ADAPTATION FUND

FULLY DEVELOPED PROPOSAL FOR SINGLE COUNTRY

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	**"Ha Ta Tukari, "Water our Life": Towards Universal Drinking Water Coverage for 21 Communities of the Wixárika Nation"**
Country:	Mexico
Thematic Focal Area:	Water Management
Type of Implementing Entity:	National Implementing Entity
Implementing Entity:	Mexican Institute of Water Technology (IMTA)
Executing Entities:	Lluvia para Todos A.C.
Amount of Financing Requested:	$8,000,000 (in U.S Dollars Equivalent)
Letter of Endorsement (LOE) signed:	Yes ☒ No ☐

NOTE: *The LOE should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities*

Stage of Submission:

☒ This proposal has been submitted before including at a different stage (concept, fully-developed proposal)

☐ This is the first submission ever of the proposal at any stage

In case of a resubmission, please indicate the last submission date: Click or tap to enter a date.

Please note that fully-developed proposal documents should not exceed 100 pages for the main document, and 100 pages for the annexes.

List of Acronyms

1. IMTA – *Instituto Mexicano de Tecnología del Agua* – Mexican Institute of Water Technology
2. HDI – Human Development Index
3. INEGI – *Instituto National de Estadística y Geografía* – National Statistics and Geography Institute
4. CONABIO – *Comisión Nacional para Conocimiento y Uso de la Biodiversidad* – National Commission for the Knowledge and Use of Biodiversity
5. RWH – Rainwater Harvesting
6. RWHS – Rainwater Harvesting Systems
7. IFAD - International Fund for Agricultural Development
8. SECAP - Social, Environmental and Climate Assessment Procedures
9. TNT – *Taller Nuevos Territorios* – New Territories Workshop
10. HDPE – High density Polyethylene
11. EE – Executing Entity
12. PROMARNAT – *Programa Sectorial de Medio Ambiente y Recursos Naturales* – Sectorial Environment and Natural Resources Program
13. PECC - *Programa Especial de Cambio Climático* - Special Climate Change Program
14. PEACC - Program for Climate Change Action
15. SDG – Sustainable Development Goals
16. CONAGUA – *Comisión Nacional del Agua* – National Water Commission
17. PROCAPTAR – *Programa Nacional para la Captación de Lluvia y Ecotecnias en Zonas Rurales* – National Program for Rainwater Harvesting and Ecotechnologies in Rural Areas
18. SEDEMA – *Secretaría del Medio Ambiente* - Environment Secretariat
19. UN – United Nations
20. NGO – Non-Governmental Organisations
21. UNDP – United Nations Development Program
22. INDESOL – *Instituto Nacional de Desarrollo Social* – National Social Development Institute
23. INPI – *Instituto Nacional de Pueblos Indígenas* – National Indigenous Peoples' Institute
24. FGRA – *Fundación Gonzalo Río Arronte* – Gonzalo Rio Arronte Foundation
25. INSP – *Instituto Nacional de Salud Pública* – National Public Health Institute
26. UNAM – *Universidad Nacional Autónoma de México* – National Autonomous University of Mexico
27. CEI - State Indigenous Commission of the State of Jalisco
28. ESP - Environmental and Social Policy
29. ILO - International Labour Organization
30. UNDRIP - United Nations Declaration on the Rights of Indigenous Peoples
31. FPIC - Free, prior and informed consent
32. CONAFOR – *Comisión Nacional Forestal* – Nacional Forestry Commission
33. UV – Ultra Violet
34. WHO – World Health Organization
35. ARCSA – American Rainwater Catchment Systems Association

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    b. RWHS with Concrete cistern
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4. Experience in the proposed field
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6. Analysis of San Andrés Cohamiata's Climate, Vegetation, and Erosion
7. Population Ranges and RWHS efficiency
8. Examples of the Consultative Process
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Programme Background and Context:

This program addresses the extremely precarious water access conditions being experienced in the territory of the *Wixárika* Nation, often known as Huichol, in the western Sierra Madre mountains (Figure 1). This remote and beautiful region, inhabited by one of the most iconic indigenous peoples of Mexico, is also one of its poorest, with some of the worst development and health outcomes in the country. Water access is very problematic, and most of the population lives with minimal amounts of often unsafe water, carried from small and dwindling springs and water holes spread thinly through the landscape. It is an arduous job, disproportionately borne by women, and the difficulty involved results in extremely low per-capita use, often in the range of just 10-15 litres per day. This contributes to the very high levels of child illness and mortality that are pervasive in the region. The Water problem in the *Wixárika* Nation has geographic, economic, development, and environmental aspects. The combination of steep, mountainous terrain, scattered, low-density settlement patterns, and low levels of economic development make water infrastructure hard to build and maintain.

Figure 1. *Map of the location of the Sierra Wixárika, Jalisco, México; along the location of the Agrarian Nucleus of San Andrés Cohamiata, within the municipalities of Mezquitic, El Nayar, and Valparaíso.*

Environmental and climate changes are making already difficult water conditions increasingly precarious. The region is very vulnerable to the persistent droughts affecting the entire northwest of Mexico and southwestern United States.

Rain-irrigated subsistence agriculture is fundamental in the *Wixárika* territory, and their mountain forests are highly vulnerable to desertification. Dryer dry seasons are seeing large forest fires, some of which burn for weeks, and the thinning forests and eroding soils hold less water. Springs and water holes are shrinking under combined pressures of reduced recharge, and increased demand from a growing population trying to meet its needs. The Sierra normally gets considerable, though short and concentrated, summer rains, but with little retention and storage capacity, the water flushes directly down the canyons and gorges, leaving the landscape dry and the population scarcely able to meet their most basic needs.

This program seeks to scale up a line of work we have been carrying out with *Wixárika* communities over the course of almost fifteen years, developing and installing rainwater harvesting systems that have proven highly effective at improving water access, quality, and resilience in the complex context of the Sierra. We seek to achieve sustainable and climate adaptive universal drinking water access in the 21[1] *Wixárika* villages of San Andrés Cohamiata, the largest population group of the 4 subregions that constitute the *Wixárika* Nation (Figure 1), through the installation of 1,000 rainwater harvesting systems (RWHS) cisterns, and landscape management for water retention and soil regeneration.

Economic/Social Context:

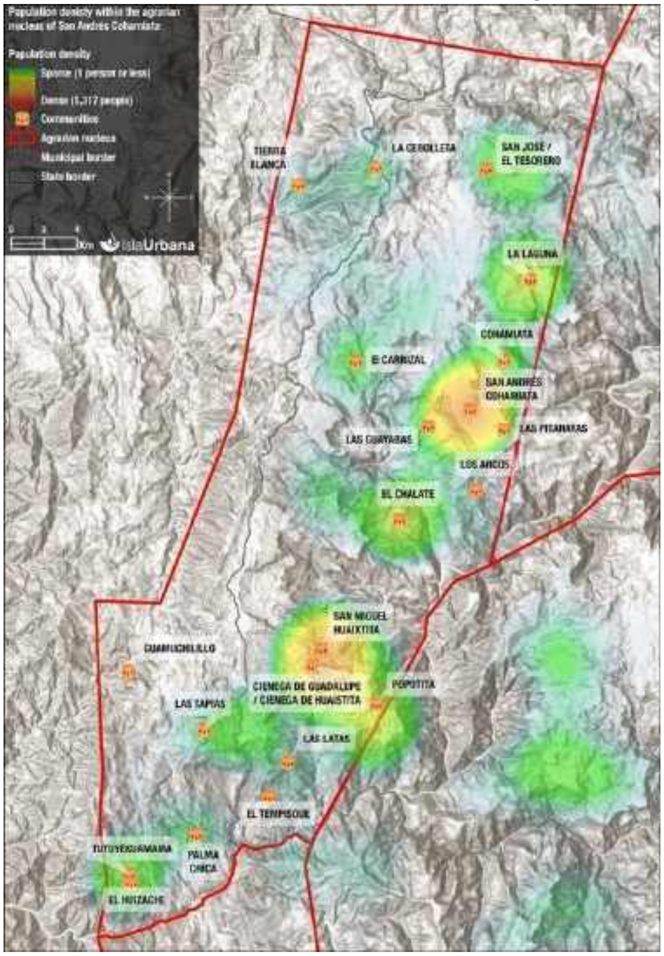
The *Wixárika* people live in one of Mexico's most isolated and underdeveloped regions, high in the western Sierra Madre, where the states of Jalisco, Nayarit, Zacatecas and Durango converge (Figure 1). The *Wixáritari* (plural of *Wixárika*) live in small villages and hamlets scattered amongst the imposing cliffs, mesas, and canyons that dominate the territory. One of Mexico's least assimilated indigenous communities, the *Wixaritari* preserve their native language and continue to follow the traditional spiritual belief system known as El Costumbre, which descends from their pre-European ancestors. The *Wixárika* people gained notoriety for the resilience of their rich indigenous culture, artwork, and their deep, elaborate spiritual traditions and practices involving the psychoactive Peyote cactus. They are an emblematic people, featured heavily in Mexican cultural and political displays appealing to national history and identity.


Photo 1. *Wixárika ancestor dressed in traditional attire (unknown author).* ***Photo 2.*** *Felipe Lopez Moreno, Rainwater Harvesting Systems installer technician, dressed in traditional Wixárika attire with his children.*

Despite this notoriety however, most *Wixárika* people today live in conditions of great material poverty.

[1] The First proposal stated universal access for 23 communities. But since, and through the work of the past 13 years, we have already achieved this in 2 of those 23 communities (La Cebolleta and La Laguna). The proposal is thus directed to the remaining 21.

Paid work is almost non-existent in the region, and subsistence agriculture remains a principal activity, despite the lack of arable lands and thin soils which result in very low yields. As a result, the *Wixárika* often leave home to work in industrial agriculture as labourers in neighbouring states, or to sell their crafts in towns and cities throughout Mexico, their travel expenses consuming much of what they earn. The erosion of food self-sufficiency and the introduction of new necessities like cell phones has pushed the *Wixaritari* into an economic system for which they have limited preparation. Many people, especially the most vulnerable members of the community, such as single mothers, or those with abusive spouses, have practically no income whatsoever and subsist minimally on support from family members. The traditional ways of life in the Sierra are being subjected to massive, converging pressures from the no longer distant outside world. The Situation the *Wixaritari* people face has recently become even more difficult with the increased presence and activity of organised crime groups in the region, who commit acts of violence, intimidation, and engage in extractivist economies like illegal logging.



Development/Environmental Context:

The territory the work takes place in is one of extreme topography, with sheer cliffs and canyons separating villages that might be a few kilometres apart as the crow flies, but take many hours of driving or walking to get between. Elevations range from around 600 to 2,200 metres, often within short distances, so the ecology and plant life of the region vary greatly. For hundreds of years and up until the mid-late 20th century, the *Wixárika* Sierra had no roads whatsoever, and the peoples living there were settled in very small, family ranches or hamlets, located in places near springs or water holes and land suitable for farming. The forests in the area, especially the higher elevation parts, were dense and rich in wildlife (Figure 2).

Figure 2. *Map of the location and population density of the Agrarian Nucleus of San Andrés Cohamiata and its 21 localities. The population density map was created using the mean coordinates of every official locality of the INEGI 2020 census within the borders of the San Andrés Cohamiata Agrarian Nucleus. A heatmap was created using a 300-metre radius from every locality's coordinates, with the total population within each locality serving as the main weight, in order to visualise the population distribution within the agrarian nucleus. However, the coordinates of every locality do not accurately represent the spatial distribution of the individual dwellings within each locality.*

Infrastructure development in the *Wixárika* region began with the establishment of airstrips, followed by government schools, and eventually in the 1980's and 90's, roads, the presence of which resulted in large scale logging, which in the telling of local people, changed the forest and made it significantly thinner, to this day. The topography and location of the *Wixárika* Sierra make it very vulnerable to soil erosion and climate related problems. The rocky mountains have only very thin soils, and the loss of forest cover, overgrazing from livestock, and increasing drought conditions in the entire region result in a desertifying landscape, with growing incidence of forest fires, less surface water, and tougher conditions for the subsistence farming the *Wixárika* rely on to feed themselves.

By almost any indicator, the area has very low development, with some of the lowest basic services coverage in Mexico. The great majority of homes have no running water, sanitation services are almost nonexistent, electricity only started reaching most communities in the last 10 years and is intermittent at best. Health and education outcomes are at the very bottom of national ratings.

The municipality of Mezquitic, where our work is focused and where the largest share of the *Wixárika* people live, has the lowest Health Index rating in all of Mexico , among the lowest education and income ratings.Also, this municipality has the lowest National Multidimensional Poverty Index (MPI) with (0.46) rating in the State of Jalisco (which is -0.617) and the fourth lowest at a national level (0.0). About 89% of the population lives in poverty and 55% lives in extreme poverty (CONEVAL, 2024), and it has an infant mortality rate of 76.66 compared to the national average of 16.76 (CONAPO, 2020). Tellingly, Mezquitic suffered one of the country's greatest reductions in HDI, falling 9.61% between 2010 and 2015. INEGI (Mexico's National Institute of Statistics and Geography) categorises the municipality as having "Very High" marginalisation.

The Wixárika region has experienced the highest increase in average Human Development Index (HDI) from 2010 to 2020 compared to all other indigenous regions in the country (Figure 3), with an increase of 0.55. The National Multidimensional Poverty Index changes from 2010 to 2020 in the San Andrés Cohamiata Agrarian Nucleus is the highest (0.70) compared to the 5 agrarian nuclei (0.65) and the overall Wixárika region (0.55). However, 2 localities within the Agrarian Nucleus, La Laguna and La Cebolleta, experienced a much lower increase of 0.13 and 0.1 respectively. The percentage of dwellings with no running water range between 49-57% within the Wixárika region. However, the locality of La Cebolleta has an astonishing 96% of dwellings with no running water. Given this, all dwellings in both La Laguna and La Cebolleta are equipped with RWHS, providing them with better access to clean water than most other localities in the Wixárika region.

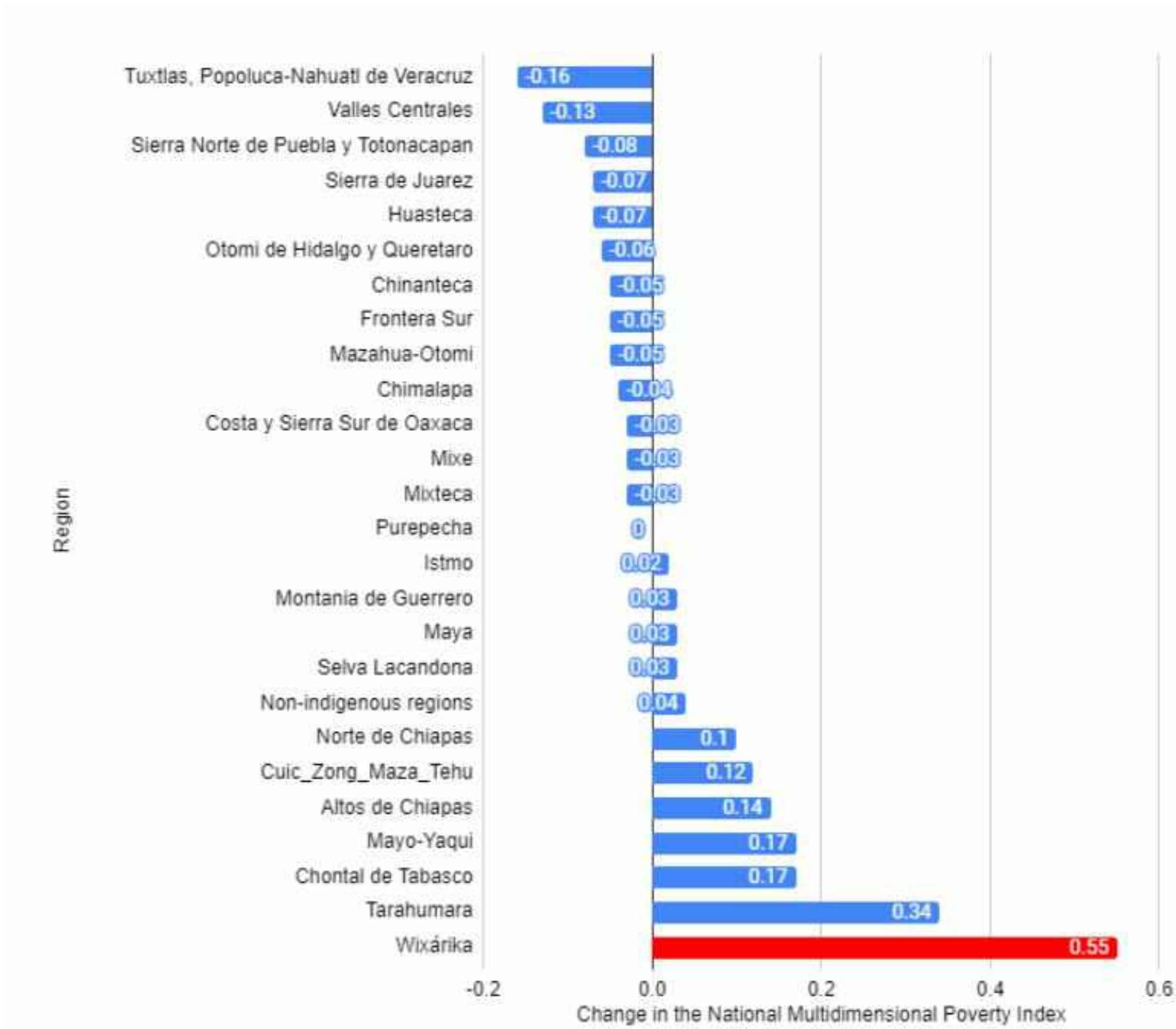


Figure 3. *Changes in the National Multidimensional Poverty Index from 2010 to 2020 in the indigenous regions of Mexico.*

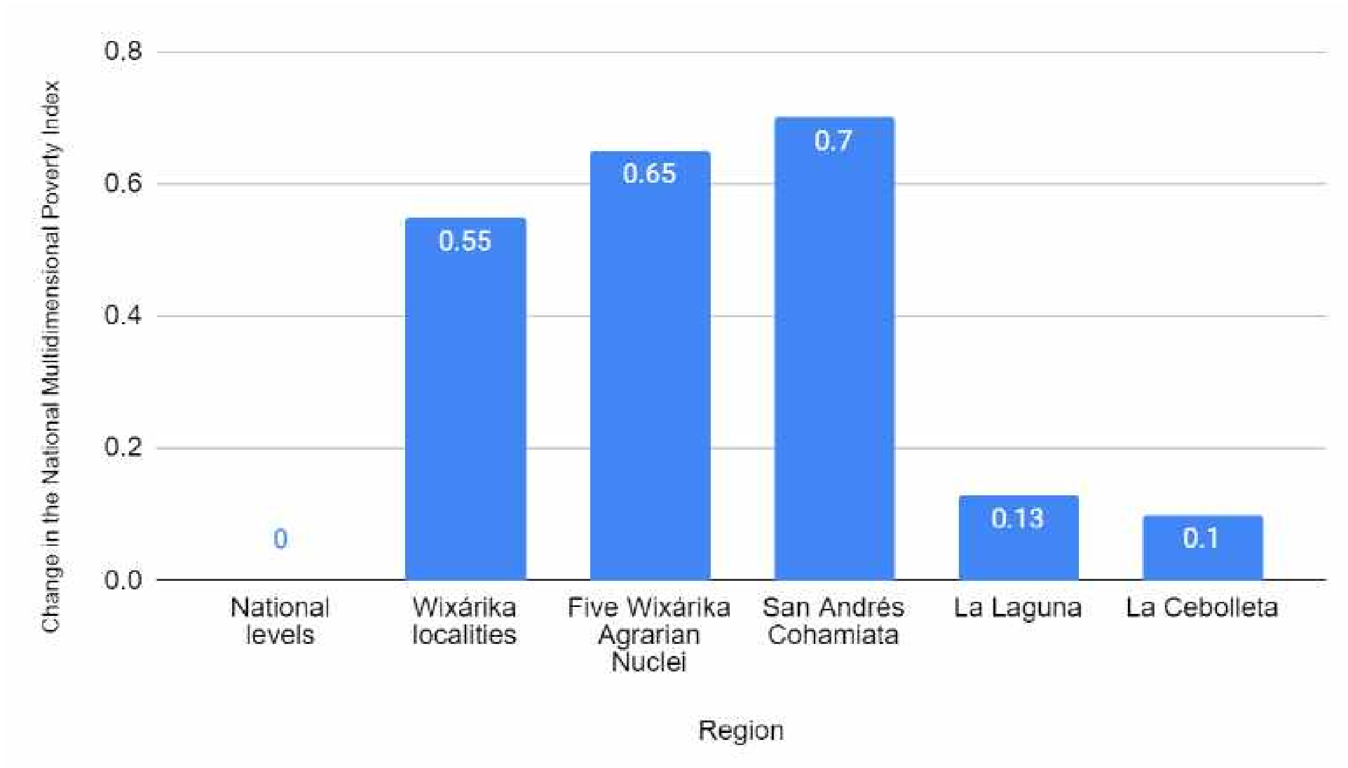


Figure 4. *Changes in the National Multidimensional Poverty Index from 2010 to 2020 in different regional levels within the Wixárita Region*

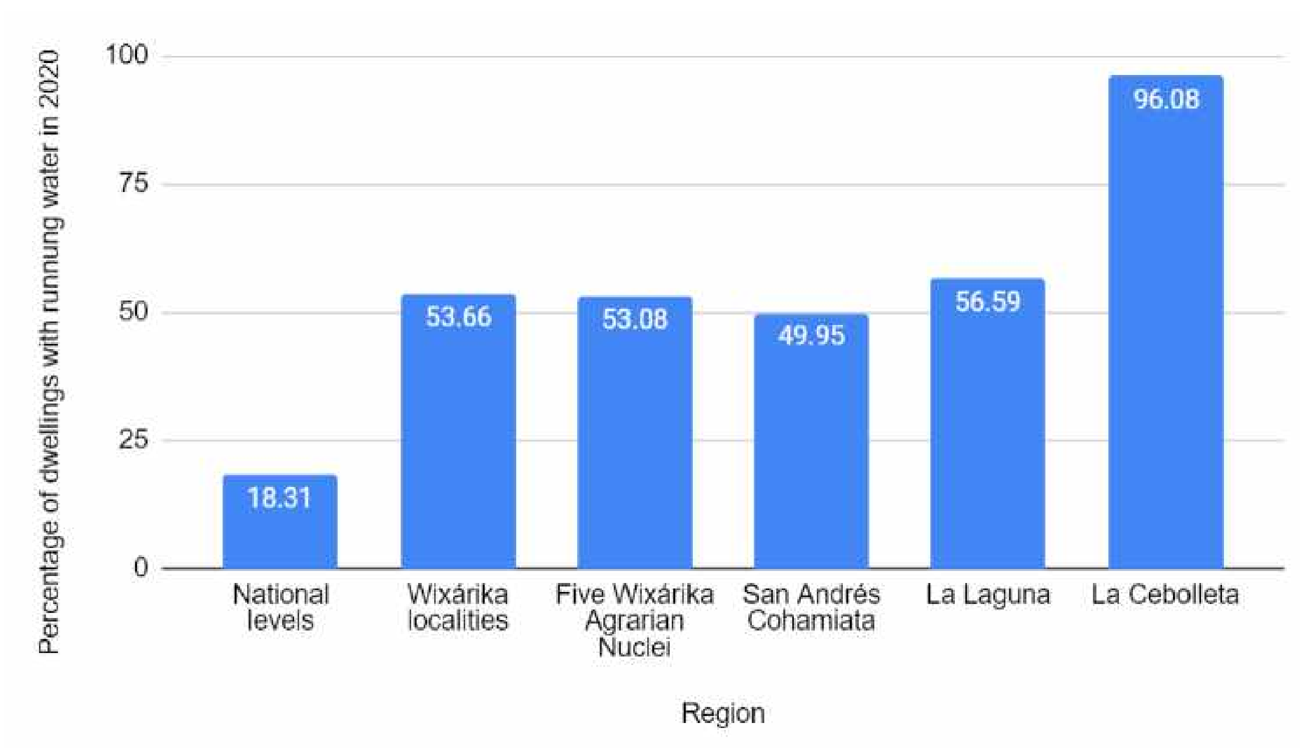


Figure 5. *Average percentages of dwellings that have no access to running water in 2020.*

Climate change impact on the *Wixáritari* people

Future climate change predictions within the San Andrés Cohamiata region are expected to have a deeply detrimental effect on the local population. Overall annual average precipitation levels at a national scale are expected to decrease by 3 to 15% and temperatures are expected to increase by 1.3 to 4.8 Cº by the end of the century (Mercer et al., 2012). Based on figure 6, current climatic classifications include Subtropical Highlands and Humid subtropical within most of the region, Tropical Savannah to the southeast border and a small region of Hot semi-arid climate. However, based on a study by Beck et al. (2018), indicates that according to current climate change weather predictions for 2071 to 2100, 1) Subtropical highland climate will virtually disappear, 2) humid subtropical climate will be displaced northwards, and 3) both tropical savannah and hot semi-arid climates will dramatically increase. These last two climates have a shorter and less intense rainy season, as well as a dryer and hotter summers.

CONABIO (2017), indicates that currently the three municipalities where San Andres Cohamiata agrarian nucleus is located (Mezquitic, Del Nayar and Valparaiso) have a high and very high vulnerability towards drought at a national level. Thus, the climate change predictions for the future are expected to worsen the region's vulnerability index to drought. These effects will compromise the reliability of *Wixárika* communities' current water sources and their agricultural cycles; thus drastically increasing their overall vulnerability.

Currently, the probability of forest fires are low for Valparaiso and the associated risk is medium for Mezquitic, High for Del Nayar. However, with longer dryer seasons and hotter winters, it is expected that both the probability and risk are going to increase significantly by the end of the century (Mercer et al., 2012). Already in the past three years, large forest fires have blazed for weeks over large areas of forest in Mezquitic and El Nayar. In addition to this, the climate change vulnerability for Del Nayar and Mezquitic are high, the degree of resilience for natural disasters is very low, and the social vulnerability index for natural disasters is very high (CENAPRED, 2024).

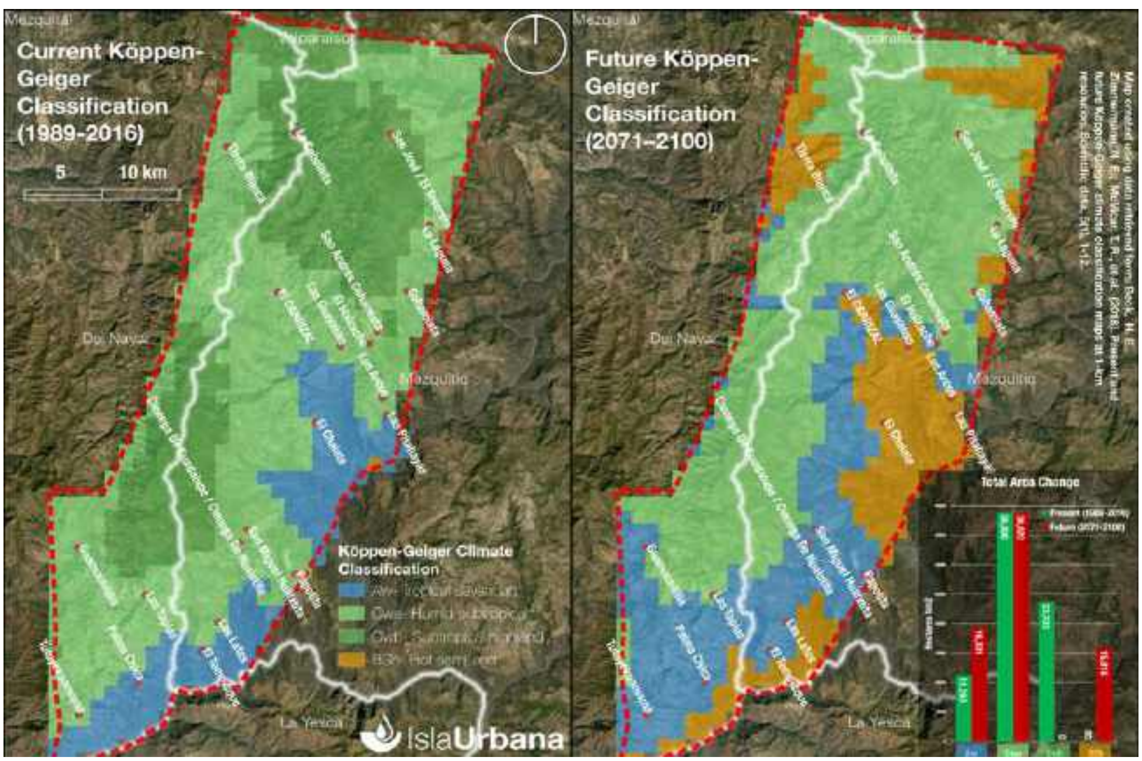


Figure 6. *Actual and future distribution of the Koppen-Geiger Climate classification within the Agrarian Nucleus of San Andrés Cohamiata*

Forest and water challenges

Through a participatory community consultative process conducted between 2022 and 2024, local authorities report that the main problems affecting the forest in the last decade are forest fires (94%), followed by pests, deforestation, overgrazing, and landslides. 100% of the localities have observed erosion (areas without vegetation and soil loss on slopes and in the forest), which they mainly attribute to heavy rains (88%), slope (76%), and agricultural use of the land. 100% of the localities have detected changes in the water coming from the slopes in the last 10 years, the most common being the drying up of springs and the increase of sediment in the water flowing down from the slopes (see Annex 6).

