014. "*Market Research for x-runner, member of the planning portfolio of NESsT in Peru,*" Lima.

In return for this monthly payment, x-runner has implemented an innovative collection system that consists in using small bank agents to process the payments such as the affiliates of the Peruvian banks, usually the Peruvian Credit Bank (in Spanish *Banco de Crédito de Perú*),[7] thereby inserting users in the banking system. In Peru small supermarkets or grocery shops work as bank agents where people can pay for basic services, withdraw cash or make a transfer. The service is made without extra fees from the shop and it is associated with the main Peruvian banks. Although x-runner has a relatively small client base, the users' regular payment has allowed x-runner to have a sufficient monthly financial resource for basic operations.

5.3 Target beneficiaries

The socioeconomic profile of x-runner users is made up of 74% of immigrants from different regions of the Andes and the Peruvian jungle. Immigrants travel to Lima in search of economic and social progress and end up facing a different reality from the one they expected. All users belong to the lowest socioeconomic scale: 87% belong to fourth quintile and 13% to fifth quintile. The average household size is 4 people and the average family income is between 490 USD and 710 USD monthly. 94% of the users used latrines before acquiring the x-runner dry toilet, while the remaining 6% did not have any toilet facility at all. Most of the time, land is taken by illegal occupation and families can wait more than ten years for becoming owners of the land. For this reason x-runner designed toilets to be easily transportable as people frequently have to move home.

[7] *Banco de Crédito del Peru* is one of the biggest banks in the country. The BCP Agents are affiliated businesses like corner stores, drugstores, hardware stores, bookstores, among others; whereby a person can make banking operations Income of approx. 1.000 USD, which is essential for the company's goal of reaching operational sustainability.

Lima is the second largest capital in the world situated in a desert, following Cairo. In the area in which x-runner mainly works (*Pamplona Alta*) water is provided with tanks twice per week at very high prices although is only 15 kilometers away from the most expensive shops and hotels in Lima. Families build their own houses on slopes, which is especially dangerous in an earthquake zone such as Lima. Slopes also make access more difficult to the houses as well as the installation of roads and drains. Currently, x-runner has 530 household customers, reaching more than 2,650 people with sanitation services. By 2017, x-runner wants to expand its service to 1,000 households, while also increasing its treatment capacity and improving service processes.

6. Social and Financial Performance

6.1 Social Impact Performance

6.1.1 Social impact achieved

Currently x-runner operates in 28 settlements in the south of Lima, located in the municipalities of *Villa El Salvador*, *San Juan de Miraflores* and *Pamplona Alta.* It offers services to over 530 families which represents more than 2,650 direct users divided as follows: 26% are adolescents between 13 and 19 years old, 39% are children between 0 and 12 years old and 35% are adults. Children are the most benefitted population due to their vulnerability against health risks caused by an inappropriate sanitation system.

According to data from the users, families spend between 7 USD and 12 USD every time they suffer from acute diarrheal diseases. In addition, these diseases can cause 2 days of absence from work and missed attendance at school. The results from interviews with users show that after 4 months of using the x-runner toilet, there is an average reduction of 12% in diarrheal occurrence. The organization has set another important goal: to implement campaigns that contribute to behavior change and practices related to health issues, hygiene and sanitation, with a broader audience.

X-runner's environmental objective is to minimize the use of water. The dry toilet consumes an average of 84 liters per year for cleaning the toilet, which is very low compared to the 9,450 liters of a pit latrine and with a minimum of 31,104 liters that a WC flushes down the drain every year.

Table 1. Evolution of systems installed since 2012

	2012	**2013**	**2014**	**2015**	**Total**
Systems installed	50	100	150	410	530

Beneficiaries	250	500	750	2,050	2,650

6.1.2 Social impact measurement

Measuring the impact of x-runner has two components: i) satisfaction-surveys conducted to users and ii) an indicator matrix created from two international social impact measurement systems called GIIRS4 and IRIS5. The surveys were first implemented in April 2014 and the matrix in March and August of the same year. The surveys revealed that 93% of users think that the dry toilet has improved their quality of life. Also, 86% of the users are satisfied with their dry toilet and 82% say that they plan to keep it for a long time.

