Flood Resilience Alliance

SOLUTIONS BRIEF — MAY 2023

Improving basic sanitation in flood-prone areas of Nicaragua

Two new latrines (divided by sex) designed for the local school of the community of Paniquines, Chinandega, Nicaragua. September 2021. @Felix Rugama (Plan International)

Summary

From August to November, rural communities in Chinandega, Nicaragua, are exposed to pluvial and coastal flood risks, which cause already poor water and sanitation facilities to malfunction. Heavy rainfall floods latrines, risking human wastewater contaminating the groundwater and, in worst cases, the wells from which community members derive their drinking water. Using the Flood Resilience Measurement for Communities (FRMC), Plan International Nicaragua worked with members of four highly affected communities and identified basic sanitation as a key priority in increasing flood resilience.

Our approach

Between May and October 2021, Plan enabled access to safe-to-use latrines and water filters for clean drinking water for the most vulnerable families in the communities. In addition, Plan conducted a series of training sessions on the adequate use of the latrines and filters in order to maximize their lifespans.

In numbers

Cost of latrines:
US$33,825

Cost of water filters:
US$3,000

Time to implement:
Six months (design, construction, and training)

Lifespan:
15+ years for latrines and 10+ years for water filters

Yes — **Easy to replicate?**
Yes

Nicaragua

PLAN INTERNATIONAL

Listen to the interview
Community members discuss measures to improve water and sanitation access

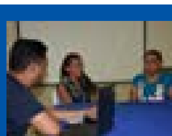

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Figure 1 *One of the old latrines in the community of Paniquines, Chinandega, Nicaragua. April 2021. @Felix Rugama (Plan International)*

What was the problem?

The FRMC study found the communities' water and sanitation systems to be inadequate. Latrines were made from materials which often did not withstand flood impacts and were hard to maintain (see Figure 1). The latrines were designed to be used for 2–3 years but were often used for 15+ years. Community members reported feeling unsafe whilst using the existing latrines due to their physical condition, and some latrines had 'spy holes' and therefore did not provide a safe space, especially for women, adolescents, and young girls. In the absence of alternatives, some people preferred to openly defecate rather than use unsafe latrines.

What was the solution?

To address the issue, Plan worked with communities to identify families and individuals most exposed to flood risks due to location and old latrines. Plan also partnered with the Nicaraguan Institute of Territorial Studies (INETER) to help construct latrines for local schools and provide training on their use and maintenance.

The new latrines consist of a septic tank, a metal hut, a roof cover, and a door. The design considered the highest water level from past floods, thus reducing the risk of wastewater overflow. These latrines are stronger than old latrines and can better withstand flood impacts. Communities are trained in their use and maintenance to guarantee their sustainability. The expected lifespan of these latrines is 15 years, serving a family of five people on average as well as local schools.

Flood Resilience Measurement for Communities (FRMC)

The FRMC was created by the Zurich Flood Resilience Alliance in 2013. It allows users and community members to understand and unpack their resilience and to generate evidence about the ways in which a given area or community is already resilient to floods. It also provides a guide to further develop this resilience.

The process involves working with communities to collect data to assess 44 indicators called 'sources of resilience', which have the capability of generating resilience. The data is analyzed through several different lenses (the '5C-4R framework'), which helps highlight interconnections and dependencies in the data. This deep, systemic, and multidimensional insight can help the community to identify and implement resilience-building interventions.

The FRMC process is supported by a web-based tool and an app for mobile devices, which allow for the effective design of studies and seamless data collection and analysis.

Figure 2 *The water filters distributed to a family from the community of Kilaca, Chinandega, Nicaragua. October 2021. @Walther Mendoza (Plan International)*

Due to the latrine costs, Plan decided not to improve the infrastructure of the wells simultaneously, as this would have exceeded the budget. Also, the new latrines preventing human wastewater from entering the wells already significantly contributes to the health of the recipient families and the natural environment. Instead, Plan decided to distribute water filters to the recipient families (Figure 2). The families continue to collect water from the wells using a container, take it home, and then filter it to make it ready for consumption.

How does it increase resilience?

The new latrines are built to be more resilient than the old ones and can thus better withstand the impact of a flood. They do not contain any spy holes and therefore provide a safe space, especially for women, adolescents, and girls. The risk of contaminated drinking water from overflowing latrines has been significantly reduced. Furthermore, families can now filter their water, making it safe to drink, even if one of the latrines should be flooded during a future flood. Community members, including women, adolescents, and girls, participated in the design of this intervention, thus increasing ownership.

Overall, through the construction of 45 safe-to-use latrines, the distribution of 100 water filters, and training on their use and maintenance, Plan has improved the health and safety of 500 individuals and has strengthened the resilience of the community as a whole.

Success story

It is important to involve community members in the whole process as this creates a sense of ownership and, subsequently, ensures adequate use of the new facilities and thus the sustainability of the project.

> ***It has been a step forward for the community. The number of infections has reduced, and we no longer have sick children or people with diarrhoea or fever at this time of year. It will be the same long term as we have safe drinking water now.”***

(Belén de Jesus Mejia Garcia, from the community of Kilaca, Chinandega, Nicaragua)

One community member mentioned that it was much riskier for her son, who has a disability, to use the latrines during past floods as he could have had an accident. Now, the whole family is content because everyone can use a high-quality latrine and water filters.

The latrines and water filters were directed at households at high risk of flooding and are now easily accessible to be used at all times.
This intervention has increased the robustness of the local water and sanitation systems to withstand the impacts of future floods.

Listen to the interview

Community members discuss measures to improve water and sanitation access

Common conditions for success

Is this intervention appropriate for other communities?

Yes, if funding is available.

What conditions are needed for the intervention?

The water and sanitation system should be in poor condition.

Was there anything special about the communities where interventions were effective?

Community members helped to identify the most vulnerable families, and experts from INETER helped to construct latrines and provided training on the use and maintenance of the interventions.

Lessons learnt

- It is important to build relationships with stakeholders who have expertise in the subject, and are willing to operate and invest human and/or financial resources in remote areas.
- Managing expectations and communication is vital when the most vulnerable individuals are prioritized. Plan successfully did this by involving communities in intervention designs, thus creating a sense of ownership.
- Determining maintenance costs of interventions increases the sustainability of the project as communities are able to plan ahead in case additional investment is needed for maintenance in the future.

Get in touch

If you have any questions, contact:

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For more resilience solutions visit www.floodresilience.net/solutions

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Further reading

Zurich Flood Resilience Alliance (2021) 'Expanding community resilience in the face of floods' [video] <https://floodresilience.net/resources/item/expanding-community-resilience-in-the-face-of-floods/>

The Zurich Flood Resilience Alliance is a multi-sectoral partnership which brings together community programmes, new research, shared knowledge, and evidence-based influencing to build community flood resilience in developed and developing countries.

We help people measure their resilience to floods and identify appropriate solutions before disaster strikes.

Our vision is that floods should have no negative impact on people's ability to thrive. To achieve this we are working to increase funding for flood resilience; strengthen global, national and subnational policies; and improve flood resilience practice.

Find out more: www.floodresilience.net

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