The amount of water used per capita ranges between six and thirteen litres per day, which is insufficient to have a dignified life according to the World Health Organization (WHO), which establishes an ideal of 50 litres per person per day and a minimum of 20 litres per day per capita. The population depends on the water they find in springs and water holes - open pools distributed in the mountainous landscape that depend on the rain recharge to the springs (González-Padrón 2019a) -, seasonal streams, as well as the Santa Clara River, which passes through the town of El Carrizal. Some of these water springs are only used for livestock due to their low quality for human usage, since they are visibly cloudy and/or have a bad taste. The *Wixárika* rely on these dwindling natural water sources for survival. In addition to these main water bodies there are hot springs with salts and high temperatures in the Tesorero and San Miguel Huaixtita ranches, that are scarcely used by the population.

Water is a central part of the *Wixárika* "custom", *El Costumbre*; many specific water holes and springs along the whole *Wixárika* territory (figure 1) are considered to be sacred, and serve as pilgrimage and ceremony sites. The Agrarian Authority (*Comisariado de Bienes Comunales*) considers them of utmost spiritual importance and are devoting great effort to registering their geoposition.
Table 1 shows the number and type of current water sources by location.

Table 1. Current water sources by location

Locality			Number of natural sources from which they obtain water			Number of centralized infrastructure works					Number of SCALL	
	NUMBER OF HOUS	AVERAGE DISTANCE	WATERHOLE (OJO	SPRI	RIV	DRINKING	DRINKING	DIRECT	WATE RE	DA	CO	INH
Ciénega de Guadalupe	103	706	0	2	0	1	0	0	0	0	0	0
Cohamiata	212	418	2	1	0	1	0	0	0	0	0	0
El Carrizal	132	534	2	0	1	1	0	0	0	1	0	1
El Chalate	ND	1316	0	1	0	1	1	0	0	0	0	0
El Huizache	49	ND	2	0	0	0	1	0	0	0	0	0
El Tempizque	32	536	3	0	0	0	1	0	0	0	0	0

Guamuchilillo	70	686	7	0	0	1	0	0	0	0	0	0
La Cebolleta	48	4616	1	0	0	0	0	0	0	0	4	48
La Laguna	111	398	5	1	0	2	0	0	0	0	4	91
Las Latas	36	194	0	5	0	1	0	0	0	0	0	0
Las Guayabas	ND	1138	2	1	0	1	0	0	0	0	0	0
Las Pitayas	125	856	11	0	0	0	0	0	0	0	0	ND
Las Tapias	300	1118	0	0	0	2	0	0	1	0	0	0
Los Arcos	55	4168	3	0	0	0	0	0	0	0	0	0
Los Lobos	50	ND	0	1	ND	ND	ND	ND	ND	ND	0	0
Palma Chica	55	644	0	0	0	1	0	0	0	0	0	0
Popotita	516	780	2	2	0	1	0	0	1	0	0	0
San Andrés Cohamiata	170	856	5	1	0	4	0	0	0	0	0	ND
San José Tesorero	55	650	7	0	0	1	0	0	0	0	0	2
San Miguel Huaixtita	ND	948	1	0	0	6	0	0	0	0	0	0
Tierra Blanca del Chalate	36	396	3	0	0	1	0	1	0	0	0	0
Tierra Blanca de Huaixtita	28	ND	1	0	ND	ND	ND	ND	ND	ND	0	0
Tutu Yekuwamam a	ND	1084	0	0	0	0	1	0	0	0	0	0
Total	**2,228**	**ND**	**57**	**15**	**1**	**25**	**3**	**1**	**2**	**1**	**8**	**142**

Water management and quality

As mentioned above, the limited natural water sources are often of poor quality, mainly because they are in open spaces easily accessible by animals. The Implementing Entity, the Mexican Institute of Water Technology (IMTA) took samples from natural water sources used by the community for consumption in 2022 and 2023. The samples were first analysed in a mobile laboratory for bacteriological parameters, and then sent to the IMTA Water Quality Laboratory in Morelos to analyse the presence of heavy metals. To determine if the water from the supply sources is suitable for human use and consumption, the microbiological parameters Total Coliforms and E. coli were measured. The results were evaluated against the permissible limit established in the official Mexican standard NOM-

127-SSA1-2021, which indicates less than 1.1 MPN/100 mL or undetectable for the E. coli parameter. The results clearly indicate that, in bacteriological terms, the quality of the water from the sampled sources is not compatible with human consumption. The impact on health is significant and most obviously impacts children: infant and child mortality rates are significantly higher than national averages, dysentery being one of the main culprits of this public health crisis.

In terms of water management within households, the main challenge is safe water storage. Families store water in drums, buckets, and only some of them own specialized tanks or cisterns (most of which are RWHS installed in this project). Typically, drinking water is placed in a bucket in the kitchen and taken from there with a glass, but disinfection practices are scarcely known and are not rooted in the families' habits. They drink water from both natural sources and a few existing centralised distribution systems that are rarely reliable. Bathing and washing clothes are usually done directly in the streams and springs, since there is no infrastructure that can meet those ends within households.

Photo 3. *Wixárika woman hauling water.*

Wixaritari women and water

Wixaritari culture is characterised by highly conservative gender roles. Women have little decision-making power within their community governance structures, although in recent years there have been significant advances made when it comes to women's participation in community leadership and governance - structures in which previously only male members of the community participated. An example of this is Paulita Carrillo Carrillo, the current Secretary of the Agrarian Authority of San Andrés, who will be directly supporting and guiding the implementation of this program.

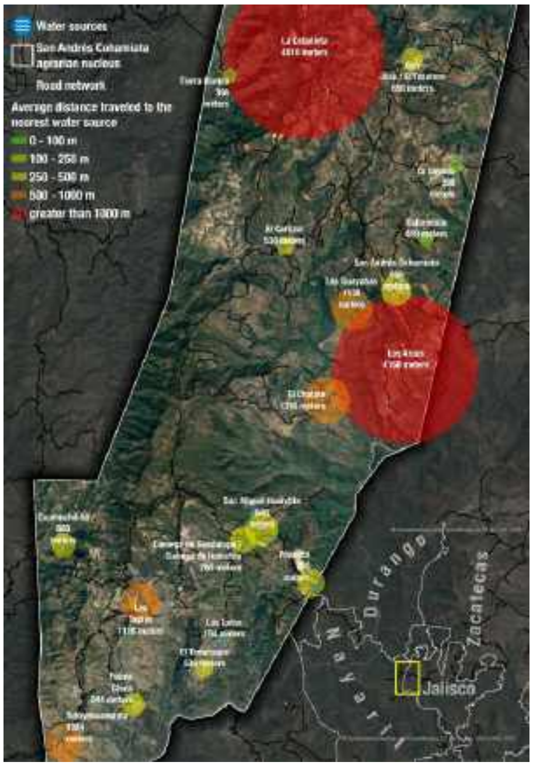
Today, women's roles are still principally ones of child rearing and management of the home; this means they are disproportionately impacted by the increasing water shortages and deficiencies in climate resiliency strategies. 67% of households carry water from natural sources, on average six times a week, to obtain a maximum of 13 litres of water per person per day. In that vast majority of families that rely on water hauling, 68% of the people who haul are women, and 23% are girls and boys under 16 years of age (91% in total for women and children). This work takes them, on average, two hours a day (González-Padrón 2019b).

Hauling is a particularly difficult activity in the mountains: in many locations people need to descend very steep and dangerous paths to look for water in the ravines. These water sources are usually of poor quality because they are in open spaces and with free access to animals (González-Padrón, 2019b).

The average route is 1,104 meters (median: 770 m; mode: 856 m) to bring water to their homes from the nearest water source. Most adults (77%) carry the water on their back, in 20 litre containers, while girls and boys carry 10 or 5 litre containers. Some families have access to wheelbarrows or donkeys that significantly facilitate the task, but hauling capacity is still usually very low. Only 7% of hauling is done in large volumes, by carrying tanks on trucks. 4% of households pay those who have vehicles for this hauling service.

Table 2. Water hauling per household

	Times per week that households haul	Litres they carry each time	Water obtained by hauling (litres per person per day)
Dry season	4.3	41.5	6.9
Rainy season	7.8	69.4	19.3
Annual average	6	55.4	13.1



Women are the most important actors when it comes to water management in homes. They will thus be the drivers of water autonomy and safety improvement, by ensuring that Rainwater Harvesting Systems (RWHS) in homes are properly maintained and water is correctly disinfected for human consumption. As we describe in the Sustainability section below, women will be the driving force behind deepening the communities longer-term adaptive capacities. A fuller gender assessment can be found in Annex 5.

In order to estimate how far the nearest source of water is to each locality, a geospatial analysis was created. Firstly, we generated coordinates for every visible building using publicly available satellite imagery from Google, and (2) calculated the linear distance of every building to the nearest water source (the latter retrieved from fieldwork). Finally, the distance of every building to the nearest water source was averaged for every locality. As the distance does not consider topography or the path from existing road networks or footpaths, the actual walking distance is higher than this estimate (Figure 7).

Figure 7. *Map of three different localities and the distance from each building to the nearest water source.*

Programme Objectives:

The programme's overall objective is to provide universal autonomous, renewable, and adaptive water access to the *Wixárika* people of the 21 communities in the San Andrés Cohamiata region of Mexico. We aim to do this through an innovative combination of Rainwater Harvesting Systems (RWHS), forest regeneration and community capacity building. Ultimately the program seeks to support the *Wixárika* nation to become more adaptive and resilient to the water shortages and desertification that are a direct result of climate change.

Achieving universal sustainable water coverage in the *Wixárika* territory would be a highly significant achievement. The complexities present in this area, which have made conventional water services so prone to failure, also exist in other marginalised communities throughout Mexico and the world. An effective strategy that can establish permanent water access there would be of great relevance if made replicable. This programme therefore seeks not only to supply water to an entire indigenous nation, but aims to systematise a complete methodology, merging technical innovation with social tools and processes, that can be implemented in many more communities across the world.

The program's specific objectives are:

- Increase the amount of drinking water available for 5,100 people
- Increase the adoption of RWHS in 1,000 homes
- Co-design ecological regeneration strategies with the *Wixárika* community to improve soil health and water retention
- Increase the diversity of water sources available to the 21 target communities
- Increase water abundance in existing sources
- Enhance forest and soil health, and biodiversity in target forest areas
- Pilot a new approach to agroforestry practices to enhance food sovereignty and soil health
- Build capacities in the communities to autonomously manage their water needs
- Produce a replicable and scalable model for achieving universal water coverage using RWHS and water-sensitive landscape regeneration for remote indigenous communities across the world.

The program goals are to:

- Install 1,000 Rain Water Harvesting Systems in households, giving approximately 5,100 people access to 20 litres of drinking water every day 9 months of the year. This would mean an additional 19,904,031 to 22,430,281 litres of water every year for the *Wixárika* nation once all RHWS have been installed. Of these 5,1000 people, approximately 52% or 2,658 are women and girls and 45% or 2,286 are children.
- Regenerate 700 hectares of forest to rehydrate the soil, increase biodiversity and capture carbon.
- Train 14 *Wixárika* community members to install RWHS.
- Train 2,000 *Wixárika* community members to use and maintain their RWHS
- 2,000 *Wixárika* community members participating in the implementation of regeneration, conservation and agroforestry practices.
- Pilot an innovative agroforestry approach in 3 hectares of land with 60 families benefiting directly from it.
- Generate a replicable implementation model in the form of a detailed toolkit for universal water coverage.

Programme Components and Financing:

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
Component 1: Establishing rainwater harvesting (RWH) infrastructure for sustainable and autonomous water access.	**1.1** Implementation of 1,000 fully functioning RWHS in households. **1.2** Group and one-on-one training and agreements with users for the correct use and maintenance of the RWHS.	**1.** 1,000 RWHS with 12,000 to 14,000 litres in storage capacity installed and in proper operation throughout San Andrés Cohamiata. **2.** 5,100 beneficiaries with increased access to drinking water, 2,658 of which will be women and girls, and 2,286 of which will be children **3.** Approximately 3,750 beneficiaries trained on the correct use and maintenance of RWHS.	**$4.089.491**
Component 2: Developing and piloting of a community action plan for landscape-scale water management.	**2.1** Community-driven design of a landscape-scale water management and agroforestry strategy for the *Wixárika* region. **2.2.** 2,000 community members (2 per household receiving RWHS) participating in landscape-scale water management. **2.3** 700 forest hectares undergoing regeneration by the community. **2.4** 3 hectares cultivated under innovative agroforestry practices by 60 families.	**1.** Increased local capacities for landscape-scale water management and innovative agroforestry practices. **2.** Full adoption, maintenance and replication of ecosystem restoration activities and agroforestry practices. **3.** Increased quantity of organic matter stored in the soil (measured using the Normalised Difference	**$1.177.877**

		Vegetation Index (NDVI) of the 700 hectares undergoing regeneration. **4.** Increased number of litres of water retained in the soil of the 700 hectares undergoing regeneration.	
Component 3: Developing communities' capacities for sustainable water management.	**3.1** A methodology for community participation and collaboration that ensures community acceptance and ownership of the programme, designed and implemented. **3.2** A learning programme to promote RWH adoption, hygiene, environmental regeneration, and climate change resilience implemented with 3,570 beneficiaries. (70% of programme beneficiaries, discounting 30% for infants and elderly beneficiaries who will not participate in maintenance activities) **3.3** A certification programme for the local Intercultural Teams of 40 people to develop and strengthen local technical and educational facilitation capacities, delivered; supporting team members to become autonomous agents of change in their communities.	1. The *Wixárika* community co-design and co-implement an autonomous water management strategy in their landscape 2. Community-wide awareness and sustainable adoption of RWHS, landscape regeneration, hygiene and safe water management practices. 3. The Intercultural teams of 40 people have the technical know-how and capacity to install and maintain RWHS, regenerate forests and deliver educational activities for their community, scaling adaptive capacities across their communities.	**$821.205**
Component 4: Knowledge management and development	**4.1** Systematised documentation of all technical and	1. Development of an	**$600.634**

of a model for community-led universal water coverage	community processes taking place during the programme, capturing lessons learned, data and all relevant information to be used for the final design of the model. **4.2.** Detailed manual/toolkit for the effective replication of community-led universal water coverage programmes **4.3.** A communications strategy to disseminate the impact of our community-led model for universal water coverage within and outside San Andrés Cohamiata.	integrated model for rainwater harvesting systems and landscape water management, with the potential to be adapted and replicated in diverse rural settings across Mexico and the Global South, effectively addressing water scarcity and improving climate resilience in vulnerable communities.	
5. Project/Programme Execution cost			**$684.057**
6. Total Project/Programme Cost			**$7.373.264**
7. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			**$626.727**
Amount of Financing Requested			**$7.999.991**

Projected Calendar:

Milestones	Expected Dates
Start of program/Programme Implementation	July 2025
Mid-term Review (if planned)	July 2027
program/Programme Closing	January 2029
Terminal Evaluation	July 2029

A. Describe the program/programme components, particularly focusing on the concrete adaptation activities of the program, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual programs will contribute to the overall increase in resilience.

Ha Ta Tukari's ongoing efforts in developing and submitting the Concept Note from 2022 to 2024 enabled us to complete the first component of the initial proposal: "Participatory Community Water Access Diagnostics for the San Andrés Cohamiata Region Communities." This foundational work sets the stage for all remaining tasks, which focus on scaling our adaptation impact. With this component now complete and detailed in the report shown in Annex 11, the project is organised into four components: Rainwater Harvesting Systems' installation, landscape water management and regeneration, capacity building, and knowledge management.

Components 3 and 4 are cross-cutting and have an impact throughout programme implementation. Capacity Building and community agreements (3) especially are threaded throughout Components 1 and 2 as their success depends on the Wixárika nation truly adopting, implementing and maintaining all the water management infrastructure and practices they promote. There are capacity building activities that appear in both components 1 and 2, being driven by component 3.
This is what makes Ha Ta Tukari unique, the fact that this is not a programme that is being brought to the *Wixárika* people from the outside, rather it is a truly Intercultural effort, with co-design and co-implementation at its core.

Component 1: Establishing rainwater harvesting (RWH) infrastructure for sustainable and autonomous water access.

As climate change, drought and desertification challenges deepen, there is little that the Wixárika people can do but walk further than they already do in search of water and increase the overexploitation of existing water sources and springs. By building a broad, decentralised infrastructure of multiple, independent Rainwater Harvesting Systems, families can count on clean, stored water, directly in each home. The distributed and autonomous nature of each system means that any mechanical or physical failure or damage to any individual system will not affect the rest, which gives great resilience to the whole. By virtue of this decentralisation, RWHS directly address the AF strategic outcome 1, since they provide completely independent infrastructure to each building and family, and reduce their exposure to threats that might affect the whole community. This component also addresses outcome 4 through the development of infrastructure assets that increase adaptive capacity and resilience in the community. Lastly, this component supports Output 8 through the scaling-up and development of RWHS systems throughout the community, offering an innovative technology that supports adaptation resilience for a unique indigenous community in one of the most isolated and challenging regions in the world.

The program will provide 1,000 RWHS in all 21 towns and villages that make up San Andrés Cohamiata, with a focus on homes. Each system includes a tank of between 12,000 and 14,000-litre capacity, and colloidal silver to purify the collected water for human consumption. The existence of this distributed infrastructure of rainwater tanks will produce an enormous increase in available water, whose quality can be secured much more readily than that of the existing open natural water springs from which the community currently obtains most of its water.

The ability to store water during rainfall for future use significantly enhances the Wixárika community's capacity to adapt to the increased variability in precipitation rates and timeframes caused by climate change. Additionally, this network of RWHS reduces the demand on existing natural water holes and springs in the area, lessening their over-exploitation and allowing them to maintain a greater volume of water when needed. By decreasing the strain on these sources, more water remains in the landscape, reducing the number of people drawing from these natural resources and easing the pressure on the fragile riparian ecosystems surrounding them.

Our work has focused on the development of technologies and implementation models that allow the Rainwater Harvesting Systems that achieve long-term adoption and appropriation by their users. The models we have developed involve carefully designed technology in the form of robust and durable physical components, combined with user training, local technical capacity building, production of didactic materials, and long term support, in order to leave communities with a deep appropriation of rainwater harvesting practices. Follow-up and long term monitoring have shown robust adoption of the systems many years after projects have ended.

Photo 4. *Wixárika family and their RWHS*

Main objective: Build decentralised infrastructure for autonomous and safe water provision in households across the 21 communities of San Andres Cohamita.

Concrete outputs:

1.1 Implementation of 1,000 fully functioning RWHS in households.
1.2 Group and one-on-one training and agreements with approximately 3,570 users for the correct use and maintenance of the RWHS (this represents 70% of programme beneficiaries, discounting 30% for infants and elderly beneficiaries who will not participate in maintenance activities).

Expected Outcomes:

1. 1,000 RWHS with 12,000,000 to 14,000,000 litres in storage capacity installed and in proper operation throughout San Andrés Cohamiata.
2. 5,100 beneficiaries with increased access to drinking water, 2,658 of which will be women and girls and 2,286 of which will be children.

3. Approximately 3,570 beneficiaries trained on the correct use and maintenance of RWHS.

Alignment with Adaptation Fund objectives:
By virtue of the decentralised nature of this component's design, RWHS directly address the AF strategic outcome 1. *Reduced exposure to climate-related hazards and threats*, since they provide completely independent infrastructure to each building and family, and reduce their exposure to threats that might affect the whole community. This component also addresses the outcome 4. *Increased adaptive capacity within relevant development sector services and infrastructure assets* through the development of infrastructure assets that increase adaptive capacity and resilience in the community. Lastly, this component supports Output 8. *Support the development and diffusion of innovative adaptation practices, tools and technologies* through the scaling-up and development of RWHS systems throughout the community, offering an innovative technology that can be replicated to move towards successful climate change adaptation in the region.

Related activities:

- **Logistics Preparation for the implementation phase / creation of Operation Centres:** the installation work will be carried out from two strategic operation centres that will include a warehouse to store materials and tools, an office space, 1 to 2 pick-up trucks, a kitchen and bathrooms. Capacity building activities will be held there in the first months of the project. The first 6 months of the programme will focus on building and kickstarting these two operation centres.

- **Community meetings with traditional, communal, and religious authorities, as well as end-users:** meetings with local authorities and inhabitants to define the nature of new partnerships (and each party's respective roles and responsibilities), present the Project's Operating Rules and conditions, and introduce the practice of RWH and the system's operation and maintenance.

- **Creation of Community Governance Committees and co-participation agreements with local communities -** *this activity appears in Components 2 and 3 since it is a fundamental cornerstone of all programme activities and impact* **-** A series of meetings designed to inform and establish terms of participation for beneficiaries throughout the entire project. Building on and ensuring community buy-in and ownership of the programme's objectives and activities. The Ha Ta Tukari team has 13 years of experience of building these kinds of relationships and agreements in the *Wixárika* region. Community members' input is essential to the project's success, as much of the work, especially that of Component 2, will be carried out by the beneficiaries themselves (further details will be provided in the Component 2 and Cost Effectiveness sections).

- **Technical visits to installation sites to determine feasibility and specifications for each system, as well as beneficiary commitments regarding their operation and maintenance, include:** analysing each building's characteristics, evaluating feasibility, creating a tailored list of materials, presenting conditions for inclusion in the project, and reaching agreements with beneficiaries. These agreements cover space requirements for the RWHS, necessary adjustments for installation, the beneficiaries' commitment to proper use and maintenance, and co-participation in providing food and lodging for the installation team.

- **Programming of rainwater harvesting system installations in homes:** design of the implementation route, notification of the installation dates and timelines to beneficiaries, preparation of the materials for each installation, organising the RWHS installation teams.

- **Installation of 1,000 RWH systems in homes:** The installation of a RWH system involves several parts, the principal ones being: gutters; pipes/downspouts; first flush systems and leaf screens; and cisterns. Installation of the cistern itself is generally the most complex and time consuming part of the process, taking approximately 3 hours in the case of the geomembrane-type tanks, and about 8 hours of work plus 24 hours of curing time for the cast concrete-type tanks (see below for more technical specifications). The remaining components generally take a total of 2-4 hours to install. This all means that a well trained and equipped crew of installers will generally install 1 full RWH system per day, with one sub-team installing the tank while another install gutters and all other components. Principal challenges in installing RWH systems in the context of the Sierra involve ensuring that all the materials and tools can be delivered to each house, ensuring that all prep-work is completed by the family (e.g. levelling the ground where the cistern will be placed), and the need for near-total self-sufficiency by the team given there are no hardware stores to get missing parts, or even electricity in many of the homes and villages.

- **One-on-one training, and other knowledge-sharing activities to develop and strengthen local RWHS installation capacities:** technical training for each family on correct use and maintenance of the RWH once the systems are installed and fully operating. Training on the dosage and use of colloidal silver for water purification (brand name Microdyn). Delivery of didactic materials about RWHS, their use and maintenance, and water purification with colloidal silver. Women will be a key beneficiary of these given their key role in household management and child rearing. All training will be designed with a gender perspective, taking into account gender dynamics and local realities.

- **Monitoring and evaluation of the use and maintenance of community systems:** yearly follow-up of previously installed systems, during rainy months, to reinforce training, clear any doubts, make repairs to faulty systems and components, and monitor adoption. Monitoring and evaluation of the use and maintenance of the RWHS is ideally carried out during the rainy months, since this is when the systems are actively filling with water, and it is when they require more active management by their users. It is during these months that the way in which they are being used can be directly determined by the monitoring team, and any errors or misuse can be observed and corrected.

Description of the technologies

Successfully achieving Universal Drinking Water Access in the region will depend in large part on the effectiveness of the Rainwater Harvesting component, both in terms of technical functionality, and of adoption by the community. The majority of programme resources will be invested in this Component. We have put a great amount of thought, research, experimentation, and analysis into the selection of an optimal solution (see Annex 3).

The major considerations at play in selecting a RWH technology for the Sierra are listed below. Different potential RWH technologies have strengths and weaknesses in the face of these criteria. Selection of an optimal model means weighing and comparing relative pros and cons.

1. Storage Capacity: The larger the tank, the more water you can store for the dry season. However, a larger volume requires a bigger rooftop area to be filled to near capacity with rainwater. Smaller dwellings would have the same rainwater harvesting potential with a smaller tank as long as no water overflows.
2. Transportability/logistics: The region is very remote, the villages and homes are highly scattered on a very large, extremely mountainous landscape, with few and poor roads which makes bringing heavy or very large materials an almost impossible challenge.
3. Durability/Sustainability: The infrastructure we will build should be able to function for decades with locally-led repair and maintenance.
4. Adoptability: The technology should be understandable, acceptable, adaptable, and repairable, by the local population. The programme should be implemented with as much participation as possible by the communities themselves.

5. Water Quality: What processes or technologies are needed for achieving the desired water quality within realistic cost and complexity constraints.
6. Scaling: What is viable for scaling and replicating in other communities, regions, states, countries with similar conditions.

Rainwater Harvesting Systems in buildings: Ha Ta Tukari has already achieved near universal coverage in two of the villages of San Andrés Cohamiata, and between 2022 an 2024 has installed Rainwater Harvesting Systems in every school and clinic in the area. The current proposal would cover the implementation of RWHS for all remaining households in this area, as well as the few community buildings left to equip with RWHS.

Rainwater Harvesting Systems in households: RWHS are central to our strategy for achieving water access in the *Wixárika* Mountains because this form of infrastructure can be implemented in homes that are too scattered for centralised systems to reach; because they take advantage of the only water source that already reaches every house naturally; because they are very effective and simple to use; and because the capacity to store water in the homes - which the rainwater tanks provide - gives greatly increased resilience to families and communities, allowing water from more abundant moments to be saved for dryer periods. This is of great importance in the present context of increased droughts alternating with high intensity rain events, which are the anticipated and already apparent tendencies of climate change in northwestern Mexico.

The systems that we use capture the rainwater that flows off the house's roofs usually made of slab, metal or plastic sheet, and channel it via gutters and pipes, passing through a leaf-screen (stainless steel 2x2mm mesh). Subsequently, the water is conveyed through a first flush diverter that diverts the first 0.5-1.5mm or 0.5-1.5 L/m2 of precipitation from each rain event, eliminating diverse pollutants in the water, and is then introduced into a storage tank. Within this tank, a calm inlet allows incoming water to fill the tank from the bottom without stirring up settled sediments.

Two storage tank models will be used in this project: geomembrane tanks made from HDPE (High Density Polyethylene), and Concrete tanks. Their capacities range from 12,000 to 14,000 litres, depending on the type of system. To extract the water, a hose is connected to direct the water to the place of use (Figure 8 and 9, Annex 2). Final treatment of the water can be achieved with colloidal silver (brand name Microdyn), that will be distributed and also available in the small stores in the region. These systems capture approximately 19,900 to 22,500 litres of rainwater per year in homes, enough to provide families with an average of 68 litres of drinking water at home per day, equivalent to 3 or more daily trips to streams and water holes carrying 20+ kilograms of water each time.