In 48% of the households there was a member who initially did not like the toilet, however 64% of them changed their minds after 4 months. Moreover, the vast majority are satisfied with the comfort, smell, the absence of insects, improved hygiene and appearance of the toilet; and find it much better compared to their previous hygienic service, i.e. pit latrines.

In relation with the impact measurement systems, the first one used is GIIRS4, the system for measuring social impact used by *Sistema B*, the Latin American arm of B Lab, the organization that certifies companies dedicated to solving social and environmental problems. The second index used is IRIS,[8] an initiative created by the Global Impact Investing Network that promotes the measuring of social, environmental and governance as an essential part in investments, which seek high social impact.

6.2 Financial Performance

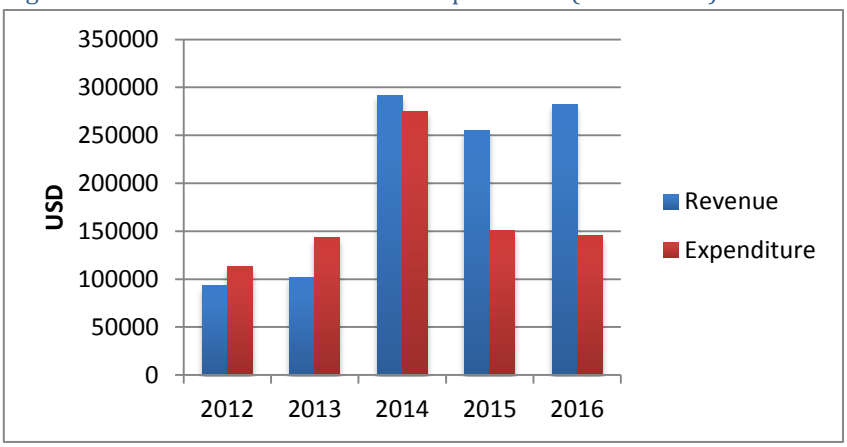
X-runner has shown a steady increase in revenue from sales since 2015, and in October 2015 a new part-time vendor joined the team, as well as a sales supervisor. A new Chief Financial Officer was hired in May 2016 to look for new paths for increasing sales and financial resources. The founders continue to be motivated by working towards the basic human right to sanitation and are committed to finding a sustainable means of providing this.

6.2.1. Revenue and Expenses

The company has received external financial support with both grants and investment from 2011, from Avina, Swiss Re Foundation, Grand Challenges Canada and NESsT, as mentioned below. In addition to the early investment, x-runner has also been attracting external donations. Figure 1 shows details of revenue and expenditure since the company was founded, with a notable increase in revenue during the period 2014-2015, during which time the company increased by four times its donations in comparison with 2013.

[8] https://iris.thegiin.org/

Figure 1. x-runner sales revenue and expenditure (2010-2015)



Currently, 70% of the users pay their monthly payment on time. Over the past 2 months, this percentage was significantly reduced, mainly due to the expenses incurred by the holiday season and in some cases a serious illness, theft or wage payment delays. It is important to mention that despite these late payments, users paid their arrears.