Figure 8. *Concrete cistern RWH system render*

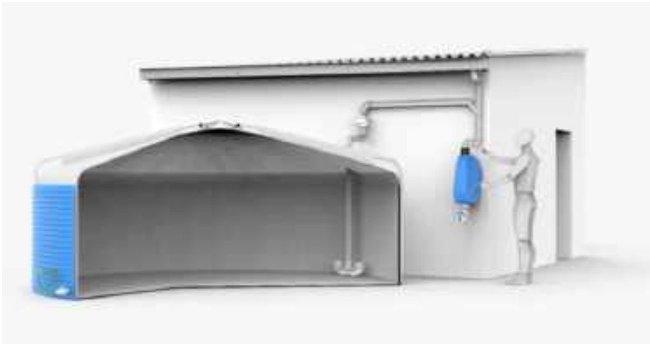


Figure 9. *Geomembrane cistern RWH system render*

Photo 5. *RWH system with metal sheet protection*

New Developments in Concrete Tanks

The concrete tanks we propose working with are approximately 12,000 litres in volume (2.8 m diameter * 2 m height) with solid 4” thick walls. They are cast in concrete reinforced with steel mesh. We have recently begun working with a novel construction method for building cast-concrete tanks. This method, which involves a combination of specially designed moulds, thoughtful use of accelerants and additives to the concrete mix, and a precise implementation process, significantly mitigates several of the key difficulties inherent in working with concrete tanks, as detailed below:

Table 3. Concrete tank comparison

Challenge	Conventional Concrete Tanks	New Technology Concrete Tanks
- Takes a long time to build	5-10 days from start to finish.	1.5 - 3 days from start to finish.
- **Difficult quality control results in leaks**	Difficult to ensure consistency in cement mixing, proportions, application times, technique, etc… requires highly skilled and trained technicians present at all times. Failures in consistency/quality control can cause frequent leaks.	The implementation system allows for tight control of all parts of the process. Cement mix is consistent, proportions can be kept exact, application method results in a solid monolithic structure poured in one session, basically eliminating fail points and potential leaks.
- Highly labour intensive	3-5 days of hard physical labour by a crew of 4-6 people	8 hours of medium-hard physical labour by a crew of 4-6
- Transport of heavy materials	Difficult. Needs 8-10 tons of materials delivered to each tank site.	Not affected for better or worse. Problem remains the same.

As the table shows, this novel technology significantly improves on conventional concrete tanks on 3 of the 4 principal issues we consider. This makes them far more viable than conventional concrete tanks, effectively putting them back on the table vis-à-vis geomembrane Tanks.

Given the vast, mountainous areas and the necessity for efficient implementation and transportability under very challenging conditions, we will use a combination of the two tank technologies. **To ensure**

we provide high-quality storage tanks to all 1,000 households, we plan to use a 50%-50% proportion of both technologies, depending on accessibility and other factors we will be able to assess once implementation begins. Concrete tanks are highly durable, but their large-scale construction is impractical in areas with no road access. In these homes and communities, we will use geomembrane tanks, which have proven effective and viable in the Sierra and offer the best solution for reaching inaccessible communities (see Annex 2).

Photo 6. *A Concrete tank, using the same technology as we propose, installed in the Cocachi community in the remote Bolivian mountains*

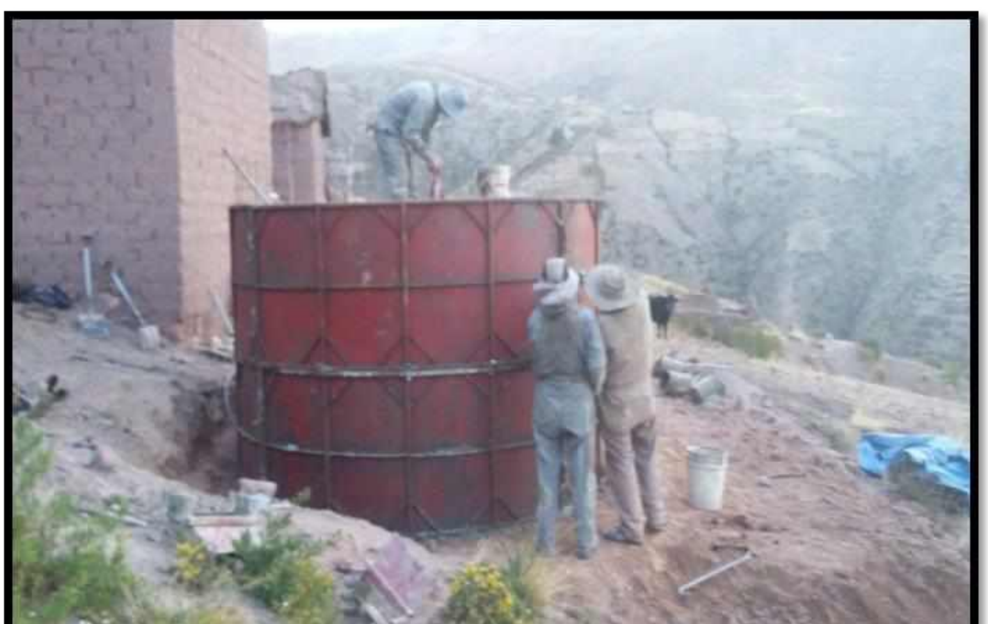


Photo 7. *Concrete storage tank require a special mold with a tailored design to this technology, the program proposes creating its own molds for the sustainability of the project*

Photo 8. *The Wixárika intercultural team install a RWHS in the community*

We do not seek to simply install RHW technologies, but rather to work closely with *Wixárika* communities to reach real water autonomy. To achieve this, we only work with communities who explicitly request it and, most importantly, with technicians and promoters who are trained *Wixáritari* that live in the Sierra and are employed by Lluvia Para Todos. Our work is based on building long-term relationships of trust and long-lasting local capacities, and has involved developing methods and strategies unique to this program and distinct from all the others Isla Urbana, as an organisation, has carried out.

These RWH Systems will provide about 67 to 75% of the total water-in-the-home target. The rest will come from current-use water sources. This means that the springs and water holes that currently supply the population will continue being necessary, however the programme will allow for a very large reduction in the volumes of water extracted from them. This is good news for the fragile basin ecosystems and the forests in the region. Nevertheless, the need to continue using these natural sources of water and to adapt to the impacts of climate change in a region struck by growing desertification are the central reasons that the program integrates landscape-scale forest and water management: with the current rate of erosion and soil loss, the landscape and its springs and waterholes are drying up. Only through a well-designed community action plan for landscape-scale water management can these water sources be preserved and enhanced.

Component 2: Developing and piloting of a community action plan for landscape-scale water management and regeneration.

The *Wixárika* region is experiencing increasing drought conditions, forest fires, and land changes that exacerbate the degradation of local soils and ecosystems. This is a grave and highly concerning problem because the rocky terrain with thin soils and steep slopes of the *Wixárika* Sierra is already highly vulnerable to desertification and erosion. Once degraded, the land in this area is very difficult to regenerate. Desertification is becoming one of the main issues for the *Wixárika* community, as it not only affects food availability but also reduces overall humidity and alters rainfall patterns that impact so many aspects of their lives.

As climate change impacts the areas where we focus our work, integrating additional water-related practices into our projects becomes increasingly important. To enhance resilience at an ecosystem level and adapt to changing rainfall patterns and climate conditions, retaining as much water as possible within the region's watersheds and soils is essential. Water retention and infiltration can increase the landscape's capacity to sustain vegetation cover and extend the flow and duration of seasonal streams and springs. Increased vegetation and humidity in the landscape can potentially help maintain or increase local rainfall. All these outcomes aim to reduce the exposure of the *Wixárika* to climate-related threats (AF strategic outcome 1) by regenerating the landscape and rebuilding its capacity to retain humidity. This involves working with volunteer forestry teams and community members to engage in activities that promote the productive regeneration of their landscape.

Main objective: To combat desertification by increasing water retention and infiltration in the landscape, enhancing biomass and vegetation cover, and reducing soil erosion through an innovative community action plan.

Concrete outputs:
2.1 Community-driven design of a landscape-scale water management and agroforestry strategy for the *Wixárika* region.
2.2. 2,000 community members (2 per household receiving RWHS) participating in landscape-scale water management.
2.3. 700 forest hectares undergoing regeneration by community.
2.4 3 hectares cultivated under innovative agroforestry practices by 60 families.

Expected outcomes:
1. Increased local capacities for landscape-scale water management and innovative agroforestry practices.
2. Full adoption, maintenance and replication of ecosystem restoration activities and agroforestry practices.
3. Increased quantity of organic matter stored in the soil (measured using the Normalised Difference Vegetation Index, NDVI[2]) of the 700 hectares undergoing regeneration.
4. Increased number of litres of water retained in the soil of the 700 hectares undergoing regeneration.

Alignment with Adaptation Fund objectives:
All of these outcomes aim at reducing the exposure of the *Wixárika* to climate-related threats aligning with the AF strategic outcome 1. *Reduced exposure to climate-related hazards and threats*. Most aligned is Outcome 5: *Increased ecosystem resilience in response to climate change and variability-induced stress* as this component focuses on regenerating the landscape and re-building its capacity

[2] Over the last decade, the NDVI has proven extremely useful in predicting herbivore and non-herbivore distribution, abundance and life history traits in space and time.

to retain humidity which can help ecosystems build resilience in the face of forest fires, desertification and loss of water sources brought about by climate change. Increased vegetation and humidity in the landscape can also potentially help increase local rainfall.
The community adaptation plan targets Outcome 7 '*Improved policies and regulations that promote and enforce resilience measures'*, in which new planning and policies are created with community input to promote and work towards resilience. The implementation and execution of this plan works towards Outcome 3. *Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level,* by ensuring community participation and ownership throughout the process.

Related activities:

- **Community Meetings with Authorities and Beneficiaries:** Engage with traditional, community, and religious leaders, along with residents, to present the project, define co-participation agreements, and clarify each participant's role and involvement *(again, this connects to Components 1 and 3 as the programme's components will be presented as one to community authorities)*
- **Creation of the Ha Ta Tukari Governance Committee- co-design of regeneration activities:** Establish roles and responsibilities, design a programme for specialised teams to lead landscape regeneration activities, and plan evaluation efforts and annual results reports. (See Section III.A. for a full explanation of the Committee's role.)
- **Capacity Building for Hydroforestry Teams:** Create and define the roles of specialised teams focused on socio-educational and technical aspects of landscape regenerations. Training will cover regeneration techniques, soil identification, safety protocols, topographic surveys, and forest fire management.
- **Ongoing Training and Workshops on Successional Agroforestry Systems (SAFS)**, hydrological landscape design, and water storage techniques. Through participatory workshops, develop strategies tailored to each area's needs, ensuring effective SAFS implementation.
- **Landscape Rehydration Strategy Implementation:** Co-design technical and participatory strategies for landscape regeneration and rehydration, and develop a participatory action plan. Carry out collective landscape regeneration activities involving both specialised teams and RWHS component (1) beneficiaries. Establish demonstration plots based on SAFS to showcase agroforestry practices.
- **Carbon Bond Programme for the Sustainability of the community's hydroforestry work:** The programme intends to explore the possibility of integrating the results of this Component into a carbon bond programme to ensure long-term financial sustainability. This process would focus on monitoring, evaluating, and reporting carbon retention in the soil, with the aim of making the work feasible in the longer term, enabling replication and further scaling after the life of the programme. We have budgeted for an expert to advise on the potential of this being integrated into the programme once this Component is up and running.
- **Monitoring and Evaluation:** Track the progress of forest regeneration and SAFS activities using tools that are user-friendly (it will be participating *Wixárika* who will be doing the data collection) but that maintain scientific rigour. Conduct annual evaluations, and end-of-year meetings with the Hydroforestry Committee to assess achievements and set future goals. Prepare annual evaluation reports detailing results, activities, and recommendations for future improvements (see Monitoring and Evaluation section for further details of indicators etc).

Integrated hydrological land management methods

How can we support the *Wixárika* nation to store water? Cisterns/tanks are the most expensive type of storage, but they keep water of better quality and availability for human consumption and are the most appropriate for capturing rainwater near homes. However it is essential to generate a shared understanding of how the landscape plays a crucial role in terms of water storage, and generate new local capacities to understand and implement landscape rehydration processes. Water in the landscape can be stored in:

- The soil
- Biological resources (living organisms)
- Surface storage (water bodies)
- Built cisterns/tanks

The key to this component is the implementation of features that slow the speed of surface water flows, promote infiltration, catch soil, and retain moisture. These features include swales, keyline and/or contour line trenches and slits, revegetation/forestation along contours, ponds and micro dams, gabions, and other subtle changes in the land that prevent the fast erosion of soils and allow water more time to permeate into the ground. It also involves working with the local farmers to implement similar methods that allow their cultivated fields to retain soil more effectively, since the steep grades and shallow soils of the Sierra mean that agricultural land generally becomes significantly depleted within a few years.

Land management based on practices that seek to increase organic carbon storage in the soil not only contributes greatly to carbon sequestration as a strategy to reduce greenhouse gases but also contributes to adaptability to Climate Change in forest landscapes. Because soils with little organic carbon are *dehydrated soils* with little capacity for storing water and nutrients, for recharging aquifers, and, as a consequence, they are soils devoid of life and biological fertility. Soils with high amounts of organic carbon are hydrated soils, of high water storage capacity, aquifer recharge and high biological activity and fertility that allows the support of different biological systems.

To integrate these interventions and create a healthy landscape that can also sustain food sovereignty, we also plan to pilot Successional Agroforestry Systems (SAFS): a design methodology that promotes the natural replacement of plant species over time in healthy ecosystems (natural succession). This type of intervention produces abundant food for humans and animals, wood for different uses, as well as biomass that is reincorporated into the soil, favouring soil health and therefore its retention and infiltration capacity. These actions contribute to rehydration at the landscape scale, while forming productive and resilient "micro-ecosystems". The actions mimic the natural processes of biodiverse ecosystems and human intervention serves as the accelerating and optimising element of the regeneration process. The potential of these interventions has already been analysed in the *Wixárika* Sierra (see figure 10).

Photos 9 and 10. *Images of innovative agroforestry system implemented in Tepoztlan in the state of Morelos, Mexico, 2023*

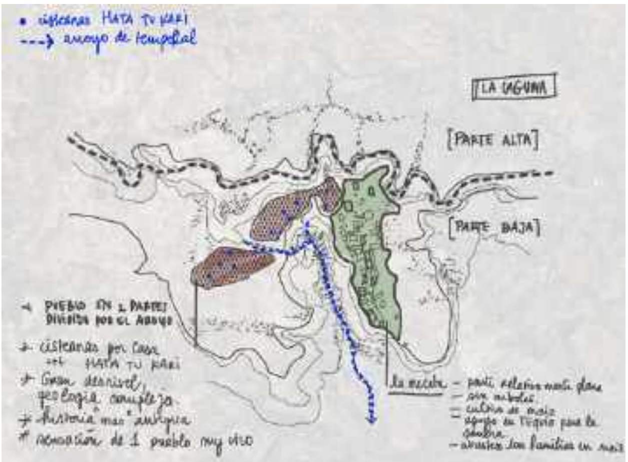


Figure 10. *Image of the initial landscape analysis of la Laguna town, Sierra Wixárika, 2022*
Photo 11. *Successional agroforestry system by TNT in Reserva El Peñon, Valle de Bravo, Mexico*

The choice to demonstrate SAFS (Successional Agroforestry Systems) in three 1-hectare plots, each subdivided into 20 parcels of 500 m² each (total of 60 parcels), is not an arbitrary decision; *Wixárika* agricultural practices are deeply spiritual, involving not just cultivation but also rituals, prayers, and offerings for specific crops like tobacco and corn, depending on the season. Transitioning to new agricultural methods on a large scale poses both technical and cultural challenges, as it intrudes upon these traditional practices.

Following advice from SAFS expert Namaste Messerschmidt, we decided against starting with a large area requiring collective management. Instead, we will use smaller, manageable plots to encourage individual experimentation with crop diversity and alternative agricultural practices. This approach allows interested parties to adopt SAFS practices in a manageable context, facilitating farmer-to-farmer knowledge sharing and providing inspiration through individual plots. The process will focus on integrating modern agricultural techniques with traditional methodologies, fostering awareness and training in a model that harmonises forest and agricultural relationships, balances abundance with monoculture, and blends new planting conventions with ancestral practices.

This work requires significant community participation and organisation, which will be a central focus of the programme. Though challenging, it is crucial for enhancing the adaptability and resilience of *Wixárika* communities. **Their best chance to prevent land degradation lies in their ability to organise and collaborate in protecting their lands from erosion and deforestation.**

This programme component will be implemented in 2-3 locations, where the landscape conditions are favourable, and local villages are both interested and well-organised. 700 hectares of forest will be regenerated for water retention and carbon capture, and a further 3 hectares used to pilot the SAFS.

It will involve collaboration with experienced landscape management experts and the development of strong community organisation efforts. This piece of the work serves as a critical pilot stage for scaling and extending the initiative across the broader region.

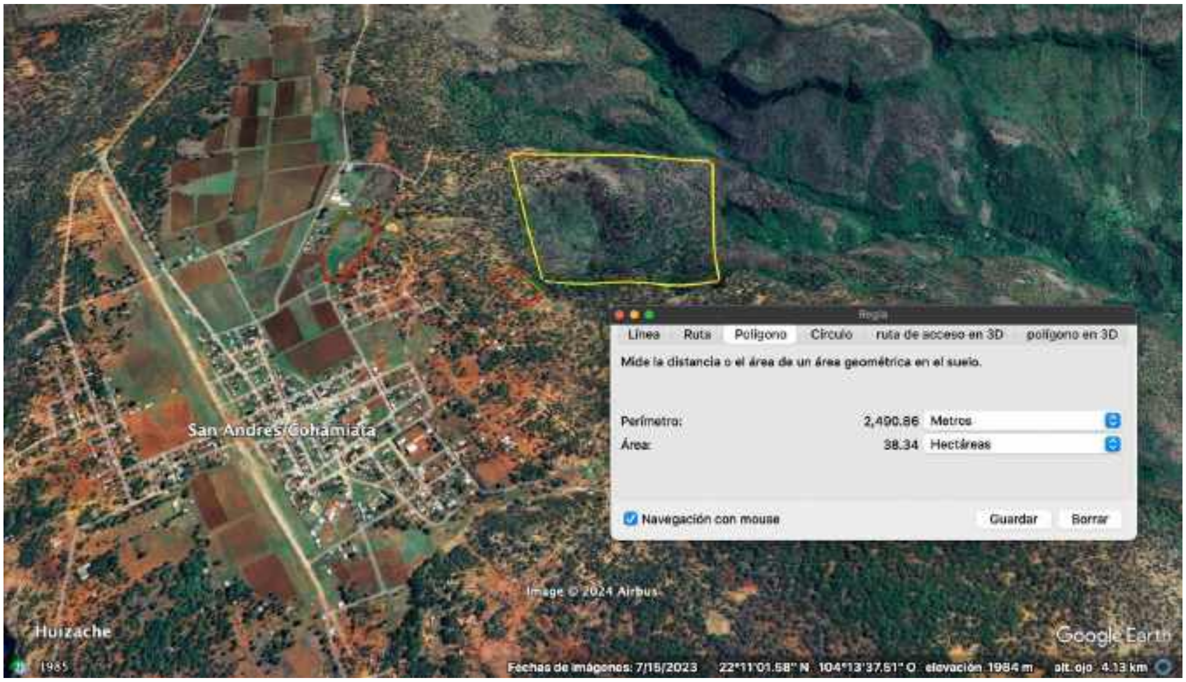


Figure 11. *Satellite image of Proposed area for regeneration*

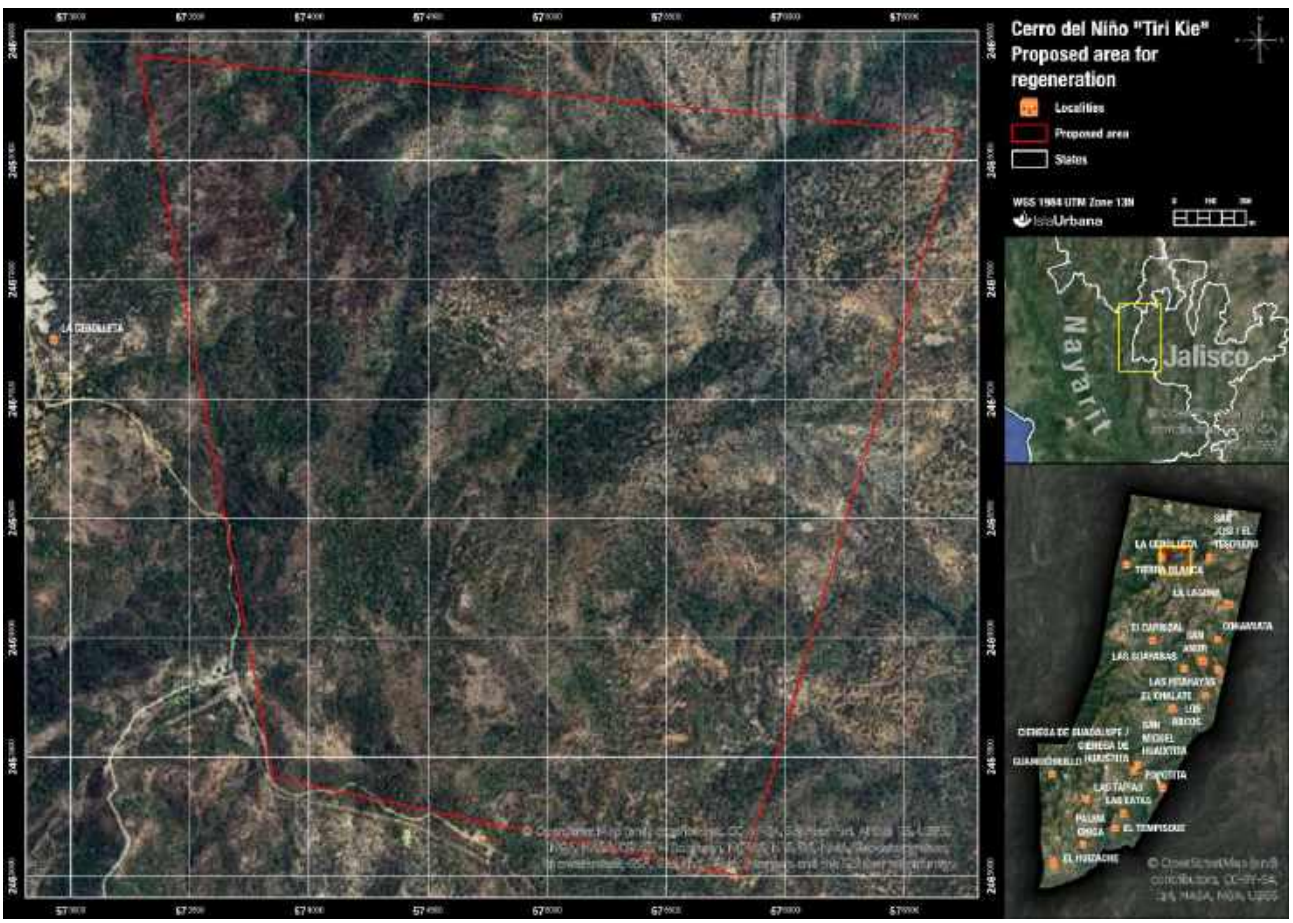


Figure 12. *Proposed area for regeneration at Cerro del Niño or Tiri Kie*

Component 3: Developing communities' capacities for sustainable water management.

This component provides a platform from which to strengthen awareness and ownership of adaptation and climate risk reduction processes for the *Wixárika* community (AF's Outcome 3) and fundamentally underpins the overall programme objective of ensuring local ownership of adaptation solutions.

Instead of relying on external technicians to install RWHS and develop landscape-scale water management plans, the programme will focus on expanding and empowering an existing *Wixárika* team. This approach ensures that as much of the work in organising and implementing the technologies and interventions of Components 1 and 2 is done by the communities themselves. External expertise will be brought in as needed, promoting intercultural knowledge-sharing and enhancing local capacities for the effective replication, installation, use, and maintenance of eco-technologies, as well as the design and execution of landscape-scale water and soil retention projects. We will also work with each village to establish community co-participation agreements and develop the skills necessary for the long-term maintenance and sustainability of these technologies.

This component involves two key initiatives: first, expanding and training the specialised teams of *Wixárika* technicians who will build the infrastructure and teach every family how to operate and maintain their RWHS; second, implementing a comprehensive education programme in every school, ensuring that teachers and students are taught RWHS use, safe drinking water practices, and landscape water management principles, so that every *Wixárika* child learns these skills during their school years.

This extensive effort to build capacity and knowledge in water management across the population will greatly enhance *Wixárika* resilience and adaptability in the face of changing climate and water access conditions. It will also strengthen their ability to respond to and mitigate the impacts of climate-related events, such as forest fires, floods, and rain variability, ultimately reducing their exposure to climate risks.

Main objective: To provide the *Wixárika* community with the tools, technologies and techniques to implement and manage their autonomous water systems and landscape regeneration strategies; ensuring the expansion and sustainability of the programme's overall impact through the fostering of community ownership.

Concrete outputs:

1. A methodology for community participation and collaboration that ensures community acceptance and ownership of the programme, designed and implemented.
2. A learning programme to promote RWH adoption, hygiene, environmental regeneration, and climate change resilience implemented with 3,570 beneficiaries (70% of programme beneficiaries, discounting 30% for infants and elderly beneficiaries who will not participate in maintenance activities)
3. A certification programme for the local Intercultural Teams of 40 people to develop and strengthen local technical and capacity building capacities, delivered; supporting team members to become autonomous agents of change in their communities.

Expected outcomes:

4. The *Wixárika* community co-design and co-implement an autonomous water management strategy in their landscape

5. Community-wide awareness and sustainable adoption of RWHS, landscape regeneration, hygiene and safe water management practices.
6. The Intercultural teams of 40 people have the technical know-how and capacity to install and maintain RWHS, regenerate forests and deliver educational activities for their community, scaling adaptive capacities across their communities.

Alignment with Adaptation Fund objectives:
All of these outcomes are aligned with the AF's **Outcome 3** 'Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level' and ***Output 3.1***: Targeted population groups participating in adaptation and risk reduction awareness activities by ensuring that the Percentage of targeted population applying appropriate adaptation responses increases across the *Wixárika* nation. It will also impact **3.2.2** by impacting the number of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders.

Related activities:

Design and produce participatory tools and didactic materials: design manuals, guides, video tutorials, infographics, educational stories, board games, etc., appropriate to the local sociocultural context, which is both bilingual and intercultural, based on the notion of community resilience against climate change (a lot of these materials will be co-created with beneficiaries). Piloting and adjustments will be done during the first months of the project, and the final version will be produced for distribution (digital and printed).

Expand and Train the *Wixárika* Team: Announce an open call across San Andrés Cohamiata to recruit and reconfigure an Intercultural Team, with a focus on including women. Develop a range of skills, including communication, organisation, systemic thinking, vehicle management, basic mechanics, and the use of platforms and electronic devices. Continuously assess the team's ability to implement project activities.

Design and Implement a Certification Programme: Create procedure manuals for each role (Hydroforestry team, RWH technicians, education facilitators) that include toolboxes with data collection instruments, community agreements, registration formats, installation receipts, and necessary equipment. Train and certify the Intercultural Team to facilitate community agreements, capacity development, eco-technology installation, and land regeneration. The training will involve theoretical and practical workshops, including on-site practice and evaluation. Team members will be certified once they can perform their tasks independently.

Establish Community Agreements: Develop and formalise Community Agreements for water management, defining roles and participation for each set of stakeholders. Build an organisational structure within the community to ensure effective project implementation (the Governance Committee). Promote a unified understanding of community resilience in the face of climate change. Finalise agreements with community signatures.

Train All Beneficiaries: Conduct training and knowledge exchange activities (workshops, meetings, etc.). Train households and local committees in the use and maintenance of RWHS, and educate families, students, and teachers on hygiene and water purification. Ensure the community is able to implement, install, operate, and maintain RWH systems and hydroforestry techniques.

Create Community Art: Facilitate the creation of murals, songs, videos, and photographs through workshops and participatory research. Engage community members, including children, women, and men, in art projects that reinforce concepts of autonomy, water and land management, resilience, and climate adaptation.

Capacity Building Approach

Our strategy involves respecting and leveraging *Wixárika* community organisation methods to build a methodology with empathy and active listening at its core. We aim to create a comprehensive training process where capacity building addresses the community's emerging needs and is rooted in a deep understanding of their land and culture[3] (Annex 4).

To ensure the full adoption of RHW, hygiene and land regeneration practices and technologies, it is the certified local Intercultural Team that will carry out paid work for the project. This team will be able to autonomously replicate RWH technologies and hydroforestry regeneration activities, facilitate the workshops and technical training needed for their full adoption in homes, schools and community committees, accompany the creation of co-participation agreements, as well as support group reflections on climate threats and mitigation strategies, collective decision-making and organised collective action.

The intention is that most of the work (organisation, construction of decentralised water infrastructure, regeneration) will be carried out by the communities themselves, thus ensuring local appropriation of adaptation solutions and the strengthening of livelihoods through employment opportunities. We believe that the training of this team, beyond enabling the implementation of the program, creates a seedbed for change agents that will support the survival of the *Wixárika* nation.

Ha Ta Tukari promotes a holistic training process that goes far beyond the development of technical capacities; it addresses the development of capacities that help strengthen the whole community's understanding and ownership of key concepts such as sustainability, land regeneration, water cycles, hydroforestry management and adaptation to climate change – and sets the stage for a new way of communicating and reaching community agreements. This process must be deep, and oriented to generate agency in individuals and communities, so that it can build strategies to face the effects of climate change on the *Wixárika* way of life.

Photo 12. *Capacity building on hygiene practices.*

[3] (Lobo, 2023) y poner en fuentes: Lobo, T and Yurén, T. (2023). Co-construction d'un écosystème pour une vie humaine digne : méta-analyse du projet Ha Ta Tukari (Antoine Rufs. Trans.). Dans Jérôme Guérin, Stéphane Simonian et Joris Thievenaz (Eds.) Vers une approche écologique de l'action humaine dans l'éducation et la formation. (pages 43-68).

Participatory Processes and Community Agreements

To ensure the project's success, we must establish relationships and secure community co-participation agreements at four different levels:

1. **Regional:** We will formalise an agreement between the Ha Ta Tukari programme team and the San Andrés Agrarian Authorities (Comisariado de Bienes Comunales) to collaborate on project design and implementation. An initial agreement is already in place. The project will then be presented to the General Assembly to obtain formal approval from central authorities. Upon approval, the Agrarian Authorities will assist with activities such as inviting localities to participate, forming the Intercultural Team, connecting with local Water Committees and local authorities for the distribution of programme materials, and other tasks. Additionally, we will establish a Ha Ta Tukari Governance Committee, which will oversee all programmatic activities which will include members of our team and the Agrarian Authorities.
2. **Locality:** Community agreements will be made during a community meeting and signed by Intercultural Team representatives and local authorities. The initial agreement will ensure the community provides adequate accommodation, work conditions, and security for the Intercultural Team. Additional agreements will cover food preparation, water and firewood provision, material transportation, and family participation in forest regeneration activities. The community will also engage in workshops and participatory processes. If needed, we will agree on criteria for selecting RWHS beneficiaries. In return, Ha Ta Tukari will execute the project in line with the Tateikie San Andrés Cohamiata Biocultural Community Protocol (Tateikie Communal Property Commission, 2020).
3. **Households:** Beneficiaries of RWHS will sign a commitment to properly maintain and use their eco-technology. Agreements will involve all household members—women, men, girls, and boys—in maintaining the RWHS, with children participating as appropriate, such as draining the first-flush container and cleaning the leaf screen. The agreement will also outline actions to maximise the benefits of the new water access, focusing on water saving, safe management, purification, and improved handwashing practices.
4. **Schools:** In a previous programme phase, agreements were established for maintaining school RWHS and implementing hygiene routines in 18 schools. At this stage, the education team will monitor these agreements to ensure that RWHS use and handwashing practices are properly adopted by students.

Photo 13. *The Intercultural team present water management strategies to the community*

Component 4: Knowledge management and development of a model for community-led universal water coverage

There are several things that make Ha Ta Tukari a unique programme. Though Rainwater Harvesting is in itself a long understood and widely used practice, we have been able to develop new technical solutions aimed at making replication more viable in such a geographically and socially complex context. The Rainwater Harvesting System itself has been developed through an iterative process of testing and monitoring different ideas, and has resulted in a uniquely deployable technological package of demonstrated effectiveness for climate adaptation.

Uniting this with landscape regeneration, working to actively rehydrate the soil, as well as provide new sources of water through RWHS, means a uniquely holistic approach to preparing the *Wixárika* community to take on climate adaptation through new water infrastructure deployment.

Underpinning the first two components, is component 3 - the coordination, community work, and capacity building aspects of the program that have required a great amount of thought and development in order to function effectively in the Sierra. The integration of several protocols and approaches adapted to working with remote and isolated communities has resulted in a very innovative methodology that the Adaptation Fund will enable us to scale and adjust towards the ambition of creating a model for universal drinking water coverage for communities across the Global South. **Component 4 aims to consolidate and learn from the first 3 programmatic components to fully develop this innovative adaptation model to be diffused and shared for replication.**

Main objective: Systematize and document programmatic learning and knowledge to develop a model for community-led universal water coverage.

Concrete Outputs:
4.1 Systematised documentation of all technical and community processes taking place during the programme, capturing lessons learned, data and all relevant information to be used for the final design of the model
4.2. Detailed manual/toolkit for the effective replication of community-led universal water coverage programmes
4.3. A communications strategy to disseminate the impact of our community-led model for universal water coverage within and outside San Andrés Cohamiata.

Integrated outcome:

1. Development of an integrated model for rainwater harvesting systems and landscape water management, with the potential to be adapted and replicated in diverse rural settings across Mexico and the Global South, effectively addressing water scarcity and improving climate resilience in vulnerable communities.

Alignment with Adaptation Fund objectives:
Component 4 supports the achievement of the AF's *Outcome 8: Support the development and diffusion of innovative adaptation practices, tools and technologies.* It does this by both ensuring that the scale up and acceleration of the innovative RWHS technology and landscape regeneration approach is documented, and by ensuring that key practices, findings and tools are shared for replication and communicated as widely as possible.

Related activities:

1. Design the monitoring, evaluation and learning tools for short-, medium- and long-term impact measurement and analysis.

2. Capture data and evaluate the impact of the installation of RWH technologies and the benefits of the increased access to water in the *Wixárika* communities including effects on hygiene practices, gender dynamics, and more.
3. Capture data and evaluate the direct impact of landscape regeneration in terms of soil rehydration, carbon capture and other climate change mitigation needs.
4. Capture data and evaluate the direct impact of the programme's approach to community-led capacity building.
5. Run periodic reflection sessions every 6 months that utilise a variety of sources of information (from activities 2, 3 and 4 above) and take the time to pause and reflect on implementation. Using participatory development methodologies that catalyse learning for ourselves and our stakeholders, we will then adapt programme activities for the coming months to reflect this learning.
6. Consolidate, systematise, and structure all the steps and actions taken in the course of implementation, and produce a manual and toolkit detailing the process and lessons learned, with the purpose of facilitating the adaptation and replication of the model for other communities within and outside of Mexico.
7. Design and deploy an effective communications strategy for the sharing of the manual and toolkit.

Collaboration, Learning and Adaptation

Collaborating, Learning, and Adapting (CLA) is a set of systematic and intentional practices that help improve development effectiveness. Strategic collaboration, continuous learning, and adaptive management link together all components of the programme. Integrating CLA into our work helps to ensure that we are consistently improving our practices and systematising the knowledge these produce in order to ensure we capture it all for a wider climate adaptation audience. Our bi-yearly reflection sessions will feed into both our implementation strategy as well as the development of the model (below). This approach will underpin our Monitoring and Evaluation strategy outlined in more detail in Section III.D. and which will feed into all reporting, planning and communications steps taken by the programme.

Developing the model

A key achievement of our program is the creation of work methodologies rooted in empathy and local experience, united with innovative technological approaches to the water management crisis experienced by the *Wixárika* community. As we advance, our focus will be on refining these methodologies, testing and optimising our tools to ensure they are both effective and adaptable. Central to this effort is the development of a comprehensive toolkit that will be crafted to include detailed instructions on the technologies used, step-by-step implementation processes, and strategies for adapting these methods to different cultural and environmental contexts. This resource will be a cornerstone for replicating and expanding our model, initially in San Andrés Cohamiata, with the ultimate goal of achieving universal water coverage throughout the Sierra *Wixárika*.

To facilitate knowledge sharing and support dissemination, we will produce a range of materials, including detailed reports, guides, and multimedia content such as videos and photos. These documents and resources will highlight our experiences and offer insights into integrated rainwater harvesting and landscape regeneration systems. They will be designed to promote understanding both within and beyond the Sierra, addressing Outcome 8 by developing new tools for the Global South.

By documenting our progress through semi-annual reports and audiovisual materials, we will provide valuable knowledge on the successful implementation and sustainability of water programs. This comprehensive approach will ensure that our model can be effectively replicated in other *Wixárika* communities and rural areas across the Global South.

A gender perspective will be included throughout the model, offering guidance on how to unpick and unpack how gender dynamics within any replicating community interact with climate adaptation needs. The model will offer a framework that can be used to ensure that women and the most vulnerable in the community are included throughout every step of the replication process: from data gathering, to design and implementation.

Communicating the model

An important aspect of this component will be leveraging success stories and testimonials from early adopters within the community to serve as powerful motivators for further communities to join this adaptation challenge. The objective of the communications strategy will be to effectively diffuse and facilitate the replication of a successful community-led model for universal water coverage in rural communities across Mexico and the Global South by raising awareness, building local capacity, and fostering collaborative networks. An example of what this strategy could look like is:

1. Audience Identification:

- Primary: Rural communities in Mexico and similar regions in the Global South.
- Secondary: Local government officials, NGOs, water sector professionals, and potential funders.

2. Key Messages:

- Success Story: Highlight the proven success of the model through data, testimonials, and case studies.
- Benefits: Emphasise the improvements in water access, health, and economic benefits experienced by communities using the model.
- Replicability: Showcase how the model can be adapted and implemented in different rural settings.

3. Communication Channels:

- Local Media: Partner with local radio stations, newspapers, and community newsletters to share success stories and informational content.
- Digital Platforms: Utilise social media, community forums, and a dedicated website to reach a broader audience and facilitate knowledge exchange.
- Visual Aids: Develop infographics, videos, and brochures that illustrate the model's impact and operational details (these will be produced by Component 3).

4. Resource Materials: Provide comprehensive guides, toolkits, and manuals to support communities in adapting the model to their specific needs.

5. Stakeholder Engagement:

- Partnerships: Build alliances with local governments, NGOs, and community organisations to support and advocate for the model’s adoption.
- Local Champions: Identify and empower local advocates who can champion the model within their communities and facilitate peer-to-peer learning.

6. Monitoring and Feedback:

- Impact Assessment: Regularly evaluate the effectiveness of the communications strategy through surveys, interviews, and community feedback.
- Adaptation: Adjust messaging and tactics based on feedback and emerging needs to ensure continued relevance and impact.

7. Scaling Up:

- Replication Toolkit: Share the toolkit for communities interested in replicating the model, including step-by-step implementation guides and best practices.
- Success Stories: Document and share stories of successful replications to inspire and guide other communities.

B. Describe how the program/programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the program/programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

Economic and social benefits

For a community to thrive, fundamental survival needs must be met before other challenges can be tackled. For example, a woman cannot focus on gender equity if she spends every minute of her day gathering water, firewood, and food to keep her family from dying of thirst, cold, or hunger. Addressing the need perceived as a priority by the community (such as water is within the *Wixárika* community) creates conditions to tackle additional needs, like improving hygiene practices to reduce diseases, addressing profound needs like time for women to focus on *their* needs, and improving agricultural practices that do not deplete the soil. This approach is fundamental to this programme's design.

Water security and access - Water access is extremely uneven in Mexico; there is a great amount of overlap between communities that are economically poor, and those that suffer from poor water access. Small, rural, and especially indigenous populations, are much more likely to lack secure water. The *Wixárika* as a whole are a stark example of this. By securing permanent, sustainable, autonomous water infrastructure in this area, and undertaking soil regeneration and water retention strategies, we will help address this inequity, bring social, economic, and environmental benefits while mitigating the negative impacts of poverty and climate change.

Job creation and improved household incomes - The *Wixárika* region has minimal access to paid work, and stable, formal employment is almost non-existent. This program will generate local paid jobs in the forms of rainwater harvesting technicians, capacity building facilitators, landscape regeneration technicians, etc., through the building of the Intercultural Team of installers and promoters (see implementation strategy for more detail). All the current and future technicians and promoters (currently 10, 7 men and 3 women, and a total of 44 or more once the project is ongoing, who would otherwise struggle to find stable employment) are hired directly by us. In addition to this the community will be introduced and supported to begin to monetise the carbon capture brought about by component 2 by selling carbon bonds.

Indigenous people - 100% of the beneficiaries of this program are indigenous people. The programme itself is developed through an intercultural process whereby the traditions, customs and culture are the fundamental building blocks of its deployment.

Gender equity and children - This programme inherently impacts on gender and equity issues, because current water access is highly unequal, and has markedly differentiated effects and implications for women versus men. Since there is very little official data of the region, most of the analysis we count on is made either by research of existing documents, or direct observation from our team and our 14 years' experience working in the region. The most relevant observation is the following: most of the people in the Sierra have to haul their water, and most of the hauling is done by either women or young girls due to the traditionally gendered housekeeping and cooking roles. An initial gender assessment is further developed in Annex 5.

This work, by the mere fact of providing clean water in the homes, will have tangible positive effects on gender and equity dynamics. We strive, however, to go beyond these; we are deeply committed to the integration of women into the implementation team (the Executing Entity's team itself has very strong female representation, including the program director and capacity building director). *Wixárika* women, however, are often not supported by their families when seeking active employment, and effort has to be put into encouraging female candidates to apply. The integration of women into the local team has involved on-going support for them from the whole team. It is the intention of the EE that the growth of the team in the next phases of the programme involves as many women as possible and this will be a key pillar of our human resource strategy.

Having said this, it is important to recognise that the current socio-cultural conditions are complex and in many cases limit the participation of women. Our work proactively tries to prioritise certain beneficiary profiles who have a significantly greater or special need. The most common is the case of single mothers. These women often became pregnant while very young to fathers who did not stay. Having children, they often find it very difficult to re-partner, and are left to raise the children themselves with only whatever limited help their parents and siblings can give. These women often find themselves in conditions of great material poverty, and have to carry out multiple tasks that would normally be shared in a couple. In these cases, eliminating a woman's need to walk for and haul back water for her family is an enormous burden lifted. In single mother households this could mean gaining 12 hours a week that would previously have been spent hauling water.

Women also particularly benefit from their integration into regeneration activities in the programme. And their participation brings several significant benefits both for local communities and the environment. Some of the main benefits include:

- Economic and Social Empowerment: Including women in regeneration activities can increase their access to income and job opportunities. By engaging in these activities, women can gain skills and training that enable them to access better-paying and more stable jobs, contributing to their economic and social empowerment.
- Poverty Reduction: Improving food security and economic opportunities through participation in reforestation programs can help reduce poverty in communities. Forest restoration projects often create temporary jobs and promote the establishment of small businesses related to forest management.
- Health and Wellbeing Improvement: regeneration activities can have a positive impact on community health by improving air and water quality and promoting a healthier environment. Women participating in these programs may also experience improvements in physical and mental health due to physical activity and a connection with nature.
- Strengthening Community Leadership: Active participation of women in regeneration projects can promote female leadership and decision-making in the community. This can lead to greater equity in decision-making processes and more equitable representation in environmental and community management.
- Sustainability and Efficiency in regeneration: Women often have deep knowledge of local ecosystems and traditional forest management practices. Their involvement in restoration can enrich management approaches with a more holistic and sustainable perspective, improving the effectiveness of restoration programs and projects.
- Education and Environmental Awareness: Involving women in these programs can also help raise community awareness about the importance of conservation and sustainable resource management. Women often play a key role in educating their families and communities about sustainable environmental practices.
- Community Cohesion: Participation in collective activities like reforestation can strengthen bonds within the community. Women working together on these projects can build support networks and collaboration that benefit the entire community.

These benefits highlight the importance of including women in all water management and regeneration efforts not only from a gender justice perspective but also as an effective strategy for achieving broader environmental and community goals. With that in mind, the programme will provide childcare services whenever there are training or community meetings so that women can bring their children yet concentrate on the matters at hand. These will be free and available at every training or meeting. This approach has proved very successful in Isla Urbana's work in Jalisco [Nidos de Lluvia]. Women's schedules in terms of current water hauling responsibilities and childcare will also be taken into account when designing capacity building workshops timings.

Environmental

In terms of environmental and access to food benefits, rainwater retention within the watersheds will have impacts on food sovereignty as well as in the landscape and the ecosystemic services it can provide, in turn also attracting biodiversity and generating biomass. Establishing integrated systems (rainwater harvesting, successional agroforestry systems, controlled water consumption and land roaming for livestock) is the key starting point towards soil and forest regeneration, which can, in turn, detonate a more stable habitat resilient to droughts. Water retention within the watershed will also guide communities towards access to diversified and nutritious food, as well as sustainable wood and traditional medicine.

Rehydrating the landscape revitalises depleted areas by increasing their water storage and supply capacity. Within an agroforestry system, this supports food sovereignty and sustainable livelihoods, fostering a cooperative relationship with the land rooted in cultural identity. This productive yet careful approach to soil management yields abundant resources for families, advancing autonomy and sovereignty.

The productive capacity and visible improvements in soil and environmental health within these systems, observed in the short, medium, and long term, encourage people's sustained involvement and commitment. Agroforestry landscapes have the potential to become centres of fertility and biodiversity at family, community, and territorial levels. They enhance the supply of ecosystem services for families, communities, and the broader landscape. This creates social, cultural, and economic conditions that allow future generations to reconnect with their territories, reducing migration and the abandonment of rural areas. This model represents a radical shift from the current agricultural paradigm by advocating for the use of local resources, reducing dependency on external inputs, and striving for economic and ecological autonomy through natural principles such as soil coverings, plant species diversification, and tree incorporation into production systems. Trees act as nutrient recyclers, continually reintegrated into the system.

Mitigating potentially negative impacts

The following measures will ensure that the programme's activities are designed and implemented in a way that does not cause negative social or environmental impacts:

The programme takes place within the context of a semi-autonomous indigenous area, with a large degree of self-rule under traditional government structures and customary law. This fact is considered throughout the implementation process, which involves close collaboration with local traditional authorities. Work in each individual community begins only after having established collaboration agreements with the current representatives of the local traditional government, the details of which are developed in conversation with them, and then set in writing. **The central traditional government, which represents all the communities, requested the extension of the program to every town and village in the area, and the program was formally presented in the main assembly and accepted by the traditional authorities in 2022.**

Traditional governance and custom are always taken into consideration and respected. For example, it was the request of the traditional authority that the work of implementing Rainwater Harvesting Systems in all the communities should begin in the 11 major ceremonial centres where the principal rituals are held. This was agreed upon, and has already been fulfilled, with traditional ceremonies held to bless the work and place it within the framework of the customary law and tradition.

There are two additional risks when it comes to Gender dynamics within the *Wixárika* community that need to be taken into account. The first is that several women, during our years of collaborating with the community, expressed that their time spent collecting water at springs and natural water holes represents an important opportunity to socialise with other women, gossip and have a safe space to share. The program's Component 3 will focus on ensuring that the programme helps create more opportunities for women-only socialising, ensuring safe spaces for intimate conversation and sisterly support are not lost (for more details, see Component 3).

The second risk it is important to monitor and mitigate is the potential resentment that shifting gender dynamics around female leadership in the community could cause amongst male members of the community. *Wixárika* women have shared their fear with us that, with the increasing pressure at the municipal level to empower and lift women into positions of leadership (often for the first time) , that this can cause resentment and even domestic violence as men often feel excluded from these kinds of processes. The programme will promote that any activities which may impact gender dynamics in the community are underpinned by masculinity workshops and consultative processes and training for *both* men and women. It is important to include both genders in re-imagining how, when transforming the community's approach to adapting to climate change, women's increasing leadership, empowerment and equality can be a source of positive transformation for **all** members of the community.

C. Describe or provide an analysis of the cost-effectiveness of the proposed program/programme.

Given that 47% of the region's water infrastructure works are not functioning, including tanks, hydraulic pipes, wind pumps, and more, it is urgent to provide adaptive water infrastructure as well as addressing the need for the rehydration of the landscape that will help regenerate the natural water sources the *Wixárika* rely on for survival. It is challenging to provide a clear description of alternative options to the proposed measures of RWHS as there are very few comparable strategies that could address the water shortages in such a remote and challenging area which only relatively recently received road access. Any other intervention would necessitate large scale government infrastructure investment costing at least five times the amount of funding we are requesting from the Adaptation Fund, investment that has the potential to threaten the *Wixárika*'s ancestral way of life. Moreover, once that infrastructure is built, the distribution would have a cost. The expected rainwater volume harvested per year is 19,904,031 to 22,430,281 litres, with an equivalent annual cost of $1,518,500 to $1,711,250 MXN (using the minimum domestic water cost per litre in the state of Jalisco in 2023; equivalent to $86,771 to $97,785 in USD at a 17.5 exchange rate). Once the RWHS are installed that volume will be harvested each year for free.

Rain Water Harvesting Systems - community co-participation and labour costs

The most important element of cost-effectiveness is the 'co-participation' model under which this program will be implemented. Beneficiaries who will receive RWHS in their homes must offer 10% of the total value of their system (approx. $6,000 MXN or $340 USD of a total value of $60,000 MXN or $3,400 USD) in the form of labour. We are calculating a daily rate of $500 MXN/day (approx. $29 USD) which means that each household of an average of 2 adults will offer 12 days of labour to the program. This represents 12,000 days of labour from the 1,000 beneficiary families. This is principally a way of ensuring deep community ownership and accountability when it comes to their climate adaptation future - every family will have a role to play and a stake in the ultimate success of the programme; they will also develop knowledge and capacities through this work that are the basis for replication and expansion.

On average, each water-hauling trip takes around 2 hours and collects 55.4 litres of water. Annually, this program will save between 719,000 and 810,000 hours of hauling, with 489,000 to 551,000 of those hours saved for women. This translates to 719 to 810 hours saved per family each year, with women within one family saving 489 to 551 hours. On a weekly basis, families will save about 14 to 16 hours, with 9 to 11 of those hours being saved by women. Additionally, the average home will only need to partially haul water from February to June, while completely relying on rainwater the rest of the year. According to our findings, around 4% of the population transports water by truck (in prefabricated tanks). This need can be practically eliminated with RWHS, which would annually save between $217,135 and $407,823 MXN (approximately $12,408 to $23,304 USD using a 17.5 exchange rate) by 4% of the population, based on the cost range of transporting 1100 litres by car within San Andrés Cohamiata of 300 to 500 MXN ($17-$28 USD).

Materials chosen and an adaptive implementation strategy

The program team has done a thorough cost benefit analysis of two principal RWH technologies as outlined in Section IIA and detailed in Annex 2. Geomembrane and concrete tanks have comparable costs, with concrete the marginally more expensive but more sustainable. There is a difference of $487 USD in terms of cost which considering the scope of the project will not make a significant difference to the budget versus impact evaluation. Extensive research, including attending the full installation of the concrete tank technology, has been conducted to ensure that the technology chosen ensures the best outputs and outcomes are achieved for the community by weighing cost, amount of water each type of system can provide, sustainability of the tanks, feasibility of installation in such a challenging setting (transport of materials). We have decided to install both types depending on the level of road access of beneficiaries' homes. The *Wixárika* Intercultural installation teams will be fully trained in both technologies to ensure that the programme can constantly adapt its implementation approach as needed when assessing which of the two types of tank can be installed.

Water purification

Further extensive research has been done to evaluate what is the most sustainable and cost effective way for beneficiaries to purify the rainwater captured to ensure it is drinkable. Water purifiers which necessitate frequent filter replacements have been judged too expensive in a community with severe poverty- one brand's filters cost $5 USD but must be replaced every 2 months, and the other cost around $50 USD every 2 years - and it is unlikely that local stakeholders will adopt the technology. The most cost effective means to purify water is using disinfection drops which cost $2 and would need to be bought twice annually. They are now sold in the small convenience stores dotted around the communities we will be working with and which have a much better litre/peso cost efficiency ratio. Component 3 will be focusing on ensuring beneficiaries know how and when to purify their water.

Regeneration and carbon capture

The co-participation approach means that a significant part of the regeneration and SAFS work in Component 2 will be done as co-participation in exchange for the RWHS from Component 1. 12,000 days of labour or $6,000,000 MXN ($343,000 USD) that will be technically paid with RWHS installations and does not need to be funded.

The regeneration component (2) is inherently cost effective by setting up *Wixárika* communities to capture carbon and eventually sell carbon bonds on the carbon market. There is no alternative way for communities to ensure the autonomous sustainability of the regeneration component from a financial standpoint. Carbon capture will allow for continuous income to support the scaling of this work. Therefore the program will not only be supporting the *Wixárika* community to become more climate adaptable, but will set them up for a longer term role in offsetting carbon and combating climate change.

D. **Describe how the program/programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national adaptation plan (NAP), national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.**

This program is consistent with several national and subnational strategies and tools related to climate change, as well as strategies related to indigenous peoples rights and customs. Their related objectives are summarised here:

1. **Article 4 of the Mexican Constitution**: every person has the right to health protection

2. **The General Climate Change Law of Mexico**
    a. Reducing vulnerability and increasing resilience of the social sector.
    b. Increasing access to, reducing vulnerability and increasing resilience of critical infrastructure and productive systems.
    c. Preserving and sustainably using ecosystems and the environmental services they provide.

3. **Updated NDC 2030 goal**: 35% carbon emissions reduction

4. **PROMARNAT (2020-2024 Sectoral Environment and Natural Resources Program), through its Priority Objectives 1, 2, 3, 4, and 5:**
    a. Objective 1: Promote the conservation, protection, restoration and sustainable use of ecosystems and their biodiversity with a territorial and human rights approach, considering biocultural regions, in order to maintain functional ecosystems that are the basis of the well-being of the population;
    b. Objective 2: Strengthen climate action in order to move towards a low carbon economy and a resilient population, ecosystems, productive systems and strategic infrastructure, with the support of available scientific, traditional and technological knowledge;
    c. Objective 3: Promote water as a pillar of well-being, managed by transparent, reliable, efficient and effective institutions that ensure a healthy environment and where a participatory society is involved in its management;
    d. Objective 4: Promote an environment free of water, air and soil pollution that contributes to the full exercise of the right to a healthy environment;
    e. Objective 5: Strengthen environmental governance, through free, effective, meaningful and co-responsible citizen participation in public policy decisions, ensuring access to environmental justice with a territorial and human rights approach and promoting environmental education and culture.

5. **PECC (Special Climate Change Program), through objectives 1 and 3:**
    a. Objective 1: Reduce the vulnerability of the population, the ecosystems and their biodiversity, as well as the productive systems and the critical infrastructure through the impulse and strengthening of adaptation processes and resilience.
    b. Objective 3: boost actions and policies that demonstrate synergy between mitigation and adaptation, and that address the climate crisis, prioritising the generation of environmental, social and economic co-benefits.