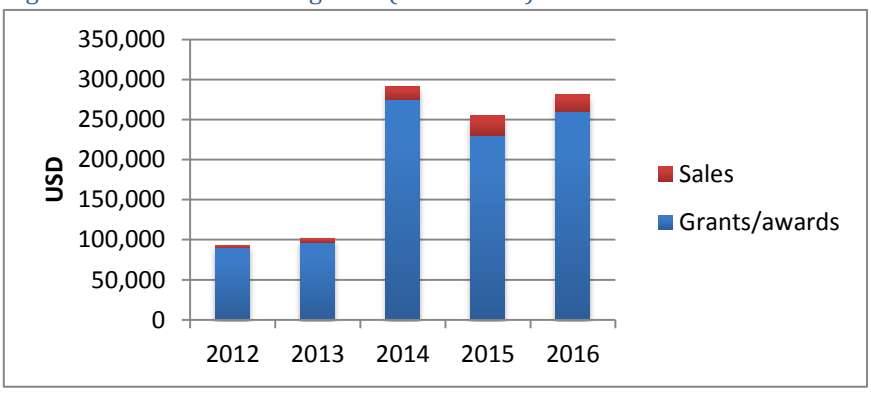
In terms of marketing, usually Sundays are used to inform families interested and install new equipment. The weekly sales of September 2015 were 1 toilet per week and October 2 toilets per week. For this reason, during the last months of 2015, a campaign was implemented with the support of Separett, which aimed to sell 50 toilets without the cost of 33.8 USD registration. The strategy involved six Sunday sports fairs in areas never before explored. The target was met by 72%, with a total of 36 sales. To date, the monthly sales rate is an average of 35 toilets.

Moreover, x-runner is also planning to hold workshops on health in communities that deal with sanitation. Thus, the company may emphasize its arguments against latrines, such as the fact that they fill up very quickly, or that the fecal waste is too close to the families' habitats, damaging the ground, they pollute waters and turn into infectious when they are not properly maintained.

6.2.2 Proportion of Income from Sales

Figure 2 shows the proportion of income from sales, where it is clearly shown that x-runner is still heavily dependent on external aid from grants with the current percentage of revenue from sales at 8.5%.

Figure 2 x-runner sales vs. grants (2010-2015)



Customer retention

Between March and December 2014, 17 users decided to drop out of the system; this means that x-runner had a retention rate of 88% that year. 7 users (41%) decided to move to other districts, because *Pamplona Alta* is characterized by being an unsafe place, so users often seek alternative districts to live in. The second most representative cause for dropping out of the system (23% of users) is that during the day there are very few people at home for the pick up service. In this scenario, the bucket is filled every two weeks and users feel they should pay half for the collection service. The third cause for leaving the system is that some people (2 users, 12%) built private and illegal drainage system. Similarly, two users (12%) decided to opt for the construction of a latrine, because they had the time, resources and space to pursue this alternative, and also because they preferred not to have a monthly payment. One user (6%) opted for leaving the dry toilet system, as the monthly payment is very high. And finally, x-runner was forced to dismantle the toilet of 1 user (6%), as the user has had not paid his monthly subscription for a long period of time.

X-runner has been improving its retention process, adding elements that facilitate the procedure and especially allowing the company to take the situation as a learning opportunity. All users with dismantled toilets are asked to complete an exit survey, which always provides valuable information.

Thus, x-runner is considering making an offer to families who are in the second situation for dropping out of the system, i.e. those who are not at home during the day. In other words, an offer to families that require a fortnightly collection service; or give them the option to leave their buckets at collection points at their convenience and thus not to have to be at home on a specific time for the weekly collection.

7. Business Development and Ecosystem Evolution

X-Runner has received considerable support from international organizations, however still has only a very small percentage of revenue from sales (8.5%) and is still in the early stage of development where key elements of the business model still need to be refined. The process of x-runner in Peru can be categorized into two stages: Start-up Stage and Early Stage.[9]

Table 3. Summary of x-runner´s business development milestones from 2010 to present

Stage	Year	Description
Startup	2010	German private limited company registered, Pilot Project carried out in India.
	2011	Financial support from Borealis. Research support from Eawag, *Rotaria Peru* and *Agraria* University.
	2012	First pilot project in Lima with 70 families.
	2013	B Corp certification and NESsT support. *Sanisol* registered as non-profit association in Peru.
Early	2014	New financial support from Avina, GCC and Swiss Re. Continue research support from Eawag, Agraria University and Agora. Family's Brand was born. Expansion in Pamplona Alta.
	2015	Separett supplied toilets with very low prices.
		Financial support from Swiss Re, Grand Challenges Canada, SWO and Doku. Student support from Stanford University, Emzingo, and Pacific University.
	2016	Expansion in number of families in Pamplona Alta: 530 families served (104 tons of feces and 52 tons of compost generated).

7.1 Startup Stage (2010 – 2013)

X-runner's first operation was to set up a limited company in Berlin (Germany) to attract funding for the project, and to act as the legal framework for initial pilots in India. These pilots were unsuccessful, because the Indian social model of caste systems made the gathering of excrement especially difficult. The next step was to try the project in Peru, which was easier because Isabel Medem is Peruvian and had a lot of contacts in the country.

[9] **Start-up stage:** a preparation period for setting up a business or an enterprise. An entrepreneur's team develops a business idea and a business model. In some cases, they have product/service prototypes, which are not fully developed or tested. **Early stage:** A period from business initiation until business scale-up. An entrepreneur's team may first deliver its products/ services in a test market to examine its business model. Also, the team may file patents or obtain licenses, if necessary. Once the business model is consolidated, it starts its business. However, the business remains quite small due to lack of capacity and resources. It may reach a breakeven point at the end of this period.

Both for personal family reasons and a clear need for sanitation services in Lima, Isabel moved to Peru and started a new pilot in Lima in 2012. In 2013 she then set up the non-for profit association *Sanisol*, a non-profit association.

7.1.1 Milestones

In 2012 x-runner carried out a pilot project with 50 families in *Villa el Salvador*, another vulnerable area in Lima with families without possibilities of paying the monthly amount of 14 USD. In 2013 x-runner decided to work in another district, *San Juan de Miraflores*, with better payment capacity but with a high level of dispersion.

The enterprise started its pilot in Lima in 2012 using a human-centered design process. Many of the key lessons from that initial phase have remained: team members are very open minded and observant, they learned to never simply fall in love with an idea or process, but to test, experiment, and then to constantly improve.

What makes us a better company?

B Impact Report

Certified since: February 2013

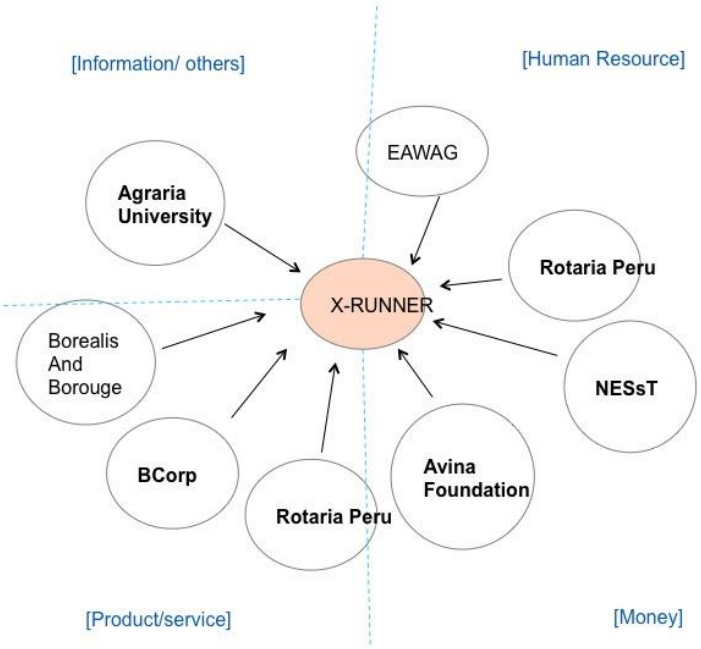
Summary:	Company Score	Median Score*
Environment	52	7
Workers	12	18
Customers	56	N/A
Community	19	17
Governance	8	6
Overall B Score	147	55

80 out of 200 is eligible for certification
*Of all businesses that have completed the B Impact Assessment
*Median scores will not add up to overall

7.1.2 Key supporters

Since 2011 x-runners collaborated with Eawag, the leading Peruvian water and sanitation research institute, as well as with Emzingo, an organization supporting MBA students to set up social enterprises. From the very beginning, Avina supported x-runner with financial resources and mentoring. In 2012, Borealis and Borouge, leading providers of innovative and value-creating plastics solutions contributed with know-how and expertise identifying which was the most appropriate material to use and how to improve the design and production costs.