6. **The National Climate Change Strategy**
    a. Attend to the most vulnerable communities
    b. Program transversality
    c. Promote prevention
    d. Sustainability in the use of natural resources
    e. Preservation of ecosystems and their biodiversity
    f. Active participation of target population and capacity strengthening

g. Adaptation capacity strengthening
h. Coordination between actors and sectors
i. Flexibility
j. Monitoring and evaluation of enforcement and effectiveness of the actions taken

7. **The Special Climate Change Program (this program is specific to Federal Public Administration, but our program in consistent with it nonetheless)**
    a. Territorial and ecosystemic approach: consideration of socio-environmental and institutional diversity, and the sustainable management of the territory and its resources
    b. Human rights, social justice and gender equity: consideration of equality of rights, ethnicity and gender differences
    c. Inclusive and participative processes: adaptation must result from a collective and inclusive process

8. **The 2030 Agenda for Sustainable Development**
    Mexico developed its National Strategy for the Implementation of the 2030 Agenda, a guide document with mechanisms to understand the route that leads to the desired future. Our program is consistent with its 6th Axis - maintaining a territorial approach and implementing the vision at the municipal level - and the following SDGs (to a greater or lesser extent):
    - 1) No poverty
    - 2) Zero hunger
    - **3) Good Health and wellbeing**
    - **5) Gender equality**
    - **6) Clean water and sanitation**
    - 8) Decent work and economic growth
    - **10) Reduced inequalities**
    - **11) Sustainable cities and communities**
    - **13) Climate action**

9. **Sustainable Financing Mobilization Strategy** (Estrategia de Movilización De Financiamiento Sostenible), from SHCP, of which this project is a part of.

10. **National Strategy about Biodiversity in Mexico** (Estrategia Nacional sobre Biodiversidad de México), Action Plan 2016-2030.

11. **Jalisco State Climate Change Strategy, 2050 Vision**
    - The strategic axis that seeks to "Ensure food sovereignty and resilient supply chains" aims, among others, to transform, adapt, and strengthen sustainable and efficient production models. Successional agroforestry systems align with the established lines of action for this strategy, as they include elements considered within the proposal, such as: productive systems that consider the carrying capacity of the territory and the food needs of the local population; reinforcing the protection of native agrobiodiversity; ensuring resilience through agricultural practices that maintain ecosystems and soil quality, and promoting the adoption of practices and technologies for efficient water use in the agricultural sector.
    - additionally, the strategic axis that aims to "Integrate water resources and watershed management" includes several related lines of action regarding water harvesting in buildings and landscapes, namely: "Strengthen the integrated management of surface and groundwater" (A5.3); "Promote secure access to water for life, health, and productive processes, focusing mainly on areas with water stress and increasing scarcity" (A5.5); "Encourage actions for rainwater management based on ecosystems" (A5.7), and "Promote actions to increase infiltration, pre-infiltration treatment, and protection of recharge areas."

12. The program is also consistent with the adaptation and mitigation strategies presented in the most recent **Climate Change Action Plan in the State of Jalisco**, where the program is being implemented,

the “2015-2018 State Program for Climate Change Action, PEACC” (2018).

13. **Biocultural Community Protocol of the Tateikie San Andrés Cohamiata Community**
The *Wixárika* community of San Andrés Cohamiata developed the Biocultural Community Protocol as a management instrument to regulate the mechanisms for requesting access, negotiation, fair and equitable distribution of goods derived from biological and genetic resources and traditional knowledge present in the *Wixárika* territory. The hole methodology of this project is based on the following:
    - Ensuring the conservation of natural resources in the community
    - Preserving cultural traditions and the way of making decisions
    - Generating mutual agreements with people interested in their resources
    - That those people interested in the community's resources present themselves and that through ordinary assemblies and local meetings, the community is informed in detail through reflection and awareness workshops, and on the bases of clear communication, the community has the right to negotiate and consciously decide whether or not they can access their resources, prevailing respect for fundamental rights and indigenous rights embodied in international agreements, in the Mexican Constitution, Mexican laws and in the customs and traditions of the community, guaranteeing the participation of local police stations, children, women, men, agrarian and traditional authorities, council of elders, former authorities; thinking about children and future generations, so that they can continue enjoying the biological and cultural wealth of the *Wixárika* territory.

14. Additionally, a Justice Plan for Indigenous Communities of the state of Jalisco, which strongly includes the *Wixárika*, was published in 2023. Our programme will comply and uphold this new justice plan.

E. Describe how the program/programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

There are currently few national technical standards specifically governing rainwater harvesting in Mexico. There are, however, guidelines for Rainwater Harvesting System Design set out by the National Water Commission (CONAGUA) through the program PROCAPTAR, and by the Mexico City Secretary of the Environment (SEDEMA CDMX), through the manual for domestic Rainwater Harvesting (this manual was written and coordinated by Isla Urbana in 2019 and 2020). The Rainwater Harvesting systems proposed for this program are designed in accordance with these guidelines.

Regarding PROCAPTAR (the biggest federal government reference about RWH), our systems do meet most of its technical standards, but the very premise of this program is limitative in terms of program deployment: it states that the minimal annual rainfall to operate is 1,500 mm, almost double the rainfall of the Sierra. If we followed this standard, most of the Mexican territory would be discarded for RWH. In this sense, the international agreement for minimal rainfall amongst the RWH community is 400+ mm (the border between arid and semi-arid regions).

The primary technical standard governing water for human consumption in Mexico is the Secretary of the Environment’s NOM-127-SSA1-2021 regulation which establishes permissible limits for various pollutants. RWHS similar to the ones to be used here have been tested multiple times by certified labs and successfully met these standards.

Still, harvested rainwater quality can vary through many local conditions, and so the proposed program involves performance of tests and analyses of water quality carried out by certified third-party laboratories throughout the implementation process and in several locations of the Sierra. These tests follow the procedures for water-quality testing set out in the NOM-014-SSA1-1993.

Based on Article 7 of the National Waters Law (Ley de Aguas Nacionales), the following indexes apply to the proposed program as public utility or public interest:

- Art. 7, I - Integrated management of surface, subsurface water resources, based on the hydrological basins within the national territory as a priority and as a national security issue.
- Art. 7, V - Restoring the ecosystems' equilibrium relevant to water quality
- Art. 7, VI - Increasing the efficiency and modernization of domestic and public water services, as a way to contribute and improve public health and wellbeing, to improve the quality and accessibility of the resource, as well as making a contribution to the goal of reaching an integrated management of water resources
- Art. 7, IX - To prevent and address the effects of unusual meteorological phenomena that could affect the people, productive areas or installations.
- Art. 7 BIS., V - The prioritisation to address water related issues within communities, aquifers, hydrological basins and hydrological regions with water scarcity.

Our programme is compliant with the following Principles of the Environmental and Social Policy of the Adaptation Fund:

Table 4. Compliance with AF principles

AF Principle	Programme Compliance
Compliance with the Law	All our actions will be consulted and have been previously approved by all relevant federal, municipal and community governance bodies and structures. Similarly, our water technology and infrastructure has been tested and approved to deliver water quality which meets the minimum water quality standards on several government and philanthropically-funded programmes.
Access and Equity/ Marginalised and Vulnerable Groups	Our programme is specifically designed to address the water scarcity problem for one of the most marginalised and vulnerable groups in Mexico. Within the community, we will ensure that the most vulnerable within the community, specifically indigenous women and children, are the most benefited by this program. Given that the ambition is universal water coverage, all vulnerable people in the community will receive a RWHS as part of the wider Hata Tukari programme.
Gender Equity and Women's Empowerment	Women bear the main responsibility of providing water for their families and will therefore be the most benefited by having access to potable water in their homes. A gender equity lens will be applied to all key programmatic design decisions.
Indigenous Peoples	Our program will be co-designed with and exclusively benefit indigenous people. The program complies with The UN Declaration on the Rights of Indigenous Peoples.
Involuntary resettlement	Our program increases the feasibility of communities staying in their original homes. The current water crisis means that it is becoming increasingly difficult for the *Wixárika* people to stay in the San Andrés Cohamiata, this program is in part designed to make it possible for the community to avoid involuntary resettlement.
Protection of Natural Habitats	Our program has the intention to modify micro basins in order to increase water availability within the landscape. However, the physical modifications created will benefit the ecosystem, reduce erosion rates and increase the landscape water retention.

Conservation of Biological Diversity	Our program will not harm the ecosystem or any biological species within it. Component 2 is designed to increase soil biological diversity.
Climate Change	Although the use of fuel to transport equipment will be used, no other significant source of Greenhouse gas emissions will be used.
Pollution Prevention and Resource Efficiency	As our program will be conducted in a very isolated region, the reuse of disposable materials will be highly encouraged. Similarly, most infrastructure comes with no packaging. There is a full mitigation strategy; see below for any risks of pollution from materials used to create rainwater harvesting infrastructure.
Public Health	Our program will be carried out in a way that enforces the best practices during installation, transport and assembly to guarantee the health of staff, the community and providers. Health and safety protocols will be provided and training will be compulsory for all members of the team, staff or volunteers, participating in regeneration activities. The programme will include the promotion of water purification and better hygiene practices as part of its capacity building component (3) to increase the health impacts of better access to water.
Physical and Cultural Heritage	This program will be carried out with members of the *Wixaritari* community, of which have been consulted before and will continue to be consulted on the matter of cultural values, beliefs and resources.
Lands and Soil Conservation	This program will be carried out in a manner that will prevent soil erosion and loss of biodiversity, as well as promoting the production of organic soil, increasing soil resilience to a changing climate, and increasing water retention in the forest and soil in the San Andres region.

F. Describe if there is duplication of program/programme with other funding sources, if any.

Our funding sources do not overlap; instead, they complement previous and ongoing initiatives. We will continue to seek out additional projects and programmes for potential synergies and collaboration as we expand the impact of Ha Ta Tukari.

Beyond our work in *Wixárika* communities, Isla Urbana works with an extensive network of partners and collaborators, whose support can be leveraged for the development, execution, communication, and evaluation of this programme. Notable collaborators include the National Institute of Health (INSP), National Geographic, the National Autonomous University of Mexico (UNAM), Agua Capital, the Ashoka Network, among others. These collaborations have bolstered our recognition and visibility, earning us the trust of important partners.

Additionally, Isla Urbana has cultivated a close collaboration with the State Government of Jalisco, involving the installation of Rainwater Harvesting Systems (RWHS) in homes in Guadalajara (Nidos de Lluvia), as well as in schools. In 2023, the State Government began funding RWHS in the *Wixárika* Sierra. This close working relationship with the government of Jalisco, where the *Wixárika* reside, is highly complementary to this programme, allowing us to rely on their support across multiple fronts, especially when it comes to security (see Section III).

The work undertaken over the past 14 years in the *Wixárika* Sierra has been made possible through a diverse array of partnerships and collaborations with funders, NGOs, civil society organisations, and numerous national and international institutions, including UNDP, HSBC, PepsiCo Foundation, the National Institute of Social Development (INDESOL), the Gonzalo Río Arronte Foundation, the National Institute for Indigenous Peoples (INPI), and the Mexican Institute of Water Technology (IMTA), among others.

The Ha Ta Tukari programme is currently funded primarily by the Gonzalo Río Arronte Foundation (FGRA) and the Casa Córdoba Foundation, with a total of approximately USD $500,000 invested between 2020 and 2025. The funds we are applying for from the Adaptation Fund are specifically intended for the expansion of the programme in San Andrés Cohamiata. However, our overarching goal is to ensure universal access to water throughout the *Wixárika* nation. This means we will continue to pursue additional funding sources that will help us achieve this longer-term vision. With this aim, we are working to secure further support from the Gonzalo Río Arronte Foundation. There will be no duplication, and both programmes will progress independently; this potential funding from FGRA will allow us to initiate RWHS work outside San Andrés Cohamiata in the other three Agrarian Nuclei that make up the *Wixárika* nation, as well as integrating other components, such as sanitation.

We are consistently seeking opportunities for complementarity, recognising that our goals are ambitious and will require time, effort, and diverse collaborations to achieve. In the Concept Note for this grant, we estimated a total cost of adaptation (universal RWHS coverage for the entire *Wixárika* Nation) at approximately USD $15 million. The potential support from the Adaptation Fund is a significant driver of our scaling ambitions and has enabled a wider and broader vision when it comes to preparing the *Wixárika* for a climate resilient future.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

Component 4 is the programme's knowledge management component and describes the programme's strategy for the capture and dissemination of lessons learned.
As outlined in Section II.A., we will be following an intentional approach called Collaboration, Learning and Adaptation (CLA), to support the programme and its stakeholders go beyond traditional Monitoring & Evaluation. The approach will provide a framework for collaboration that translates M&E data (see section III.D) into learning, and uses learning to improve activities and impact. The collaboration element is critical to ensure that the *Wixárika* community's perspective is fully integrated into our strategies, ensuring we collectively understand the evidence behind performance and support project planning decisions.

The effective capturing of data and learning in innovative and creative ways will in turn feed into our communications strategy (again, outlined in Section II.A.) and the creation and dissemination of our model and toolkit for universal water coverage. All with the ultimate goal of enriching the global, national and local knowledge on climate change adaptation and to accelerate understanding about what kinds of interventions work.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during program preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

The consultative process of this programme builds on 14 years of close collaboration with the Wixárika community. Every major step in the evolution of the work has occurred in dialogue and consultation with the local population. Isla Urbana and several other partner organisations have been working with the *Wixárika* community since 2010 in response to an explicit request from a village leader who was searching for help to address the water access problems faced in the locality of La Cebolleta. Our first trip to the Sierra was dedicated entirely to speaking with people from the community, visiting their existing water sources, and over several days, discussing multiple ideas to address the problem. In an interesting preview of working with the Wixárika, our hosts on that first trip conducted a ceremony to bless the nascent project, to ask that we find resources for it, and they named it Ha Ta Tukari -Water, Our Life.

The *Wixárika* are the principal stakeholders of this work; understanding the spiritual framework, traditional governance structures, communication styles, taboos, and forms of communal organisation present in *Wixárika* culture is crucial for the success and sustainability of the programme. To give one example, we have learned that in order to begin working in a new *Wixárika* community, it is necessary to first be formally “presented” and give an offering of candles, corn, and some very specific items, in the local ceremonial centre. Failing to do so causes the people to fear that the work will not be spiritually grounded, and any accident or incident that occurs will often be blamed on this failure.

This proposal has emerged from a deep consultative process rooted in our long-standing collaboration with the community. Unlike projects ideated by outside groups and then brought to the community for consultation, this initiative began as a direct response to requests from *Wixárika* individuals seeking help to address severe water scarcity. Since the first Cebolleta contact, the process has evolved through continuous consultation and collaboration with local communities and authorities, focusing exclusively on areas that have explicitly sought our partnership. Communities reach out to us because they see the potential benefits of working together.

The team executing the programme is predominantly composed of local *Wixárika* who have been involved in this proposal's development from the start. For the past two years, they have installed RWHS in schools and clinics across the region. The team has already visited each of the 21 target communities and held meetings with all of them. They expressed confidence in expanding the project's scope to the scale outlined in this proposal, which motivated our pursuit of funding to achieve universal water coverage in the region.

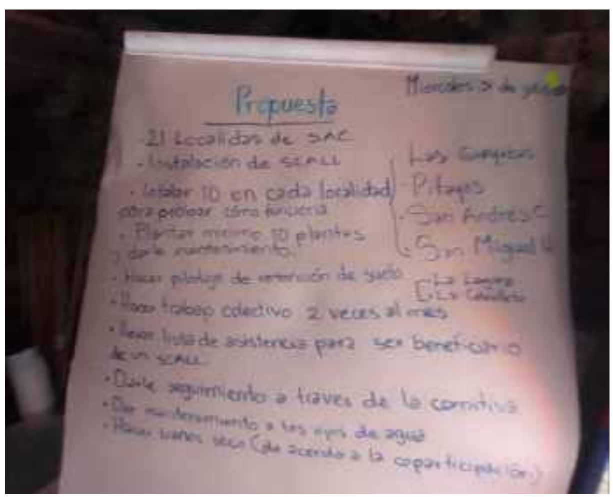


Photo 14. *Intercultural Team meeting to co-design the program*

Our most recent consultation process was conducted in each locality, using a mixed qualitative-quantitative methodology to gather information across three key areas: community, school, and home. We surveyed a diverse range of informants to ensure a comprehensive representation of the locality, including community authorities, health personnel, teachers, community leaders, with an even distribution of women, men, girls, and boys. Information was collected through various activities, such as participatory methodologies, questionnaires, community tours, and observations of hygiene practices among primary and secondary students. Additionally, we held workshops with focus groups to give a voice to community members of all ages. These workshops were designed using the "*La*

Ventana Infinita" (The Infinite Window) method, which employs art to engage children and socially disadvantaged communities (see table 5).

Table 5. Community Consultation Activities

Field	**Activity**	**Informants**	**Information gathering technique**	**Information gathering instrument**	**Number of instruments applied**	**Sample**
Community	Interview with authorities	Local authorities	Questionnaire	Locality file List of water sources in San Andrés Cohamiata Photographic record	17	89% of participating locations
	Participatory mapping	Women, men, girls and boys in focus group	Participatory workshop			
	Community tour	Key informants: authorities, health personnel, community leaders, etc.	Observation for verification and registration of information			
	Collective creation of the history of water in my community	Women and men in focus group	Participatory workshop	Format for collecting information on the history of water in my community	18	95% of the locations. Average of 12 participants, 58% women, 42% men.
Household	Household survey	Adults in their homes	Questionnaire	Household questionnaire	177	8.5% of households*
School	Interview with the school direction	Teachers/ school management of preschools, primary and secondary schools.	Application of the questionnaire	Scholar file	22	51% of primary schools
	Tour of the school campus		Observation for verification and registration of information	Photographic record		

*The sample of 8.5 does not include the population of San Miguel Huaixtita and El Chalate. This report contains information from both localities obtained through various instruments, but no household survey was conducted.

The results obtained from this work have helped build a better understanding of the ways community members within *Wixárika* Villages understand and perceive the water scarcity problems they live with, and crucially, how they have experienced the work and involvement of our team. These interviews have been very valuable in the continuous process of analysis and reflection on how to better collaborate across cultural differences. They have also allowed our team to get feedback from a very diverse cross-section of the *Wixárika* population on the impact and perceptions of our work.

Generating and collecting information for this consultation process required a complex process of capacity building for the Intercultural Team. Sufficient baseline quantitative and qualitative information was obtained to verify future changes in access to water, as well as in the hygiene and sanitation practices of the community. This will be invaluable for the knowledge management and M&E components of this programme.

The objective of thoroughly understanding the water situation in San Andrés was achieved, but there are areas for improvement to ensure the most accurate information. Although the sample design aimed to interview around 10% of households in each locality, some localities fell short of this target, while others exceeded it. We propose continuing the process to strengthen the sample size in those localities where it was insufficient.

We were unable to obtain sufficient and consistent information on the community's health situation, which is always a sensitive topic for beneficiaries. To address these gaps, we will develop more effective participatory tools to better understand how the *Wixárika* community perceives its health. Additionally, we will seek partnerships with regional health authorities to access accurate local data, as this information is crucial for assessing the impact of improved water access on community health. More detailed information about the consultative process can be found in Annex 8.

Recently, several significant developments have occurred that are crucial to the success of the Adaptation Programme. In October 2023, the newly elected local government officials for the entire San Andrés region approached us, expressing strong motivation to see this project succeed and agreeing to support it in any way necessary. During a field visit to the Sierra in April 2024, we received approval from local authorities to not only continue scaling up household RWHS but also to explore forest regeneration activities. These authorities have already identified suitable areas for regeneration efforts (component 2) and will play a key role in guiding decisions on where and when to begin this next phase of RWHS installation.

Photos 15, 16, and 17. *Meetings with local authorities for the extension of the programme and the identification of regeneration polygons.*

Table 6. Leaders consulted and who later approved this intervention in the community

Name	Role
Alfredo Carrillo Salvador	Commissioner of Communal Assabley
Paulita Carrillo Carrillo	Treasurer of communal lands
Prodencio Carrillo de la Cruz	Secretary of communal lands
Miguel Carrillo López	Traditional Governor
Claudio Montellano de la Cruz	Community Technician
Humberto Ramírez Díaz	CADET - Comisión de Análisis de la Defensa del Territorio. (Territorial Defence Analysis Commission)

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Component 1: RWHS

Baseline: Water infrastructure in the *Wixárika* Nation is either non-existent or in very poor condition. Only a few communities have access to tanks and piping, but most of this infrastructure is old and has not been maintained, so the whole population has to rely on the limited and already overexploited natural sources nearby (water holes and springs) and haul water to their homes, mostly by foot (only 4% of the population has the means to do it by truck) and store it in buckets. The mountainous terrain, isolation, and insecurity deepen the political abandonment the *Wixárika* people suffer; little to no government funds are allocated to these massive needs. *Wixárika* people live off a maximum of 13 litres of water a day, less than what the World Health Organization recommends for a dignified life (20 litres/day/person). The *Wixárika* are extremely vulnerable to the effects of climate change on the availability and quality of water from the natural sources that their lives depend on, and have a baseline of almost no resiliency measures to mitigate the risks to their way of life. The exception to the above are the approximately 300 RWHS previously installed in the region by our team.

With AF Funds: Most households of the 21 localities of San Andrés Cohamiata will have a functioning RWHS with 12,000 to 14,000 L storage tanks, that will be able to harvest up to 25,000 L of water for all domestic purposes every year, for no cost except their co-participation during implementation. Water hauling will be reduced to around 30% of what it is now. Families will have the technical capacities and knowledge to operate, maintain, and do basic repairs to their RWHS - which will bring them safe water, almost year-round-, purify and drink their harvested water, thanks to a decentralised infrastructure that will grant them resilience, satisfy their water needs and improve their quality of life, and greatly reduce the time, effort, and money currently dedicated to water provision.

Component 2: Landscape-scale Water Management and Regeneration

Baseline: The *Wixárika* Sierra is undergoing desertification. Soil erosion and free grazing are depleting the land, while longer dry seasons intensify forest fires, further thinning the forests. Agricultural soils retain less water, leading to inadequate harvests for subsistence, and water holes are shrinking due to overexploitation by a growing population. The *Wixárika* people lack the means to provide water at a household level, living in a constant state of scarcity and vulnerability.

With AF Funds: The *Wixárika* people will develop skills in land management and regeneration, gain firsthand experience in restoring hundreds of hectares, and learn about innovative Agroforestry Systems. The newly formed Ha Ta Tukari Governance Committee will lead this work in coordination with authorities, communities, and beneficiaries of Component 1. This approach will foster a deep understanding of these solutions, enabling their implementation, replication, and expansion. The result will be healthier, more humid forests, landscapes, and soils—better suited for self-subsistence agriculture. Additionally, there will be increased water availability in local sources, along with enhanced local knowledge and capabilities for improved land management. Through carbon bond programs, these efforts could also create economic stability, ensuring long-term sustainability and significantly boosting the Sierra’s climate resilience.

Component 3: Capacity Building

Baseline: The *Wixárika* currently have limited knowledge of water and land management, rainwater collection, water purification, and hygiene practices. Issues like hygiene, sexuality, gender, and mental health are rarely addressed. Stable job opportunities are scarce, forcing many to leave the area for months each year to find low-paying work, often in industrial agriculture. Aside from traditional *Wixárika* crafts, there is little local industry, and few spaces exist for learning, creating, and sharing knowledge outside of schools and religious settings. Learning materials are often insensitive to the local context, and traditional practices are excluded from adaptation processes in the *Wixárika* Nation.

With AF Funds: A *Wixárika* team will be trained and employed, providing stable work opportunities for over 40 local men and women. This team will become facilitators and technicians, teaching rainwater harvesting, landscape management, hydroforestry, and hygiene practices. Spaces will be created for artistic expression and learning, with context-sensitive educational materials developed in the *Wixárika* language. Traditional knowledge will be integrated into these efforts. New Intercultural Teams will focus on land regeneration, introducing novel practices to a significant portion of San Andrés Cohamiata’s population.

Component 4: Knowledge Management and the Model

Baseline: Without Adaptation Fund support, Ha Ta Tukari is a small and fragmented effort which has a significant impact on the families and communities that have received RWHS but cannot be synthesised and understood as a scalable model that can be replicated to achieve universal water coverage for a larger community.

With AF Funds: Having one concentrated and larger scale effort like this will allow us to capture and systematise all the lessons learned and translate them into a toolkit and model that can have a much broader significance in the adaptation community: offering a pathway to universal water coverage for communities across the Global South. Essential to this will be an innovative communications plan to accompany the creation of the toolkit to ensure other communities know that this kind of impact is possible.

J. Describe how the sustainability of the program/programme outcomes has been taken into account when designing the programme.

The adaptation benefits achieved with the help of this AF programme have been designed with sustainability, scalability and replicability at their core.

Component 1: Rainwater Harvesting Systems

Once built, the 1,000 RWHS will provide fully autonomous and renewable water in every homestead. They are capture, treatment, and storage systems that can be locally installed, maintained, operated, repaired, and expanded as necessary. The design is a result of years of experimentation for minimal operating costs, ease of use, durability, repairability, deployability, in extremely isolated areas that are difficult to reach with heavy materials and equipment. The result is a RWH system with a 12,000 to 14,000-litre capacity storage tank, with pipes, gutters, and filters. The geomembrane tank is extremely lightweight and can be transported pretty much anywhere, including places with no vehicle access, and can be quickly installed in every home. The concrete tank will provide very sustainable and durable access to water for many years to come. Since there is no water infrastructure in homes, the systems can be adapted to pretty much any building. Small dispersed houses with metal sheet roofs with vast space around them simplifies the installation of on-ground 5 metre-diameter cisterns, with simple filters designed for unpolluted rural contexts.

The RWH system is a tool with the potential of providing permanent water access, but its success relies on full adoption and the development of a permanent practice. No decisions are taken without the user's engagement and agreements. Families decide where their cisterns will be installed with the help of the local technicians, and extensive one-on-one training is carried out (during technical visits, installation, and follow-up). The RWH system installation is always accompanied by a process of co-design and local capacity building, support, monitoring, maintenance and repair. The 1,000 RWHS installed with the help of the Adaptation Fund are part of a larger ambition to achieve universal autonomous drinking water coverage for the *Wixárika* nation and as such their implementation have been designed with scale as a key focus in terms of impact and learning for future replication.

Component 2: Landscape-scale Water Management and Regeneration

The landscape water management activities will follow the same community intervention model as that of Component 1 : trained technicians in the field, involvement of the community and end-users, local capacity building, monitoring, support, and follow-up. By working with the entirety of the community, we will seek to prove the feasibility of the interventions to detonate a new water management culture that integrates the landscape, and normalise these practices in the communities, through a common understanding of the challenges and benefits they entail. This approach has the highest opportunity to ensure sustainability.

Regeneration is inherently sustainable - by enhancing the land's water retention capacity, the area will support a larger and more diverse population of flora, which is crucial for preventing desertification and will increase and prosper over time. This will create a refuge for plant species that might otherwise be lost due to rising temperatures and decreasing precipitation in the coming decades. Our training program and the co-participation model whereby it is community members/beneficiaries who implement regeneration activities means that the technical knowledge and know-how will serve and exist within the community long after the programme ends, reaping the benefits of a healthy, well-preserved ecosystem for future generations.

Carbon Capture

This component will ensure that the 700 hectares undergoing regeneration land help sequester carbon from the atmosphere, storing it in organic matter and making the area a small but significant carbon sink. Over time, this area could become suitable for carbon credits, given its potential to develop healthy, carbon-rich soil. One of the intentions of component 2 is to support the community to enter the carbon bonds market; this could provide a stable income for the community, encouraging the growth of a fully sustainable industry.

Women's role in the sustainability of the programme

Women will play a crucial role in the sustainability of the programme. They are the custodians of the community's traditional knowledge and predominantly responsible for transmitting practices to future generations. They are the ones who collect and manage water in the households and are the first to perceive the great impact that improved access to water has on their well-being and that of their children. They often become the best promoters of the best practices promoted by the programme, conscientiously monitoring the quality of the water stored in their RWHS and teaching their children to do so. Their unique perspectives and experiences enrich ecosystem water management strategies, ensuring that actions taken are culturally relevant and effective. We will prioritise women's involvement in the RWH Intercultural Team, Programme Leadership, and their holding important positions of influence within the Committees that will govern activities.

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the program/programme.

The program does not have any significant environmental and social risks, in fact, it should help reduce and mitigate them significantly through the increased availability of water. In the same line, regenerating the forest and soils and creating new water bodies can increase overall humidity and stabilise rain patterns.

The main environmental impacts we hope to achieve relate to the landscape-scale work of soil and rainwater retention, by which we intend to fight the trend towards desertification, promote the recharge of springs and water holes, and assist in increasing vegetation cover.

In terms of social impacts, the detonation of participation and community involvement spaces, sensitive to the cultural context, can greatly improve social dynamics in place. Further, the promotion of local work opportunities, with professionalised technicians and promoters, can be of great help in the detonation of a local economy that can impact many families' incomes. There is also the topic of gender, where we seek to integrate women more and more and initiate conversation about gender equity issues, without disrupting the traditions and social structures in place. Therefore, the program allows us to create new spaces where women can integrate the participative processes and facilitate their involvement, and in particular cases find work opportunities that can be adapted to their specific roles within their families and communities.

Principle 1: Compliance with the law (low level of risk)

1.1 There are no identified major risks in terms of compliance with the law.
1.2 There is a risk relating to Mexico's strict accounting regulations governing non-profits. These require all expenditures to be backed by fiscal receipts, which can only be emitted by people and businesses registered in the National Tax Administration Agency. Mexico has a massive, unregistered informal economy, and in the *Wixárika* region, there are almost no people or businesses registered. This means that complying with administrative regulations involves a great amount of work when trying to hire locally, as the program intends on doing. This is a manageable risk but is likely to entail a very considerable amount of work.

Principle 2: Access and Equity (low level of risk)

2.1 The program's primary goal is to achieve universal water access, so in principle, there should be no one excluded. The more water-scarce villages and hamlets would be given priority and attention first, but all interested communities and persons would become beneficiaries.
2.2 There are risks in terms of secondary benefits of the program, particularly around employment. The *Wixárika* region has minimal access to paid work, and stable, formal employment is almost non-existent. This program will generate local paid jobs in the forms of rainwater harvesting technicians, community workers, landscape workers, etc. It is easy for the more vulnerable or marginalised members of the communities to be excluded from accessing these positions for various reasons, including living in particularly remote spots, lacking basic necessary technical, organisational, or language skills, being overwhelmed by childbearing duties, not being allowed to participate by a controlling partner, or simply not having the self-confidence to apply. Mitigating these risks will require the careful design and execution of application, recruiting, training, and support procedures that allow equitable access and participation in the program.
2.3 The organisation is fully committed to serving the communities and integrating its work teams with no favouritism or discrimination, except for the prioritisation of participation by women, whose general conditions of greater marginalisation requires some preferential attention.
2.4 There is a risk that the absolute most vulnerable people may be left out from receiving rainwater harvesting systems when they do not have homes of their own on which they can be installed. This is a very difficult risk to mitigate. All attempts will be made to include these most vulnerable people, by hiring them, or by ensuring they have access to water through the schools or other public systems.

Principle 3: Marginalised and Vulnerable Groups (low level of risk)

3.1 The entire program takes place in the context of a highly marginalised indigenous nation, so the entirety of its impacts will be felt by them.

3.2 The *Wixárika* people live in conditions of high marginalisation from the broader Mexican national community, with minimal public services. It is precisely this lack of access that the program seeks to address.

3.4 Within the target population, there are groups that are particularly vulnerable, among whom are women, single mothers, and young adults, all of whom have little power or clout in the communities relative to other sectors of the population. The program seeks to integrate these parts of the population especially, by intentionally recruiting them into the teams that will work on program implementation. The main risk is that these vulnerable people might not be easily integrated into the program teams because of various factors (such as being prevented from doing so by a controlling spouse, by shyness or lack of confidence, etc). Mitigating this will require intentional outreach, training, and support.

Principle 4: Human Rights (low level of risk)

4.1 No risks identified

Principle 5: *Gender Equality and Women's Empowerment* (low level of risk)

5.1 Women tend to be the more vulnerable or marginalised members of *Wixárika* communities, particularly when they are single mothers or have alcoholic and/or abusive spouses. Women will not be excluded from the program's primary benefit of providing water access in the homes. On the contrary, women will be among the main beneficiaries of this, since the task of water collection and hauling falls primarily on them.

5.2 There is a real risk that women could be excluded from participating fully as employed members of the program, for various reasons mentioned earlier. Mitigating this risk will require carefully designing the recruiting, application, training, and support processes to facilitate their participation. The program executing team is fully committed to making this happen.

Principle 6: Core Labour Rights (low level of risk)

6.1 No risks identified. All hiring of community members by the program will be done in observance to national labour laws, ILO standards, and ethical practices.

Principle 7: Indigenous Peoples (low level of risk)

7.1 The entirety of the program takes place within the territory of the *Wixárika* Nation, an indigenous group that maintains a high degree of self-governance. The *Wixárika* community will be the beneficiaries of the program, and *Wixárika* people will make up most of the team. Already, the team currently working in Ha Ta Tukari (the existing program that this program will greatly scale up) is made up by approximately 60% *Wixárika* persons.

7.2 At each step in its development, the current program has been and will continue to be carried out in consultation with local *Wixárika* authorities. Every time it has been extended to a new village or hamlet, it has been after the direct request of the local authorities, and after a community meeting in which the work has been presented and explained, and the community accepted. These meetings are led by *Wixárika* members of the Ha Ta Tukari team and are done in both Spanish and *Wixárika*. The program will continue working in this manner, with explicit and informed consent from local authorities, and every individual beneficiary family.

7.3 The program also counts on support from the Institute of Indigenous Peoples of Jalisco State, which includes *Wixárika* staff, and maintains constant communication and relations with the *Wixárika* traditional government.

7.4 The central traditional government of San Andrés Cohamiata will be consulted at every stage of the development of the program, as well as in the final design of the proposal, as they have been.

7.5 The Local authorities of San Andrés Cohamiata have produced and published a written set of guidelines and procedures for organisations wishing to work within the territory. The chief writer of this document is a close ally of the current program, and will provide his support in ensuring that these procedures are perfectly understood and followed by the team.

7.6 The team will do everything to be fully consistent with UNDRIP and work with FPIC at all stages.

Principle 8: Involuntary Resettlement (low level of risk)

8.1 No resettlement whatsoever, voluntary or not, is anticipated in the execution of this program

Principle 9: Protection of Natural Habitats (low level of risk)

9.1 Part of the program involves landscape water harvesting work intended to allow greater water retention and infiltration, and reduction of soil loss and erosion. This involves some alteration of the terrain, but not any conversion of natural habitat to other land use. It does include the digging of keylines and other types of trenches for water and soil retention, and improvement of agricultural lands by the planting of vegetation lines along swales and trenches, in order to combat the desertification that threatens the region.

9.2 In order to avoid causing unwitting harm to the local ecosystems, interventions in the landscape will focus on already degraded lands, and will be designed with experts on landscape water management, ecology, and with the local population, taking into full consideration biological diversity and habitats, as well as culturally and spiritually important sites and features.

Principle 10: Conservation of Biological Diversity (low level of risk)

10.1 No negative impacts on biological diversity are anticipated. On the contrary, the program will seek to rehabilitate degraded lands and soils, regenerate local ecosystems, and increase the populations of native species that have been pressured by desertification and land degradation over the past decades.

10.2 No invasive species will be introduced, and all reforestation-revegetation efforts will focus on native species and possibly non-invasive agricultural plants, where appropriate, selected in consultation with the local population, ecologists, and agronomists with a strong understanding of the local biome.

10.3 It is worth noting that two current members of the team are scientists with advanced degrees in ecology, who know the region well and have a solid understanding of the biodiversity present. The team also maintains contact with the National Forestry Commission of Mexico (CONAFOR) who are available to support with recommendations on species selection.

Principle 11: Climate Change (low level of risk)

11.1 The program will not result in significant emissions or other drivers of climate change, but rather seeks to combat the desertification that is being driven by climate change as well as land use changes, through the rehabilitation of degraded lands.

Principle 12: Pollution Prevention and Resource Efficiency (low level of risk)

12.1 The program does not involve significant use of polluting chemicals or products. The installation of rainwater harvesting systems involved the use of plastic components, such as geomembranes, pipes, and other components, but these will be long-lived and low toxicity plastics, mainly UV treated, food grade polyethylene, which has a very long lifespan, and very low toxicity, being the type of plastic used for water storage around the world.

Principle 13: Public Health (low level of risk)

13.1 The principal risk to public health would be failure of the rainwater harvesting systems to produce drinking water of acceptable quality, or the contamination of the water in any given tank from bird droppings, or the entry of animals. This risk is mitigated by the use of well tested rainwater harvesting system designs, known to be able to produce quality drinking water, by the testing of water quality throughout the program, by training the beneficiary population on best practices for safe water collection and storage, and by the addition of filters where needed. Best practices on water harvesting and storage laid out by the Secretary of Social Development, the WHO, the American Rainwater Catchment Systems Association, and the National Water Commission will be taken into account.

13.2 It is worth noting that, although poorly stored or harvested rainwater presents a real health risk, the current state of affairs, in which untreated surface water is hauled for human consumption from open and unprotected sources, often shared with animals, is potentially a much greater risk, and the use of safely harvested and stored rainwater in the homes is much more likely to reduce health risks than to produce them.

Principle 14: Physical and Cultural Heritage (low level of risk)

14.1 No cultural or historic objects, sites, buildings, etc., will be removed or destroyed in the realisation of this program. All restoration and water retention work that affects the landscape itself will be designed and planned in close collaboration with the local authorities and community members to ensure that no sacred places are inadvertently altered. Many water springs are considered sacred and hold a fundamental place in *Wixárika* spiritual practice, the program will significantly contribute to their conservation.

Principle 15: Lands and Soil Conservation (low level of risk)

15.1 The *Wixárika* region has a rocky landscape with thin soils, steep inclines, and receives torrential rains during a monsoon season, followed by intense drought. These factors contribute to a high degree of vulnerability to erosion and desertification. Productive land is scarce, with few arable spaces. The traditional model of land use, in which forest would be felled and converted for agriculture, used for a few years, and then allowed to be reclaimed by the forest, are no longer sustainable with the much larger populations present today. Much of the territory has been significantly degraded, both by this type of conversion from forest to marginal agricultural land, as well as from massive logging ventures that were imposed decades ago on the *Wixárika*, and from which the local forests have never fully recovered.

15.2 This program seeks to begin a process of landscape rehabilitation, in order to combat the erosion and desertification that affect the area. The program will carry out works designed to retain water and soil through the digging of trenches, swales, and ponds, and through the reforestation of native tree and shrub species. It will also work to increase the soil and water retention of the agricultural lands, in order to improve their overall health and fertility and allow them to remain viable long term and not erode down to the underlying clay and rocky layers.

15.3 There is risk that in intervening the landscape, local erosion can be made worse, for example by the digging of keylines and trenches with excessive grades. The program will seek to mitigate these risks by working with highly experienced landscape water management experts, and by closely monitoring the changes in water and soil flows.

The Ha Ta Tukari program falls under “Category C” of the Environmental and Social Policy of the Adaptation Fund, since it has no adverse environmental or social impacts on the *Wixárika* community or environment, as shown in the following screening of each potential risk and impact according to the ESP (the level of risk is always low or simply non-existent).

Risks and impacts according to the ESP

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	X	
Access and Equity	X	
Marginalised and Vulnerable Groups	X	
Human Rights	X	
Gender Equality and Women's Empowerment	X	
Core Labour Rights	X	
Indigenous Peoples	X	
Involuntary Resettlement	X	
Protection of Natural Habitats	X	
Conservation of Biological Diversity	X	
Climate Change	X	
Pollution Prevention and Resource Efficiency	X	
Public Health	X	
Physical and Cultural Heritage	X	
Lands and Soil Conservation	X	

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for programme implementation.

Arrangements for Programme Implementation are based on the close collaboration and communication between a few interconnected organizational structures with clear roles and responsibilities.

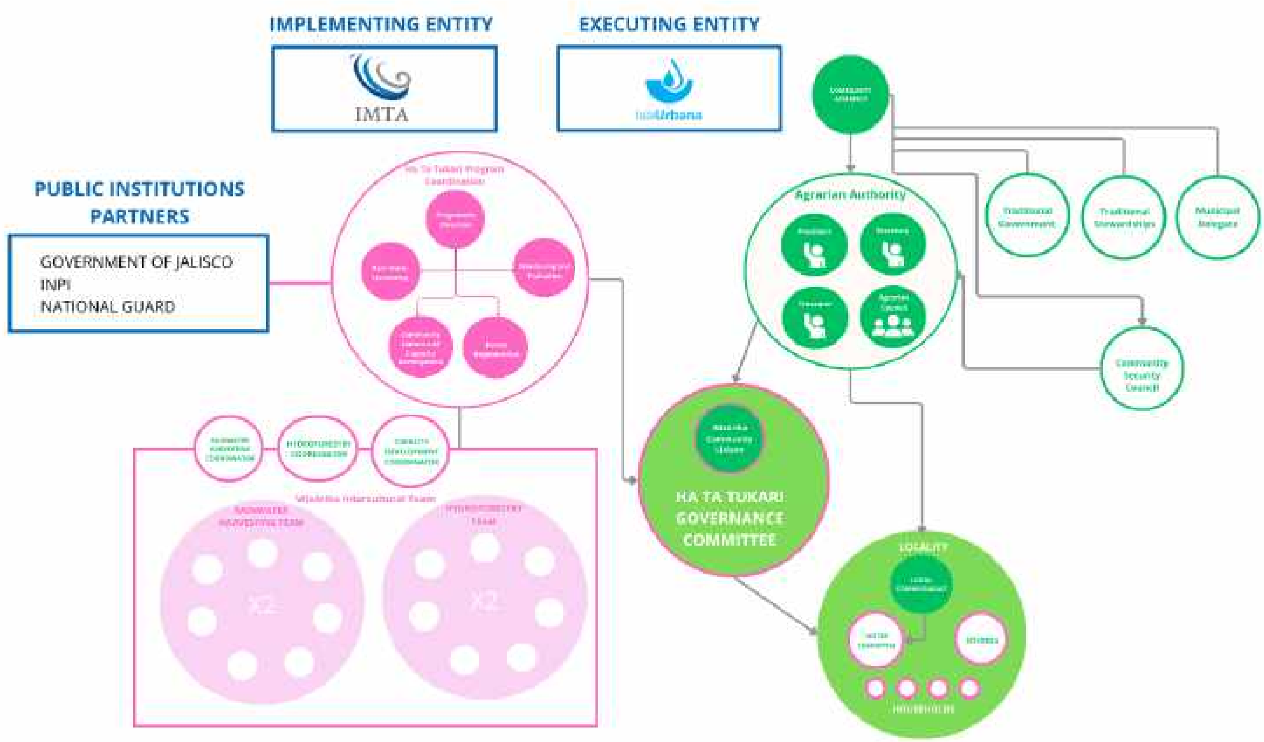
The organisational centre of the programme will be the Ha Ta Tukari Program Coordination Team. This group will be responsible for ensuring programme outcomes across all goals and objectives, and of managing the multiple collaborations involved. It is made up principally by personnel from Isla Urbana/Lluvia Para Todos and La Ventana Infinita who co-founded and developed Ha Ta Tukari, working very closely with key allies IMTA and SARAR, and with the Wixárika community itself.

Participation of the Wixárika community occurs through the entire programme and includes the autonomous government authorities -chiefly the Community Assembly of Tatei Kie and its delegates from each town and village. These locally elected officers are the highest secular authority and are empowered to organise community wide efforts and make commitments on their behalf. They are key allies in the project and have been consulted throughout the process of designing it.

Crucially, the team which will build and install the Rainwater tanks, lead the community efforts to regenerate the forests, and who will teach the children and adults of the whole community how to do all of this, will be made up almost entirely by local young Wixárika men and women. The existing and already highly trained and experienced Wixárika Intercultural Team will be the frame on which the larger team will be built.

The specific roles of the key players are outlined in the figure below (figure 13):

Figure 13. *Programme Key Players and Roles*



The Mexican Institute of Water Technology (IMTA) will act as the Implementing Entity. They will oversee the activities conducted by the Executing Entity, ensuring the technical robustness of the programme, and will assist in designing and implementing a monitoring plan, focusing in particular on measuring the quality of water consumed in households.

The Tatei kie Community Assembly Is the highest secular authority for the community of San Andrés Cohamiata with its 21 towns and villages. It is presided by an elected body called the Commissary of Communal Lands, or the Agrarian Authority, made up by a president, secretary, treasurer, and council. This body has an elected representative in each locality, each with their own small team. The Community Assembly must approve any project that takes place in the territory, they can make agreements and commitments, and they can organize community efforts.

Lluvia para Todos A.C. (Isla Urbana) serves as the Executing Entity. Its main functions are to orchestrate and coordinate the programme, oversee the multiple teams working on each aspect of it, manage the collaborations with the multiple partners, and provide the technical capacities and experience in relation to Rainwater Harvesting.

La Ventana Infinita is a cofounder of Ha Ta Tukari, leading education and various forms of training within the program. It forms part of the central Programme Coordination together with Lluvia Para Todos and SARAR, in charge of overall programme implementation. They bring capacities and experience in the design and execution of training processes, both for the team itself, as well as for the beneficiary populations.

SARAR is a key collaborator, bringing decades of experience in decentralized, ecological sanitation, water management, and community organization. SARAR personnel will be in charge of overseeing the forest regeneration and agroforestry aspects of the programme, and will serve on the central Programme Coordination Team.

The Central Programme Coordination Team is made up of a General Director and four management roles: the RainWater Harvesting Director, the Forest Regeneration Direction, the Community Liaison and Capacity Development Direction, and finally the Monitoring and Evaluation Direction (Table x).

The Central Programme Coordination Team includes a General Director and four key management roles:

- **General Direction:** Oversees the entire programme, ensuring communication and coordination amongst key leadership and staff, representing the project before local authorities, funders and allies, and supporting the programme to achieve its key outputs and outcomes across components.
- **RainWater Harvesting Direction:** Drives all strategic and technical decision-making when it comes to RWHS installation, oversees field technicians, as well as recruitment and training.
- **Forest Regeneration Direction:** Drives all strategic and technical decision-making when it comes to landscape-scale water management, facilitates learning processes related to forest regeneration, designs technical training, and monitors implementation.
- **Community Liaison and Capacity Development Direction:** Designs and drives Component 3 of the programme, managing the training of the Intercultural team, and overseeing the production of all capacity building materials.

- **Monitoring and Evaluation Direction:** Leads all M, E & L activities including data collection and analysis, overseeing field technicians, and preparing progress and impact reports.

The Ha Ta Tukari Governance Committee functions as a kind of board for the various stakeholders to communicate, make decisions and co-create the programme. The Committee will include the Central Program Coordination Team, the representatives of the Tatei Kie Communal Assembly, representatives of the *Wixárika* Intercultural Team, and whoever else the community considers relevant to the joint implementation of the programme. We will actively work to ensure that this committee has representation from across Wixárika society, including often underrepresented groups, and that the voice of women in particular figures prominently.

Wixárika Community Liaison: During the first Ha Ta Tukari Governance Committee meeting, local authorities will be encouraged to appoint a Liaison. This individual will be responsible for conveying decisions from the Committee to the Intercultural Team Coordinators and the local community authorities involved in the programme.

The *Wixárika* Intercultural Team, composed of local *Wixárika* people, will actively contribute to this project. The team consists of local coordinators and two fieldwork teams:

- **Field Coordinators**: Responsible for overseeing three key activities—RWHS (Rainwater Harvesting System) installation, forest regeneration, and local capacity building.
- **Rainwater Harvesting Team**: Responsible for installing RWHS and training households how to use and maintain their systems, as well as data collection and other M&E activities.
- **Hydroforestry Team**: Responsible for implementing forest regeneration activities and training others to do so, as well as soil sampling and other M&E activities.

Table 7. Composition of the Wixárika intercultural team

Position	Description
Field Coordinators (RWHS, Regeneration; Capacity Building)	Coordinates the local team in the field and is the liaison with the Central Programme Coordination and the *Wixárika* Operations Coordinator. Is responsible for contact with local authorities, for convening meetings with the community and for establishing community agreements. There will be a coordinator for the Rainwater Harvesting Team, one for the Hydroforestry Team, and another for Capacity Building activities.
Field Technicians	Are primarily responsible for collecting, verifying, and delivering diagnostic and monitoring information for the Rainwater Harvesting, Hydroforestry, and Capacity Building activities.
RWHS Technician	Will be trained to install, repair, and give maintenance to RWHS. The people working in this role will need to master the use of a wide range of tools, from the basic hand and power tools to more sophisticated equipment for geomembrane welding and concrete casting. They will be expected to develop strong team-working skills, and other soft skills to work with the beneficiaries.
Forest Regeneration Specialised Technician	Possesses a deep understanding of the technical and social foundations of comprehensive forest ecosystem regeneration. Designs and coordinates field systems tailored to various types of terrain, with a strong emphasis on team safety as a core principle of fieldwork. Leads

	hydroforestry regeneration projects in collaboration with community members, contributes to the training of local technicians, and oversees the collection and systematisation of real-time data on the progress of technical implementation.
Forest regeneration trained technicians	Possesses expertise in forest ecosystem regeneration. Ensures the availability and mobilisation of materials for community-led regeneration activities. Leads technical implementation with community participants, collects real-time progress data, and oversees agroforestry nurseries.
Socio-educational facilitator	Implements workshops and participatory activities in homes, schools and community spaces for the construction of community agreements and collective decision-making for the sustainable management of the landscape. Collaborates with Intercultural team technicians in technical training for the population. Supports community art projects aimed at the adoption of the implemented actions.
Operations Technician	This role can be filled by any qualified team member for additional compensation. Responsible for tasks such as driving and maintaining vehicles, inventorying warehouse and home base equipment, tracking freight and material distribution, etc. Will be responsible for the team's tools, equipment, vehicles, and materials, as well as for keeping close communications with the other teams and coordinators in the project.

Our main **external alliances** are with public institutions. We have cultivated good relations with, and have received non-economic forms of assistance of various kinds from the State Government of Jalisco, the National Institute for Indigenous Peoples (INPI), the State Commission for the Development of Indigenous Peoples (CEDPI), and the National Guard, among several others.

B. Describe the measures for financial and program/programme risk management.

Table 8. Risk management

Risk	Initial risk assessment (H = high, M = moderate, L = low)	Proposed mitigation measure	Final risk assessment
Financial - Currency and cost fluctuations	**M**	All budgets will be in US$- we have assumed an exchange rate of $17.5 MXN to $1 USD in order to mitigate the risk of fluctuations in the exchange rate that we have seen in recent years. Where possible, a clause will be included in contracts with private sector providers that they can't	**L**

		increase the costs during the contract duration once the contract has been signed. We have a miscellaneous materials line of 10% to cover fluctuations in the cost of materials should prices of key RWHS costs increase.	
Financial - *Wixárika* have limited budgetary and administrative capacity	**M**	We will work with the Agrarian Authorities and other community leadership to co-design an effective means of employing members of the community that both obeys Mexico's strict employment law but is feasible in the very remote and limited region where the programme will be taking place. We have also sought advice from the Jalisco Government's Indigenous Peoples Bureau to understand how similar programmes have managed limited budgetary and administrative capacities but still offered the types of opportunities this programme aims to.	**L**
Operational - Security	**H**	Security in the region is a serious and ongoing concern. In recent years, competing organised crime organisations have been highly active along the highway that leads into the *Wixárika* region. We have developed protocols for travelling to and from the *Wixárika* Sierra, involving ongoing monitoring of conditions on the ground, security protocol training for the team, only-daytime driving, use of clearly marked vehicles, etc. We have received significant support from the National Guard and the State of Jalisco Police who have provided escorts to and from the region. Maintaining this support and relationships with federal and state government institutions is of highest priority. The security conditions along the highways leading to the Sierra constitute the highest risk to the project, and although the programme team will do its utmost to mitigate this risk, conditions are such that this will likely remain an active concern. Implementation times and strategies	**M**

		may require adjustments in response to changing conditions which is why we have designed an adaptive management and implementation plan that will allow for as much flexibility as possible to accommodate any necessary changes.	
Operational - Delays in implementation of programme activities	**L**	We will create two operational centres in the Sierra from which the RWHS Intercultural teams will operate to enable a wider geographical reach and reduce the likelihood delays are caused in installation if equipment should break/need repair, team members fall sick, etc. All teams have built in rest periods to ensure that timelines are realistic. We will be training more people than are technically needed to ensure that, if someone should no longer be available, the technical capacity will still be there. We have budgeted two sets of tools per team, to ensure the need for repair does not slow down implementation (given how remote the region is, it can take a long time to replace equipment).	**L**
Operational - Team Health and Safety	**M**	Regeneration activities do involve moving very large and heavy tree trunks. Health and Safety protocols will be put in place and strictly adhered to. Additionally a training program has already been designed, and budgeted, to train all those involved in regeneration activities. They will also be trained in specific health and safety protocols and first aid. All team members will also be carrying epi pens and snake and scorpion venom antidotes when working in forest areas.	**M**
Technical - Resistance to change and the use of new technologies	**L**	Given our 14 -year involvement with these isolated indigenous communities, we have already overcome suspicion and resistance when it comes to introducing a new technology. The *Wixárika* know and appreciate the advantages of RWH. However to ensure further ownership and sustainability, community	**L**

		members will need to bring in 10 percent of the value of their RWHS by committing labour to support the installation of their systems. Capacity building and training of communities will be undertaken to improve their awareness and understanding of the benefits of the activities, including infrastructure maintenance. Communities will be involved in program implementation/decision making throughout the program. In depth community consultations will continue to take place throughout. Infrastructure maintenance will be a key piece of the training, with a special focus on women who often hold the management of the household as a key responsibility.	

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

Table 9. Environmental and social risk management measures

Adaptation Fund Policy	Risk	Risk Management Measure
Principle 1: Compliance with the law (low level of risk)	There is a risk relating to Mexico's strict accounting regulations governing non-profits. These require all expenditures to be backed by fiscal receipts, which can only be emitted by people and businesses registered in the National Tax Administration Agency. Mexico has a massive, unregistered informal economy, and in the *Wixárika* region, there are almost no people or businesses registered. This means that complying with administrative regulations involves a great amount of work when trying to hire locally, as the program intends on doing.	This is a manageable risk but is likely to entail a very considerable amount of work. We have budgeted for an HR specialist to support in managing this part of the programme. We have consulted and will work closely with Jalisco Government's Indigenous People's Bureau to establish ways to comply with the law whilst also being able to undertake economic activities in the Sierra.
Principle 2: Access	There is no risk	

and Equity (low level of risk)		
Principle 3: Marginalised and Vulnerable Groups (low level of risk)	There is a risk that the absolute most vulnerable people may be left out from receiving rainwater harvesting systems when they do not have homes of their own on which they can be installed.	All attempts will be made to include these most vulnerable people, by hiring them, or by ensuring they have access to water through the schools or other public systems.
Principle 4: Human Rights (low level of risk)	There is no risk	
Principle 5: Gender Equality and Women's Empowerment (low level of risk)	There is a real risk that women could be excluded from participating fully as employed members of the program, for various reasons mentioned earlier.	Mitigating this risk will require carefully designing the recruiting, application, training, and support processes to facilitate their participation. The program executing team is fully committed to making this happen.
Principle 6: Core Labour Rights (low level of risk)	There is no risk	
Principle 7: Indigenous Peoples (low level of risk)	The Local authorities of San Andrés Cohamiata have produced and published a written set of guidelines and procedures for organisations wishing to work within the territory. The chief writer of this document is a close ally of the current program, and will provide his support in ensuring that these procedures are perfectly understood and followed by the team.	
Principle 8: Involuntary Resettlement (low level of risk)	There is no risk.	
Principle 9: Protection of Natural Habitats (low level of risk)	There is no risk.	

Principle 10: Conservation of Biological Diversity (low level of risk)	The programme will be proactively seeking to increase the amount and variety of biomass in the soil of 700 forest hectares.	
Principle 11: Climate Change (low level of risk)	The programme has focused on reducing the vulnerability of the population to the effects of climate change and will not significantly or unjustifiably increase greenhouse gas emissions or other drivers of climate change.	
Principle 12: Pollution Prevention and Resource Efficiency (low level of risk)	There is a minimal risk that materials used in the construction of the RWHS tanks - geomembrane and concrete- could be improperly disposed of.	Waste management protocols will be designed and put in place to ensure we do not pollute the environment in which the programme is taking place.
Principle 13: Public Health (low level of risk)	There is a very low level of risk to public health from improperly disinfected water (they are currently at a higher level of risk from untreated open water sources in the landscape shared with animals)	The community will be provided with disinfection drops to purify the water in their RWHS tanks and extensively trained to use them.
Principle 14: Physical and Cultural Heritage (low level of risk)	There is no risk.	
Principle 15: Lands and Soil Conservation (low level of risk)	There is no risk.	