Figure 3 Key supporters of Sistema Biobolsa in the Startup Stage



In 2013 the office for Territorial Planning and Sustainable Development of the *Agraria* University of Lima collaborated in research and volunteers, both key for the sustainability of the x-runner venture. *Rotaria del Peru*, with the support of the German international development agencies and private institutions set up "dry toilets" with two collecting chambers to a total of 72 families in *Pamplona Alta*.

Since April 2013, x-runner has become the first Peruvian company to be certified as a B Corporation, which means that it meets standards of social and environmental performance, as well as accountability and transparency. It participated in the Agora Partnerships Accelerator during the first half of 2013 and received MBA practitioners from the Kellogg University. Additionally, during the second half of 2013, the organization was selected to participate in the Business Incubation Program of NESsT in Peru and has also obtained funding from Grand Challenges Canada, Swiss Re Foundation and Avina.

7.2 Early stage (2014 – 2016)

For the early stage of the business, Isabel Medem and their team started to create social capital on the ground in Lima and also receive considerable support internationally, both resulting in a steady growth of the business. One of the first organizations to invest in x-runner was Avina, which supports early stage entrepreneurs providing access to sustainability solutions through a blend of risk capital and technical resources.

In 2015, CEO Medem made the Forbes 30 under 30-list in the category "Social Entrepreneurs". It made B Corp's top 500 "Best for the World List", and was named 1 of 100 SUSTAINIA solutions.

New brand: Family's

X-runner's new design and improvements in service and product are now packaged within a new brand, which highlights the key benefits that customers want to access: economy, hygiene and a modern lifestyle. The new brand is built on their key finding that the family is the main motivator to move forward in life. Hence, the brand "Family's" was created in 2014 with the slogan "*The toilet that improves your home*," as part of a marketing campaign targeting families and households in Lima who have aspirations for progress and to achieve a better quality of life. "Family's" is a neutral word for the brand, without translation in any language.

Spreading the brand became a fundamental aspect of the sales strategy, with the slogan promoted on the truck, the flyers, in the bathrooms and homes of users. The first strategy in sales and marketing, implemented from 2014, was to involve local businesses in the promotion. Nevertheless, local vendors did not want to assume the risk of a bad reputation in their community for selling a product that did not work. This was particularly as there is a considerable stigma around human waste.

From the lessons learned from the first sales strategy, a second strategy, which was implemented in August was developed. This involved presentations to the community and strengthening sales by recommendation of existing users of the toilet.

The first component of presentations was carried out in *Pamplona Alta* at Sunday assemblies where people discuss regular community affairs. The community is always eager to hear new proposals, although x-runner has had to be cautious not to get involved in local political issues. In order to have a greater presence in communities and assemblies, x-runner launched a volunteer program with students from the Pacific University of Lima. Between February and December, x-runner recruited a total of 33 volunteers.

7.2.1 Milestones

At the beginning of 2014, x-runner was a finalist in the prestigious "Unilever Sustainable Living Young Entrepreneur Award" winning a grant of 12,000 USD. In June, thanks to Emzingo, it received two American MBA students from the Spanish Business School (*Instituto de Empresa*) in Madrid who worked in the x-runner strategic development plan and the financial model. Finally, in August, the organization was finalist in the Peruvian Kunan Award "Inspiring Projects" category.