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan, in compliance with the ESP and the Gender Policy of the Adaptation Fund.

This Monitoring and Evaluation (M&E) plan outlines the framework for tracking the progress and assessing the outcomes of this phase of the Ha Ta Tukari programme. The plan ensures that all identified environmental and social risks are monitored, evaluated, and managed in compliance with the Adaptation Fund's Environmental and Social Policy (ESP) and Gender Policy as well as supporting all parties involved in the programme’s implementation to learn, and course correct where necessary to ensure the most effective use of resources and the most impactful outcomes possible.

Objectives

- To monitor the impact of all key programme activities within and across technical components, tracking them against expected outputs and outcomes.
- To support the use of data produced to enhance learning at key moments in the life of the programme.
- To evaluate the programme's impact at mid-term and terminal stages.
- To report on the status of risk management, including corrective actions taken, in the annual Project/Programme Performance Reports (PPRs).

Monitoring Plan

Component-Specific Monitoring

- Component 1: Rainwater Harvesting Systems
  - Monitoring Indicators: Number of RWHS installed, system maintenance effectiveness, water quality.
  - Data Collection: Regular site inspections, beneficiary surveys.
  - Responsibility: Executing Entity (EE) with direct input from the *Wixárika* Intercultural Team.
  - ***[Water Quality testing will be done by the Implementing Entity]***
- Component 2: Landscape-scale Water Management and Regeneration
  - Monitoring Indicators: Area of land restored, biodiversity levels (measured using the Normalised Difference Vegetation Index (NDVI[4]), number of litres of water retained in the soil.
  - Data Collection: Soil sampling, field surveys, drone photographs and videos and community feedback.
  - Responsibility: The EE in collaboration with environmental experts and local communities.
- Component 3: Capacity Building and Knowledge Management
  - Monitoring Indicators: Number of training sessions conducted, participant knowledge retention, application of learned skills.
  - Data Collection: Training evaluations, follow-up surveys, and case studies.
  - Responsibility: The EE with support from training providers and the Intercultural Team
- Component 4: Community-Led Universal Water Coverage Model Development
  - This component is a knowledge management and communications component and as such will be focused on using the data and lessons generated by the first 3 components to feed into a toolkit and model for universal water coverage that will be a final programme deliverable.

Annual Programme Performance Reports (PPRs)

- **Content:**
  - Progress and impact of each programme component.
  - Status of implementation against all key elements of the Adaptation Fund's ESP and where necessary outline ESP Management Plans to mitigate any risks identified during implementation.
  - Description of any corrective actions taken or required.
- **Reporting Schedule:**
  - Annual reports will be submitted to the Adaptation Fund at the end of each calendar year.
  - **Responsibility:** The EE will compile and submit the reports with inputs from all relevant stakeholders.
  - In addition to these reports, the EE will provide any other reports requested by the IE or the Adaptation Fund. We are also contemplating the presentation of Quarterly Reports by Technical Specialists where useful.

[4] Over the last decade, the NDVI has proven extremely useful in predicting herbivore and non-herbivore distribution, abundance and life history traits in space and time.

Stakeholder Engagement

- **Involvement:**
    - The Ha Ta Tukari Governance Committee
- **Communication:**
    - Regular updates on the progress and impact of each component will be communicated to stakeholders through the Ha Ta Tukari Governance Committee which will meet twice a year to oversee programme progress, lessons learned and course corrections needed. These will be used for bi-annual progress reports

Learning

Learning will be a key piece of the M&E Framework. It's crucial that the insights gained from this process inform strategic development and the design of the programme, with lessons actively integrated back into their implementation. This approach is essential for identifying and managing risks effectively, ensuring that the expected outcomes are achieved within available resources.

Evaluation

- **Technical Support**

The Mexican Institute of Water Technology (IMTA) is a decentralized public organization that focuses on facing national and regional challenges associated with water management and outlining new approaches to technological research and development to protect the resource and allocate it appropriately, efficient and equitable among different users. IMTA, as an institution with extensive experience in appropriate technologies, watershed conservation, water quality, social participation, and governance, will provide specialized technical support. This role will include conducting water quality analyses, utilizing its facilities and laboratories, as well as its expertise and capabilities to ensure that the harvested water meets national quality standards, guaranteeing that it is safe for human consumption and suitable for the Wixárika communities. In addition, IMTA will offer essential technical expertise to ensure that the technologies applied in rainwater harvesting and landscape regeneration are effective and suitably adapted to the specific needs of the Wixárika communities, thereby contributing to the region's water and environmental resilience.

Specifically this includes travel, sampling and laboratories for water quality tests; project supervision missions; steering committee meetings, and project evaluation reports.

- **Financial Support**

IMTA will oversee and provide financial support during the execution of the project's works and activities. Its role will include supervising and optimizing the allocated resources, ensuring that each component of the project is executed according to the submitted plan and within the established budget. Additionally, IMTA will ensure that financial resources are managed with transparency and accountability.

The related activities include to ensure compliance with audit requirements, project financial reports, and the project financial audit.

Table 10. Monitoring and Evaluation Budget

Items	Responsible Party	Amount	Timing
Component 2 Soil sampling, NDVI sampling, field capacity sampling (water retention)	Executing Entity	Total cost of materials: $68,838 (these are integrated into Component 2's budget)	Throughout the project lifetime: Soil sampling - Every 6 months NDVI - monthly Field capacity - every 3 months
Data collection in the field for Components 1, 2, 3 and 4	Executing Entity	Field M&E staff salaries - $140,400 - these are integrated into Component 4 - Knowledge Management's budget	Throughout the project lifetime
Data Analysis for reports and learning	Executing Entity	$25,143	Throughout the project lifetime
Annual Programme Performance Reports (PPRs)	Executing Entity	$130,114	Every year (with some shorter reports produced every semester)
Water Quality Testing	Implementing Entity (IMTA)	$282,027	Every 6 months (beginning in the second year)
Technical accompaniment	Implementing Entity (IMTA)	$219,355	Throughout the project lifetime
Programmatic audits	Implementing Entity (IMTA)	$125,345	Every year

A. **Include a results framework for the program proposal, including milestones, targets and indicators, including one or more core outcome indicators of the Adaptation Fund Results Framework, and in compliance with the Gender Policy of the Adaptation Fund.**

Table 11. Results Framework

Expected result	Indicator	Baseline	Targets	Means of verification	Frequency
Programme objective: Provide universal autonomous, renewable, and adaptive water access to the *Wixárika* people of the 21 communities in the San Andrés Cohamiata region of Mexico.	Number of beneficiaries with access to drinking water in their home *[AF Core Indicator: Number of Direct Beneficiaries]*	0	**5,100** (2,658 of which will be women and girls and 2,286 of which will be children)	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation
	Number of hectares where an adaptive landscape-scale water management approach has been implemented [*AF Core Indicator: Natural assets protected or rehabilitated*]	0	**700**	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation

Component 1: Establishing rainwater harvesting (RWH) infrastructure for sustainable and autonomous water access.						
Outcome 1.1 - 1,000 RWHS with 12,000 to 14,000 litres in storage capacity installed and in proper operation throughout San Andrés Cohamiata.	Output 1.1 - Implementation of 1,000 fully functioning RWHS in households.	Number of households with a fully functioning RWHS *[AF Core Indicator: Infrastructure Assets produced]*	0	**1000**	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation
		Number of beneficiaries with increased access to drinking water in their homes	0	**5100**	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation
Outcome 1.2 - 5,100 beneficiaries with increased access to drinking water, 2,658 of which will be women and girls, and 2,286 of which will be children		Number of household-level agreements signed	0	**1000**	Number of Agreements signed	Annual, Midterm Evaluation, Terminal Evaluation
Outcome 1.3 - Approximately 3,570 beneficiaries trained on the correct use and maintenance of RWHS.	Output 1.2 - Group and one-on-one training and agreements with users for the correct use and maintenance of the RWHS.	Number of beneficiaries trained on the correct use and maintenance of RWHS.	0	**3.750**	Technical visits and evaluations - 6 month reports	every 6 months, Annual, Terminal Evaluation
Component 2: Developing and piloting of a community action plan for landscape-scale water management and regeneration.						
Outcome 2.1 - Increased local capacities for landscape-scale water management and innovative agroforestry practices.	Output 2.1 - Community-driven design of a landscape-scale water management and agroforestry strategy for the *Wixárika* region.	Number of areas chosen for regeneration by the community	0	3	Workshop attendance lists/ community assembly lists/ project annual reports / evaluation	Annual, Midterm Evaluation, Terminal Evaluation

					reports	
Outcome 2.2 - Full adoption, maintenance and replication of ecosystem restoration activities and agroforestry practices.	Output 2.2 - 2,000 community members (2 per household receiving RWHS) participating in landscape-scale water management.	Number of community members participating in landscape-scale water management.	0	2000	Project Annual Reports, Evaluation Reports	Terminal Evaluation
Outcome 2.3 - Increased quantity of organic matter stored in the soil (measured using the Normalised Difference Vegetation Index (NDVI) of the 700 hectares undergoing regeneration.	Output 2.3 - 700 community-undergoing regenerated forest hectares.	Number of hectares where regeneration activities have taken place	0	700	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation
	Output 2.4 - 3 hectares cultivated under innovative agroforestry practices by 60 families.	Number of hectares with SAFS activities	0	3	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation
		Number of beneficiary families participating in agroforestry practices	0	60	Workshop Attendance lists/ Project annual reports, evaluation reports	Annual, Midterm Evaluation, Terminal Evaluation

	Output 2.5 - Increased values of NDVI in 700 hectares undergoing regeneration	% of total hectares with an increase of their NDVI values	-1	0/1	Infrared Maps,Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation
Outcome 2.4 - Increased number of litres of water retained in the soil of the 700 hectares undergoing regeneration.	Output 2.3 - 700 community-restored forest hectares.	Number of litres stored in soil per m2	0	16	Infiltrometer tests/ project annual reports, evaluation reports	Every six months, Annual, midterm evaluation, terminal evaluation
Component 3: Developing communities' capacities for sustainable water management.						
Outcome 3.1 - The *Wixárika* community co-design and co-implement an autonomous water management strategy in their landscape	Output 3.1 - A methodology for community participation and collaboration that ensures community acceptance and ownership of the programme, designed and implemented.	Number of workshops and trainings delivered	0	160	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation

Outcome 3.2 - Community-wide awareness and sustainable adoption of RWHS, landscape regeneration, hygiene and safe water management practices.	Output 3.2 - A learning programme to promote RWH adoption, hygiene, environmental regeneration, and climate change resilience implemented with 3,570 beneficiaries. (70% of programme beneficiaries, discounting 30% for infants and elderly beneficiaries who will not participate in maintenance activities)	Number of beneficiaries trained	0	3570	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation
Outcome 3.3 - The Intercultural teams of 40 people have the technical know-how and capacity to install and maintain RWHS, regenerate forests and deliver educational activities for their community, scaling adaptive capacities across their communities.	Output 3.3 - A certification programme for the local Intercultural Teams of 40 people to develop and strengthen local technical and educational facilitation capacities, delivered; supporting team members to become autonomous agents of change in their communities.	Number of local *Wixárika* community members trained	0	40	Project Annual Reports, Evaluation Reports	Annual, Midterm Evaluation, Terminal Evaluation

Component 4: Knowledge management and development of a model for community-led universal water coverage						
Outcome 4.1 - Development of an integrated model for rainwater harvesting systems and landscape water management, with the potential to be adapted and replicated in diverse rural settings across Mexico and the Global South, effectively addressing water scarcity and improving climate resilience in vulnerable communities.	Output 4.1 - Systematised documentation of all technical and community processes taking place during the programme, capturing lessons learned, data and all relevant information to be used for the final design of the model.	Learning sessions held between programme team and *Wixárika* community representatives	0	8	Bi-annual learning report	every 6 months
	Output 4.2 - Detailed manual/toolkit for the effective replication of community-led universal water coverage programmes	Number of manuals/toolkits created	0	1	Project Annual Reports, Evaluation Reports	Yearly, Terminal Evaluation
	Output 4.3 - A communications strategy to disseminate the impact of our community-led model for universal water coverage within and outside San Andrés Cohamiata.	Number of unique visitors to dedicated website	0	4000	Website analytics	Yearly
		Number of articles written about the project in major publications	0	4	Publications	Yearly, Terminal Evaluation

B. Demonstrate how the program/programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s)[1]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Programme objective: Provide universal autonomous, renewable, and adaptive water access to the *Wixárika* people of the 21 communities in the San Andrés Cohamiata region of Mexico.	Number of beneficiaries with access to drinking water in their home Number of hectares where an adaptive landscape-scale water management approach has been implemented	**Outcome 1.** *Reduced exposure to climate-related hazards and threats* **Outcome 4.** *Increased adaptive capacity within relevant development sector services and infrastructure assets* ***Outcome 5:*** *Increased ecosystem resilience in response to climate change and variability induced stress*	1.2.1. Percentage of target population covered by adequate risk-reduction systems 4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale) 5.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	**$7.999.991**
Component 1: Establishing rainwater harvesting (RWH) infrastructure for sustainable and autonomous water access.				
Build decentralised infrastructure for autonomous and safe water provision in households across the 21 communities of San Andres Cohamita.	Number of households with a fully functioning RWHS. Number of beneficiaries with increased access to drinking water in their homes. Number of household-level agreements signed.	**Outcome 1.** *Reduced exposure to climate-related hazards and threats* **Outcome 4.** *Increased adaptive capacity within relevant*	1.2.1. Percentage of target population covered by adequate risk-reduction systems 4.1.2. No. of physical assets strengthened or constructed to withstand	$4,089,491

	Number of beneficiaries trained on the correct use and maintenance of RWHS.	*development sector services and infrastructure assets*	conditions resulting from climate variability and change (by sector and scale)	
Component 2: Developing and piloting of a community action plan for landscape-scale water management and regeneration.				
To combat desertification by increasing water retention and infiltration in the landscape, enhancing biomass and vegetation cover, and reducing soil erosion through an innovative community action plan.	Number of areas chosen for regeneration by the community. Number of community members participating in landscape-scale water management. Number of hectares where regeneration activities have taken place. Number of hectares with SAFS activities. Number of beneficiary families participating in agroforestry practices. % of total hectares with an increase of their NDVI values Number of litres stored in soil per m2	**Outcome 5.** *Increased ecosystem resilience in response to climate change and variability-induced stress* **Outcome 3.** *Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level*	5.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale) 3.2. Percentage of targeted population applying appropriate adaptation responses 3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge	$1,177,877
Component 3: Developing communities' capacities for sustainable water management.				
To provide the *Wixárika* community with the tools, technologies and techniques to implement and manage their autonomous water systems and landscape regeneration strategies; ensuring the expansion and sustainability of the programme's overall impact through the fostering of	Number of workshops and trainings delivered. Number of beneficiaries trained. Number of local *Wixárika* community members trained	**Outcome 3.** 'Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses 3.2. Percentage of targeted population applying appropriate adaptation responses 3.2.2 No. of tools and guidelines	$821,205

community ownership.			developed (thematic, sectoral, institutional) and shared with relevant stakeholders	
Component 4: Knowledge management and development of a model for community-led universal water coverage				
Systematize and document programmatic learning and knowledge to develop a model for community-led universal water coverage.	Number of learning sessions held between programme team and *Wixárika* community representatives. Number of manuals/toolkits created. Number of unique visitors to dedicated website. Number of articles written about the project in major publications	**Outcome 8.** *Support the development and diffusion of innovative adaptation practices, tools and technologies.*	8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated 8.2. No. of key findings on effective, efficient adaptation practices, products and technologies generated	$600,634

C. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs

Table 12. Detailed Budget

Project Components	Expected Concrete Outputs	Total	Year 1		Year 2		Year 3		Year 4		%
			6 m	6 m	6 m	6 m	6 m	6 m	6 m	6 m	
Component 1 Establishing rainwater harvesting (RWH) infrastructure for sustainable and autonomous water access.	**Output 1.1** Implementation of 1,000 fully functioning RWH systems in households	**$3.885.080**	$274.922	$579.355	$610.026	$610.026	$610.026	$610.026	$529.35 5	$61.342	58,08%
	Output 1.2 Group and one-on-one training and agreements with users for the correct use and maintenance of the RWHS.	**$204.411**		$20.447	$20.447	$36.793	$36.793	$36.793	$36.793	$16.345	3,06%
Component 2 Developing and piloting of a community action plan for landscape-scale water management.	**Output 2.1** Community-driven design of a landscape-scale water management and agroforestry strategy for the *Wixárika* region.	**$60.404**	$60.404								0,90%
	Output 2.2 2,000 community members trained (2 per household receiving RWHS) and delivering landscape-scale water management.	**$211.414**	$30.202	$30.202	$30.202	$30.202	$30.202	$30.202	$30.202		3,16%
	Output 2.3 700 undergoing community-restored forest hectares.	**$392.626**		$30.202	$60.404	$60.404	$90.606	$90.606	$60.404		5,87%
	Output 2.4 3 hectares cultivated under innovative agroforestry practices by 60 families.	**$513.434**	$15.101	$75.505	$60.404	$90.606	$60.404	$90.606	$60.404	$60.404	7,68%

Component 3 Developing communities' capacities for sustainable water management.	**Output 3.1** A methodology for community participation and collaboration that ensures community acceptance and ownership of the programme, designed and implemented.	**$369.542**	$82.121	$76.255	$35.195	$35.195	$35.195	$35.195	$35.195	$35.195	5,52%
	Output 3.2 A learning programme to promote RWH adoption, hygiene, environmental regeneration, and climate change resilience implemented with 3,570 beneficiaries. (70% of programme beneficiaries, discounting 30% for infants and elderly beneficiaries who will not participate in maintenance activities)	**$369.542**		$35.195	$76.255	$35.195	$76.255	$35.195	$76.255	$35.195	5,52%
	Output 3.3 A certification programme for the local Intercultural Teams of 40 people to develop and strengthen local technical and educational facilitation capacities, delivered; supporting team members to become autonomous agents of change in their communities.	**$82.121**	$41.060		$41.060						1,23%
Component 4 Knowledge management and development of a model for community-led universal water coverage	**Output 4.1** Systematised documentation of all technical and community processes taking place during the programme, capturing lessons learned, data and all relevant information to be used for the final design of the model.	**$504.532**	$24.025	$24.025	$96.101	$96.101	$72.076	$96.101		$96.101	7,54%

	Output 4.2 Detailed manual/toolkit for the effective replication of community-led universal water coverage programmes.	**$48.051**						$24.025		$24.025	0,72%
	Output 4.3 A communications strategy to disseminate the impact of our community-led model for universal water coverage within and outside San Andrés Cohamiata.	**$48.051**						$24.025		$24.025	0,72%
Sub-total Programme Costs		**$6.689.207**	**$527.835**	**$871.186**	**$1.030.095**	**$994.521**	**$1.011.556**	**$1.072.774**	**$828.607**	**$352.633**	**100,00 %**
Project Execution Costs	Programme Staff	**$618.914**	$77.364	$77.364	$77.364	$77.364	$77.364	$77.364	$77.364	$77.364	
	Travel Related to Execution	**$65.143**	$8.143	$8.143	$8.143	$8.143	$8.143	$8.143	$8.143	$8.143	
Sub-total Project Execution Costs		**$684.057**	**$85.507**	**$77.364**	**$77.364**	**$77.364**	**$77.364**	**$77.364**	**$77.364**	**$77.364**	
Total Project Costs		**$7.373.264**	**$613.342**	**$948.550**	**$1.107.459**	**$1.071.886**	**$1.088.921**	**$1.150.138**	**$905.971**	**$429.997**	
Implementing Entity Fee (8,5%)		**$626.727**	**$27.420**	**$58.755**	**$74.424**	**$105.760**	**$74.424**	**$105.760**	**$74.424**	**$105.760**	
Amount of Financing Requested		**$7.999.991**									

Table 13 - Budget notes

Activities related to the Component	Budget Notes	Budget
Component 1: Establishing rainwater harvesting (RWH) infrastructure for sustainable and autonomous water access. Overall cost for this component includes a full salary for a RWHS component director, salaries for the *Wixárika* Rainwater Harvesting Teams (High skill and low skill), salaries for the logistics team, tools and materials for RWHS installation, and a percentage of general project needs, including two 2 ½ ton trucks and one pick-up truck.		
1.1 Implementation of 1,000 fully functioning RWH systems in households		
Logistics preparation for the implementation phase / creation of Operation Centres	Cost includes the establishment of two strategic operation centres for RWHS installation that will include a warehouse to store materials and tools, an office space, a kitchen and bathrooms. Also, this will cover capacity building activities that will take place during the first months of the project.	$163.580
Community meetings with traditional, communal, and religious authorities, as well as end-users	Cost includes carrying out meetings with local authorities and inhabitants to define the nature of new partnerships, roles and responsibilities, presenting the Project's Operating Rules and Conditions, and introducing the practice of RWH and the system's operation and maintenance.	$122.685
Creation of Community Governance Committees and co-participation agreements with local communities	Cost includes carrying out informative meetings to establish the terms of participation for beneficiaries throughout the entire project.	$122.685
Technical visits to installation sites to determine feasibility and specifications for each system, as well as beneficiary commitments regarding their operation and maintenance	Cost includes field visits for on-site evaluation infrastructure to analyse the feasibility of installing the RWHS, creation of a tailored list of materials, and establishing agreements with beneficiaries.	$204.475

Programming of rainwater harvesting system installations in homes	Cost includes the design of the implementation model, informative meetings with the beneficiaries regarding installation dates and timelines, and preparing installation materials along with the RWHS installation teams.	$122.685
Installation of 1,000 RWH systems in homes	Includes all the necessary tools and materials needed to build 500 RWHS with geomembrane tanks, and 500 RWHS with concrete tanks. Unit price for a geomembrane system is $2.906 and for a concrete system is $3.392. This cost includes all necessary components of the RWHS, tools and materials for installation, an average price for freights per system, colloidal silver for water purification, and the cost of the geomembrane and concrete cisterns. Each unit price has been multiplied by 500.	$3.148.971
1.2 Group and one-on-one training and agreements with users for the correct use and maintenance of the RWHS.		
One-on-one training, and other knowledge-sharing activities to develop and strengthen local RWHS installation capacities	Cost includes technical training for each family on the correct use and maintenance of the RWH once the systems are installed and fully operating, including water purification methods, including didactic materials. Women will be a key beneficiary of these training given their key role in household management and child rearing.	$122.685
Monitoring and evaluation of the use and maintenance of community systems	Cost includes yearly follow-up of previously installed systems, refresher trainings, and reparations to any damaged systems.	$81.727
Cost for Component 1		**$4.089.491**
Component 2: Developing and piloting of a community action plan for landscape-scale water management. Overall cost for this component accounts for a full salary for a Landscape-scale water management component director, salaries for the *Wixárika* Regeneration Teams (High skill and low skill), salary for the Field Component Lead, equipment for: topographic survey, sampling and analysis, computing and post-processing, cutting, weight reduction, and personal equipment for teams; all necessary equipment for nurseries installation, cost for monitoring and evaluation activities, SAFS design and implementation, carbon in soil laboratory analysis, physico-chemical laboratory analysis, and a percentage of general project needs such as freights, software and hardware.		
2.1 - Community-driven design of a landscape-scale water management and agroforestry strategy for the *Wixárika* region.		
Community meetings with traditional, communal, and religious authorities, as well as end-users	Cost includes carrying out meetings with local authorities and inhabitants to present the project and define co-participation agreements during the programme.	$30.202

Establishment of the Hydroforestry Committee	Cost includes meetings with the Hydroforestry Committee to define roles and responsibilities, design of the program for the specialised teams that will lead the restoration activities, and writing of results reports.	$30.202
2.2 - 2,000 community members (2 per household receiving RWHS) participating in landscape-scale water management.		
Building capacities for the Specialized Team	Cost includes training to the Intercultural Teams that will carry out socio-educational and technical activities on regeneration techniques, soil identification, safety protocols, topographic survey techniques, and forest fire management.	$211.414
2.3 - 700 forest hectares undergoing regeneration by the community.		
Implementation and development of a landscape rehydration strategy	Cost includes development of technical and participatory strategies, co-design of technical strategies for regeneration and rehydration, as well as co-definition of a participatory action plan.	$181.212
Community interventions and regeneration	Cost includes collective landscape regeneration activities through co-participation of the specialised teams and beneficiaries of the RWHS component, and establishment of demonstration plots based on SAFS.	$151.010
Carbon bond program to achieve team sustainability	Cost includes the design of a carbon bond program to achieve long-term team sustainability, and a training focused on the monitoring, evaluation, and report on carbon retention progress in the soil, to ensure economic stability and replication.	$60.404
2.4 - 3 hectares cultivated under innovative agroforestry practices by 60 families.		
Ongoing training and workshops	Cost includes the delivery of a training on Successional Agroforestry Systems (SAFS), hydrological landscape design, and water storage techniques through participatory methodology workshops, including the design of suitable and adapted strategies for each region.	$211.414

Monitoring and evaluation of activities	Cost includes tracking progress on the rehydration forestry program and SAFS, monitoring the teaching and learning process of the Specialized Teams and beneficiaries of the project, an annual assessment through activity and results reports, and end-of-year meetings with the Hydroforestry Committee to assess achievements and goals.	$181.212
Generation of reports	Cost includes preparation of yearly evaluation reports for each activity, highlighting results, activities conducted, lessons learned, and recommendations.	$120.808
Cost for Component 2		**$1.177.877**
Component 3: Developing communities' capacities for sustainable water management. Overall cost for this component accounts for a full salary for a Capacity Building component director, Capacity Building Manager, Capacity Building Team, cost for development of didactic materials and training delivery, and a percentage of general project needs such as software, insurance and office supplies.		
3.1 - A methodology for community participation and collaboration that ensures community acceptance and ownership of the programme, designed and implemented.		
Design and produce participatory tools and didactic material needed	Cost includes design, adjustment, distribution, and printing of didactic materials (manuals, guides, video tutorials, infographics, educational stories, board games, etc.).	$82.121
Train beneficiaries and general population	Cost includes delivery of training and knowledge exchange activities (workshops, meetings, training and other activities) to households and local committees on the proper use and maintenance of RWHS. Families, students, and teachers will be trained on appropriate hygiene and water purification practices. The population will be trained on the correct implementation, installation, operation, use and maintenance of the techniques and eco-technologies promoted by the project for rainwater harvesting and hydroforestry.	$246.362
Expand and initially train the Wxárika team	Cost includes the design and launch of a call in all localities of San Andrés Cohamiata to expand and reconfigure an intercultural team, with a special emphasis on providing conditions for the inclusion of women. Continuous assessment of the intercultural team's capacity to implement project activities in the localities will be carried out.	$41.060

3.2 - A learning programme to promote RWH adoption, hygiene, environmental regeneration, and climate change resilience implemented with 3,570 beneficiaries. (70% of programme beneficiaries, discounting 30% for infants and elderly beneficiaries who will not participate in maintenance activities)		
Built community agreements	Cost includes carrying out meetings to establish and sign Community Agreements for water management in the territory (including roles and participation for each stakeholder).	$246.362
Create Community art products	Cost includes the facilitation of participatory workshops and research for the creation of artistic products such as murals, songs, videos, photographs, and other community art.	$123.181
3.3 - A certification programme for the local Intercultural Teams of 40 people to develop and strengthen local technical and educational facilitation capacities, delivered; supporting team members to become autonomous agents of change in their communities.		
Design and carry out a robust certification programme for the intercultural team	Cost includes the design and delivery of an on-site certification programme in which the intercultural team will be trained and certified to facilitate community liaison activities, capacity building processes, diagnosis and monitoring, installation of eco-technologies and regeneration of the territory, and the use of toolboxes to carry out each task. These toolboxes will be part of the procedure manuals for the Hydroforestry Committee, RWH Specialized Team, RWH technicians, and socio-educational facilitators that will be designed and developed as a part of this activity)	$82.121
Cost for Component 3		**$821.205**
Component 4: Knowledge management and development of a model for community-led universal water coverage Overall cost for this component accounts for a full salary for a Monitoring and Evaluation component director, Monitoring and Evaluation Team, Community Liaison, cost for data analysis and integration of information, project communications, and a percentage of general project needs such as software and office supplies.		
4.1 Systematised documentation of all technical and community processes taking place during the programme, capturing lessons learned, data and all relevant information to be used for the final design of the model.		
Design the monitoring, evaluation and learning tools for short-, medium- and long-term impact measurement and analysis.	Cost includes the design and production of learning tools and materials.	$72.076

Capture data and evaluate the impact of the installation of RWH technologies and the benefits of the increased access to water in the *Wixárika* communities including effects on hygiene practices, gender dynamics, and more.	Cost includes data analysis and integration of information for RWHS.	$120.127
Capture data and evaluate the direct impact of landscape regeneration in terms of soil rehydration, carbon capture and other climate change mitigation needs.	Cost includes data analysis and integration of information for landscape-scale water management regeneration.	$120.127
Capture data and evaluate the direct impact of the programme's approach to community-led capacity building.	Cost includes data analysis and integration of information for community-led capacity building.	$120.127
Run periodic reflection sessions every 6 months that utilise a variety of sources of information (from activities 2, 3 and 4 above).	Cost includes facilitation of reflection sessions throughout the lifetime of the project.	$72.076
4.2. Detailed manual/toolkit for the effective replication of community-led universal water coverage programmes		
Consolidate, systematise, and structure all the steps and actions taken in the course of implementation, and produce a manual and toolkit detailing the process and lessons learned, facilitating the adaptation and replication of the model for other communities within and outside of Mexico.	Cost includes data and information analysis for the manual content and its production.	$48.051
4.3. A communications strategy to disseminate the impact of our community-led model for universal water coverage within and outside San Andrés Cohamiata.		