In November, the Spanish edition of the magazine MIT Technology Review awarded Isabel Medem with the "Peruvian Social Innovator of the Year 2014" prize. She was chosen among the top 5 most innovative Peruvians under 35 years old; and in January 2015, Forbes magazine included Isabel Medem one of the top 30 social entrepreneurs under 30. Between January and June 2015, students at the Design Institute of Stanford collaborated with x-runner in the design of products that complement the dry toilet.

From August 2013 to September 2014, 31 tons of feces were registered as collected, which produced an equivalent to 15.5 tons of compost. The amount of feces that enters weekly increases due to the bigger number of users that have been coming especially since August when more than 2 tons of feces were collected, equivalent to more than 1 ton of compost.

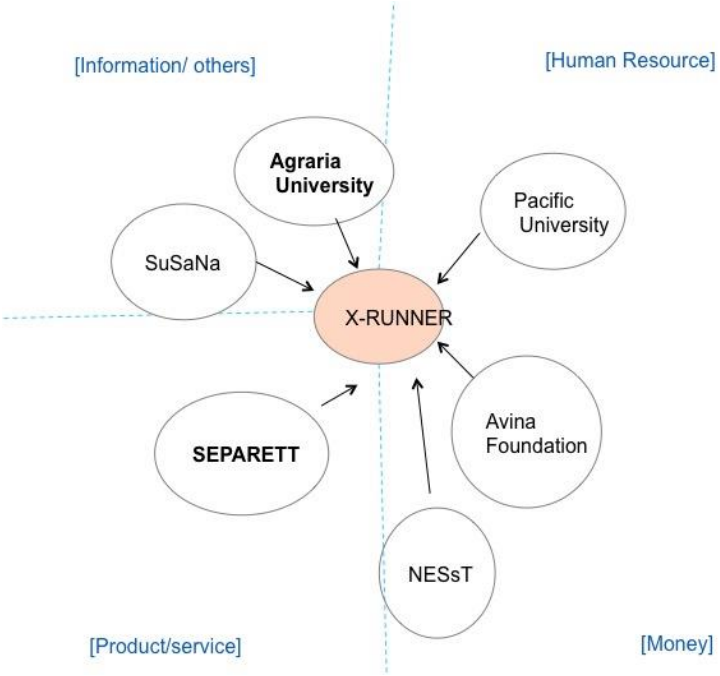
In 2014, x-runner decided to concentrate its project in *Pamplona Alta,* with more possibilities of paying and higher density of population. In the same year, Separett started working with x-runner, giving the company the first toilets for free.

The first educational x-runner campaign was launched in August 2014, its goal was to improve the practices of users in terms of punctuality, important for the efficient performance of operations; and to change attitudes and practices related to family hygiene and household practices; as well as strengthen the proper use and maintenance of the toilets. The closing of this educational campaign consisted of 2 workshops for adults; one on proper hand washing and the other on the prevention of dengue.

Finally, as an additional source of income x-runner is now studying the idea of not only collecting feces, but also urine, "*a waste with high value, less dangerous and more interesting than the feces from the point of view of recycling*," said Medem.

7.2.2 Key supporters

Figure 4 Key supporters of x-runner in the Early Stage



As shown in figure 4, Separett has been a key supporter at this early stage for x-runner, providing toilets at an affordable price. Also the Sustainable Sanitation Alliance (SuSanA) has shown interest and support to x-runner. This is an informal network of organizations with a common vision on sustainable sanitation from several countries.

Two universities (*Agraria* and Pacific) have been fundamental for providing volunteers to help promote new equipment. Avina, Swiss Re Foundation, as well as NESsT, continue to support x-runner in mentoring and finance, especially in the stage of expansion in *Pamplona Alta*.

8. Scalability and Replicability

X-runner is continuously working on research to improve its business and performance, and be able to scale and be replicated. Some of the innovations x-runner is currently working on are as follows:

- *NFC microchips (tags) for service process monitoring*: Small tags are attached to the toilet containers. At the weekly waste collection, service staff can scan the tags and feed customer data into smartphones. From the data, staff can assess in real-time whether there are any issues with the toilet, the payment for the service.
- *Efficient Microorganisms (EMs) to accelerate the composting process.* As composting requires considerable time EMs are added into the saw-dust provided to the customers, which they use after defecation. This allows the composting process to already start in the toilet at home - or in other words; composting starts one week before the waste actually arrives at the treatment plant.
- *Paying system through local bank agent kiosks* (in Spanish *bodegas*). This allows families to make payments in their area at their convenience; it incorporates them into the banking system and thus, gives them access to additional financial services.
- *Seeking new clients for final compost product.* Finally finding customers that are willing to purchase human manure, and overcome the stigma around this process is a key challenge to the organization's current business model and will be critical in terms of being able to scale.

Currently, there are 18 employees who hold positions in management, operations, design, marketing, billing, human resources and customer management. X-runner is responsible for taking the necessary occupational safety measures to ensure the health of the workers because of the risk environment in which they have to work. Likewise, it is also part of the partnership policy to work with constant feedback from the employees and encourage professional growth of each through training. According to satisfaction surveys, 90% of users would recommend the dry toilet and 93% believe it has improved their quality of life. Additionally, they immediately associate the toilet with hygiene, practicality and comfort. These results demonstrate that x-runner is achieving its mission of providing decent sanitation solution to peripheral areas of Lima where potential users that can lead to sustained business growth abound.
The medium-term goal is to serve over 1,000 families in order to cover the operating costs. New sales strategies are being implemented to achieve this objective, such as the commitment to promotions, the recruitment of volunteers and the use of the same users as sales channels through the benefits for recommendation.

Between October and December 2015 the number of beneficiaries increased by 41%. Thus, x-runner is committed to maintaining a constant rate of growth to achieve the objective and providing all the peripheral areas of Lima with this socially and environmentally solution.

9. Final Reflections

X-runner is a social enterprise in Peru that has received considerable support from international donors and institutions specialized in social entrepreneurs. Isabel Medem and the company have managed to gain international credibility relatively quickly, although the proposal is still not sustainable financially, given the current lack of market for the compost.

Key milestones

The certification of x-runner as a B Corporation was a very important step in the venture. Following certification many companies started to talk about x-runner and some important articles and interviews appeared in international newspapers about Isabel Medem and x-runner. Financial support, as well as mentoring and monitoring of the business by Avina (from the beginning) and NESsT in the later stage, were also fundamental for x-runner's consolidation, as well as the donations made by Swiss Re Foundation. The current support of Separett, which assumes the main costs of the toilet, was also crucial for the stage of expansion in *Pamplona Alta* neighborhood.

2016 will be key for guaranteeing the sustainability to prove that a very big part of a giant neighborhood could work with dry toilet systems. X-runner has successfully positioned its Peruvian organization (*Sanisol*) and the brand "Family's" for providing a quality toilet and dry sanitation system. Neighbors have built a close relationship with weekly "Family's collectors" and feel proud and happy with the service. X-runner has demonstrated to local authorities that it is possible to give this basic service if there is investment in the service.

Nevertheless, there are still considerable challenges to be solved. Above all, it is especially difficult to create a new market for human compost, which means overcoming the stigma and lack of regulation around human excreta without chemicals. This problem is not unique to Peru, and requires a solution for the project to become sustainable. X-runner has started to donate compost and plants to clients. Demonstrating the benefits of the compost will be key to start to build trust and consumer confidence in this unknown territory. Biodigestors or other waste to energy systems have not been considered so far for x-runner and the disposal in public landfills would be contrary to the circular service that x-runner proposes.

Second, it is a challenge to find a system that doesn't use plastic bags, to create a more effective pick up and to reduce costs and externalities. X-runner has been working on this since the very beginning and different methods have been tested with "Family's" imported biodegradable bags the best solution so far. Overall the key challenge is to rethink the business model to find a solution that is not so dependent on donations, although as Isabel Medem reminds us, basic sanitation is human right and she would like to be able to guarantee this in spite of market limitations.