Design and deploy an effective communications strategy for the sharing of the manual and toolkit.	Cost includes web page design, a communications specialist, and the creation and deployment of a communications strategy.	$48.051
Cost for Component 4		**$600.634**
Programme Activity Costs		**$6.689.207**
Programme Execution Costs (9,28%)		
Programme staff salaries		$476.057
Accounting		$102.857
HR Specialist		$40.000
Travel*		$65.143
Cost for Programme Execution		**$684.057**
Total Programme Costs		**$7.373.264**
Implementing Entity Fee (8,5%)		
Water Quality Testing		$282,027
Technical accompaniment		$219,355
Programmatic audits		$125,345
Total IE Fee		**$626.727**
Amount of financing requested		**$7.999.991**

*Travel: We have calculated a total of 19 field visits to the Sierra *Wixárika* at a $3.428 cost each, totalling $65,143. Capacity building activities such as training, workshops and meetings for the four components are included on these visits, as well as RWHS installation and regeneration activities.

D. Include a disbursement schedule with time-bound milestones.

Table 14. Disbursement Schedule

	TOTAL	Upon signing (July 2025)	2026	2027	2028
A. Project Funds	**$6.689.207**	$1.399.021	$2.024.616	$2.084.330	$1.181.240
B. Project Execution Costs	**$684.057**	$171.014	$171.014	$171.014	$171.014
C. Implementing Entity Fee	**$626.727**	$86.175	$180.184	$180.184	$180.184
Total	**$7.999.991**	**$1.656.210**	**$2.375.814**	**$2.435.528**	**$1.532.438**

Year 1	Year 2	Year 3	Year 4
1st disbursement – upon agreement signature	2nd disbursement – One Year after project start ▪ Upon First Annual Report ▪ Upon financial report indicating disbursement of at least 70% of funds	3rd disbursement – Two years after project start ▪ Upon Second Annual Report ▪ Upon financial report indicating disbursement of at least 70% of funds	4th disbursement – Third Year after Project Start ▪ Upon Third Annual Report ▪ Upon financial report indicating disbursement of at least 70% of funds
Milestones			
Milestones (by end of year) - Creation of Operation Centres. - Creation of Community Governance Committees and co-participation agreements with local communities - Technical visits to installation sites to	Milestones (by end of year) - Begin Implementation and development of a landscape rehydration strategy. - Ongoing training and workshops: courses about Successional Agroforestry Systems (SAFS),	Milestones (by end of year) - Ongoing RWHS installation - Ongoing training, workshops and installation of RWHS. - Ongoing training and workshops on Successional Agroforestry Systems (SAFS),	Milestones (by end of year) - Final RWHS installation - Final Regeneration activities - Creation of the universal water coverage toolkit - Communications strategy around sharing the toolkit - Final evaluations and reports

determine feasibility and specifications for each system. - Programming of RWHS installations in homes. - Begin implementation of RWHS. One-on-one training, and other knowledge-sharing activities to develop and strengthen local RWHS installation capacities. - Establishment of the Hydroforestry Committee: definition of roles and responsibilities and design of a program for the specialised teams. - Design and production of capacity building materials. - Building capacities for the Specialized Teams. - Website established	hydrological landscape design, and water storage techniques. - Ongoing training, workshops and installation of RWHS. - Ongoing design and production of capacity building materials.	hydrological landscape design, and water storage techniques. - Ongoing design and production of capacity building materials.	

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government

Laura Elisa Aguirre Téllez *Director General* *Secretariat of Finance and Public Credit (Unit of Public Credit)*	Date*: October 22, 2024*

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans in Mexico, in line with the Special Programme on Climate Change, as well as Federal Programmes and Priority Projects, and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
 ***Dr. Adrián Pedrozo Acuña*** *Director General* *Mexican Institute of Water Technology*	
Date: *October 4th, 2024*	+52 777 329 3600 director_general@tlaloc.imta.mx
Project Contact Person: Enrique Lomnitz Climent Director General of Isla Urbana Legal Representative of Lluvia para Todos A.C.	
enrique@islaurbana.org +52 55 4188 5382	

Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

ADAPTATION FUND

Hacienda
Secretaría de Hacienda
y Crédito Público

Letter of Endorsement by Government of Mexico

Ministry of Finance and Public Credit

October 22, 2024

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: +1 202 522 3240/5

Subject: Endorsement for **Ha Ta Tukari, "Water our Life": Towards Universal Drinking Water Coverage for 21 Communities of the Wixarika Nation**

In my capacity as designated authority for the Adaptation Fund in Mexico, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Mexico.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Mexican Institute of Water Technology (IMTA) and executed by Lluvia para Todos A.C.

Likewise, I would like to inform you that if the Board approves the project, I will be working closely with IMTA as the National Designated Authority during the project design and implementation process.

Sincerely,

Laura Aguirre Téllez

Laura Elisa Aguirre Téllez
General Director of International Fora and Sustainable Financing
Ministry of Finance and Public Credit
Unit of Public Credit and International Affairs
+52 55 3688 1873
laura_aguirre@hacienda.gob.mx

List of Annexes

1. Executing Entity Declaration Letter
2. Rainwater Harvesting Systems Tech Sheets
    a. RWHS with Geomembrane cistern
    b. RWHS with Concrete cistern
3. Pilot selection criteria for new storage tank
4. Experience in the proposed field
    a. Isla Urbana - Rainwater Harvesting
    b. La Ventana Infinita - Capacity Building
    c. SARAR - Landscape Regeneration
5. Gender assessment of the Wixárika Communities Belonging to San Andrés Cohamiata
6. Analysis of San Andrés Cohamiata’s Climate, Vegetation, and Erosion
7. Population Ranges and RWHS efficiency
8. Examples of the Consultative Process
9. Didactic Material
10. Ha Ta Tukari’s Implementation Route
11. Community Diagnostics in San Andrés Cohamiata
12. Bibliography

ANNEX 1
Executing Entity declaration letter

The executing entity for the Ha Ta Tukari project will be Lluvia para Todos A.C., a non-profit based in Mexico City that operates within the Isla Urbana project.

Isla Urbana is the brand name for a hybrid organization that includes a social business (Solución Pluvial SA de CV) and a non-profit NGO (Lluvia Para Todos AC), as well as a 501C3 based in the United States, Isla Urbana USA. The Social Business focuses on the development of rainwater harvesting products and services, and carries out rainwater harvesting projects funded by sales, often to local governments, while the Non-Profit NGO carries out community projects, generally in contexts of high marginality, funded by grants and donations. The c503's goal is to raise funds for specific projects (mostly in rural and indigenous communities) and organize exchange student programs and internships between the USA and Mexico, mainly.

"Isla Urbana" has no legal personality of its own. The organization, when originally founded, called itself Isla Urbana, but the name was already registered in Mexico, and thus when the NGO and the Social Business were legally constituted, it was under the names Lluvia Para Todos AC and Solución Pluvial SA de CV respectively. The name Isla Urbana continued to be used however, and it is the name by which the organization is commonly known.

There is no legal relationship between the business and non-profit, but there is collaboration, largely in the form of donated labor, office space and infrastructure from the business to the non-profit.

Enrique Lomnitz
General Director of Isla Urbana
Legal Representative of Lluvia para Todos AC

ANNEX 2

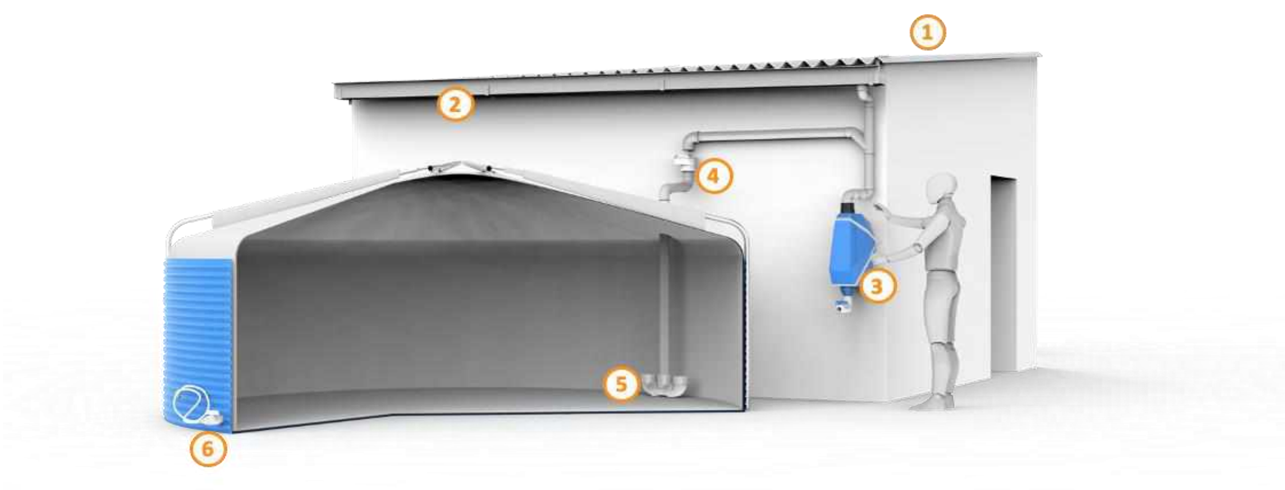
Rainwater Harvesting Systems Tech Sheets

IslaUrbana

RAINWATER HARVESTING SYSTEM WITH GEOMEMBRANE CISTERN

The "Atlali", Isla Urbana's Geomembrane cistern, is made from 1 mm HDPE membrane, a frame of galvanized conduit tubes, surrounded by a wall of metal sheet for protection and high durability. Given that the assembly is done on-site by specialized technicians, this model allows the transportation of significant volumes of storage in a small space (4 complete cisterns in 1 pick-up trick).

It measures 4 m in diameter and has a storage capacity of 14,000 L .



1. **Existing Rooftop**
   Catchment area, usually made of slab, metal or plastic sheet.

2. **Rain Gutter**
   Gutter that centralizes the water and directs it to the piping and the rest of the system.

3. **Tlaloquito 40**
   First-flush container that separates the initial 0.5-1 L of rain, allowing the rain to clean the roof and keep the most contaminated volume of each rainfall episode out of the storage tank, increasing water quality in up to 75%.

4. **Leaf Screen**
   Stainless stell mesh that prevents leafs, branches, and other solids to enter the storage.

5. **Calm Inlet**
   Turbulence reduction device that allows the water to enter the tank from the bottom without mixing sediments.

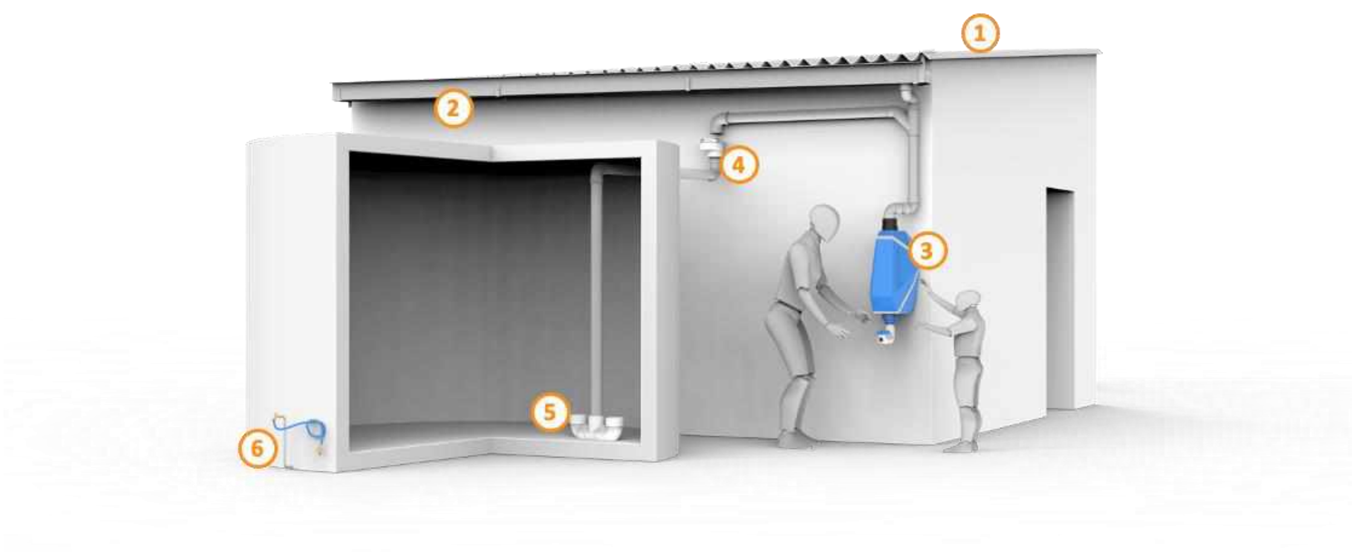
6. **Valve & Hose**
   Valve at usage point to fill buckets or connect an 8 m hose to get the water elsewhere.

IslaUrbana

RAINWATER HARVESTING SYSTEM WITH CAST-CONCRETE CISTERN

The monolytic cast-concrete cistern with 4” thick walls is made in a specially designed mould, with a specific mix of concrete, accelerants and additives and precise implementation method to be ready to use in just a couple of days. It is built on-site by a specialized team; the materials, tools, and mould (around 1 ton) are taken to each implementation site by a trailer and truck.

It measures 2.8 in diameter and 2 m in height and has a storage capacity of 12,000 L.



1 **Existing Rooftop**
Catchment area, usually made of slab, metal or plastic sheet.

2 **Rain Gutter**
Gutter that centralizes the water and directs it to the piping and the rest of the system.

3 **Tlaloquito 40**
First-flush container that separates the initial 0.5-1 mm of rain, allowing the rain to clean the roof and keep the most contaminated volume of each rainfall episode out of the storage tank, increasing water quality in up to 75%.

4 **Leaf Screen**
Stainless stell mesh that prevents leafs, branches, and other solids to enter the storage.

5 **Calm Inlet**
Turbulence reduction device that allows the water to enter the tank from the bottom without mixing sediments.

6 **Valve & Hose**
Valve at usage point to fill buckets or connect an 8 m hose to get the water elsewhere.

ANNEX 3

Pilot selection criteria for new storage tank

Of all the RWH system's components, the most important, costly, and complex is the storage tank. There are several kinds of tank, each with pros and cons. The question as to how to evaluate and determine the better option depends on the degree to which the cons can be mitigated, and the pros can be fully realized in the context of the Wixárika mountains.

In the case of the Wixárika Sierra, we have so far opted for lightweight, polyethylene geomembrane tanks supported by a steel mesh or sheet structure. This decision is principally based on the high transportability of geomembrane tanks, which are very lightweight, can be folded into bundles, and carried practically anywhere. Given the geography, road conditions, and distances involved in the Sierra, these are not small virtues.

Geomembrane tanks have proven very functional and successful for creating water storage in these remote places. Still, they have their shortcomings, and for years we have considered the option of implementing concrete tanks, but found the difficulties involved to be prohibitive. The relative pros and cons between geomembrane and concrete tanks are summarized in the following table:

Pros for

	Pros	Cons
Geomembrane	**Lightweight and easy to transport to remote villages** (aprox 120 kilos total, divided into s pieces) **- Fast and easy to install** (2-3 hours per tank, 4-6 people) **- large capacity** (we generally use 15k liter tanks +/-)	**Relatively easy to damage** (membrane can be ripped, poked, blown in the wind) **-Hard to repair** (requires specialized tools, know-how, electricity at worst - creating a supply chain for special patches at best) **-Introduces plastic into the landscape** (Over a longer time horizon, geomembrane tanks eventually become large pieces of plastic waste)
Ferrocement or Concrete	**Permanent and robust** (if well-made, can be considered permanent. Lifespan in multiple decades at least) **- Preferred option for most people** (if given the choice, most people want a concrete tank over a plastic one)	**Takes a long time to build** (Typically, 5-10 days for a tank, start to finish) - **Difficult quality control results in leaks** (if concrete mixing and application isn't consistent, timely, and correct, can lead to frequent fissures and leaks) **- Labor intensive** (5+ days of hard physical work for a team of 4-6) **- Requires transport of heavy materials** (multiple tons of cement, aggregates, water, and mesh for every tank)

concrete are substantial and relate to the physical end result: **Solid tanks that will last a lifetime.**

Pros for **geomembrane** relate to the process of implementation: They are lightweight and fast to install.

The Final Decision

- If all else were equal, the choice of what type of tank to implement in the Sierra would be simple: concrete in all cases. But building concrete tanks involves getting over 8 tons of construction materials to every home, a challenge anywhere, and much more so in the Wixárika Sierra, with its thinly spread population and poor road conditions.
- We have worked intensely to find solutions to the logistical problems related to getting materials for concrete tanks into the sierra, and our conclusion is that at present, conditions allow for concrete tanks to be installed in the Wixárika Sierra, but only in places that can be reached by road with at least a 8 ton truckload of materials.
- Implementing with only geomembrane tanks would be the easiest solution, but given the merits of both types, we believe it is worth implementing concrete ones where these are viable.
- **Therefore, the proposed strategy is:** In those towns and villages that are on or near enough a road that concrete, gravel, and sand can be realistically delivered to each home, concrete tanks will be used. In those villages and hamlets that can only be reached by trails or roads too steep or rugged for heavy loads, it will be geomembrane tanks.
- Mitigating geomembrane's primary problem -its vulnerability to being punctured or torn- will be achieved by using steel sheet walls instead of mesh. This represents a significant degree of security, allowing them to function for decades.
- We anticipate that the two types of tanks will be installed in about equal numbers, though the exact proportion of each will ultimately depend on the road conditions and the willingness of materials providers to push deeper into the mountains.
- Because concrete tanks are more expensive, we propose budgeting for a 50-50 ratio of concrete to membrane, and if in the process of implementation we find it necessary, we can increase the number of total systems by installing less in concrete and more in geomembrane.
- Using two different types of RWH system will add complexity to the implementation process, but also has some benefits: one, the work can progress even if one of the two supply chains hits any snags; and second, by implementing both, the implementation model that is being developed will be replicable in a wider range of contexts with closer-to-ideal solutions.

We conducted a study in order to quantify (1) the number of RWHS needed, (2) the characteristics of dwellings, and (3) the benefits of these systems on the population of SAC (link). Firstly, we obtained two different estimates for the number of dwellings within SAC. The first one uses the official localities from the 2020 INEGI census with an extrapolation for the missing values, which resulted in a total of 1,778 dwellings. However, the second estimate obtained through a diagnostic yielded a total of 2,590 dwellings, a difference of ~46%.

The average dwelling in SAC has a rooftop area of 34 m^2 and 5.1 occupants, and through a RWH calculator, we estimated the RainWater Harvesting Potential 'RWHP' assuming a 20 L/day/person consumption and harvesting yearound. Firstly, using the water storage tank of 15,000 L, the average dwelling would have an annual RWHP of 64%, completely relying on rain from July to January, and having a partial RWHP the rest of the year. On the other hand, using the 12,000 L tank with the additional $6m^2$ harvesting area, the average dwelling has a RWHP of 76%, completely relying on rain from July to February. However, both cases would need additional water storage and rooftop area in order to obtain a RWHP of 100%, and would need to partially complement their water consumption from other sources from January/February until June.

Through a statistical analysis, we obtained that about ~31% of dwellings have 5 occupants per household ‘AOH’, ~25% have 4, ~18% have 6 and ~12% have 3. Similarly, ~29% of dwellings have a harvest area of 30m2 to 40m2, ~28% have up to 20m2, and ~21% have 40m2 to 50m2. Finally, we iterated a combination of parameters in the RWH calculator, and obtained that to ensure a RWHP of 100%, each person would, at a minimum, have a rooftop area of 10 m2, and a water storage capacity of 4,000L.

ANNEX 4

Experience in the proposed field

a) Isla Urbana - Rainwater Harvesting

Isla Urbana (the umbrella organization made up by Lluvia Para Todos and its sister company Solución Pluvial; see Annex 1) was founded in 2009, and is since a pioneer organization in the field of Rainwater Harvesting used at scale as a tool for achieving water resilience in vulnerable communities. Our focus is on low-income peri-urban and urban settlements, as well as isolated indigenous communities. We have installed over 40,000 RWH systems in homes and over 1,000 in schools throughout the country.

Our work has focused on the development of technologies and implementation models that allow the large-scale deployment of Rainwater Harvesting Systems that achieve long-term adoption and appropriation by their users. The models we have developed involve carefully designed technology in the form of robust and durable physical components, combined with user training, local technical capacity building, production of didactic materials, and long term support, in order to leave communities with a deep appropriation of rainwater harvesting practices. Follow-up and long term monitoring have shown robust adoption of the systems many years after project implementations.

Our experience implementing and designing rainwater harvesting programs has included significant contributions to the development of rainwater harvesting policy in the country. Mexico City's Rainwater Harvesting Program was largely designed with Isla Urbana, as was Guadalajara's Nidos de Lluvia Program, along with several municipal scale programs. In 2022, 2023, and 2024, Isla Urbana installed over 17,000 rainwater harvesters within the context of these large-scale programs, and in the same period, extended its network of "Rain Schools" -schools that implement RWH systems together with workshops and support for the school community to learn how to use and maintain them long term- by over 500 schools.

Isla Urbana has also executed RWH projects in remote and isolated indigenous communities for many years, including in the *Wixárika* (where the current proposal is focused), the *Rarámuri* (Tarahumara), and *Mazateca* sierras. In these rural, isolated, highly marginalized contexts, the levels of water precariousness are extremely high. This has generated very strong receptivity and high adoption of RWH systems by the local families and community members, for whom having a large tank full of clean water in their homes has proven of huge benefit. Through careful administration, they have generally been able to use these tanks to secure drinking water year round, saving each family hundreds of hours of heavy work hauling water every year.

The work in these communities, however, has far greater levels of complexity than what we find in cities like Mexico and Guadalajara. The geographic isolation, lack of roads, and poor state of infrastructure alone have required the development of specific RWH system designs better suited for transportation by hand and pack animals (for which reason we have developed the geomembrane cistern designs included in this project). More significantly, the vast cultural and linguistic differences between the different indigenous communities found in the country, and between them and the broader mestizo culture, makes the social, organizational, and capacity building aspects of the work especially complex. Nowhere is this truer than with the highly isolated and very unique *Wixárika*, with whom we have worked for the past 14 years.

Executing projects in these communities has involved the development of community work models grounded in concepts of empathy and culturally sensible knowledge sharing. The *Wixárika* have been traditionally distrustful of "*teiwaris*" -non-indigenous outsiders-, and the main town of San Andrés Cohamiata where this project takes place is over 16-hour drive from Mexico City, passing dangerous and largely lawless tracts of mountain highway. Because of its nature, this project requires a far deeper understanding of the local culture and context, its cosmovision and traditions, and a much more sensitive approach to be able to intervene in the field. These are some of the reasons why the work in the *Wixárika* Sierra has been so slow and cautious in comparison to Isla Urbana's larger urban programs. Further details about lessons about other projects and lessons learned are discussed in Annex 4.

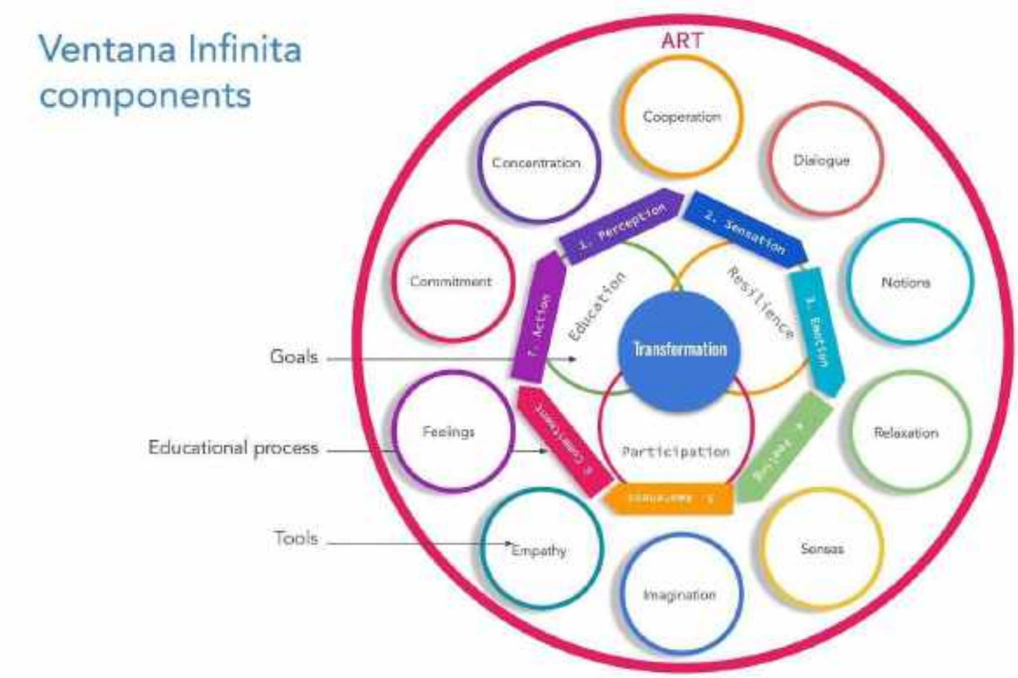
b) La Ventana Infinita - Capacity Building

We are well aware of the challenge that scaling up complex processes of linkage and capacity development on a regional scale represents. However, we are profoundly experienced in this field, even beyond Ha Ta Tukari. The need for the systematization of the capacity development and linkage work carried out by Ha Ta Tukari over 14 years has contributed to the consolidation of *La Ventana Infinita*, a non-formal education method based on art, aimed at socially disadvantaged populations.

La Ventana Infina is a method of working through art, of an integrative, sensitive and playful nature, designed to develop processes of non-formal education, resilience and community participation with socially disadvantaged populations. Its objective is the achievement of a comprehensive training process that leads the participant to recognize themselves in relation to their socio-environmental context, as well as to develop capacities to transform and dignify their life situation. *La Ventana Infinita* turns to artistic creation as a generator of agency because "*Art is a process of transformation that leads the creator, as an individual and as a community, to become aware of their ability to transform themselves and the world around them"* (Lobo, 2010, unpublished). It is a flexible method that interacts and is easily integrated with all types of participatory methodologies and work, which has been the fundamental basis for the capacity development component of Ha Ta Tukari throughout the years.

The method provides educational content that contributes to the understanding of the socio-environmental problems in which the community is immersed and their effects on its life, its environment and its culture. This process promotes the vulnerable population to find the causes and consequences of their problems and to be able to recognize, prioritize and express their needs. Through this, the need for water access has emerged, as has the recognition that adaptation to climate change is a process that requires a planetary, holistic and transdisciplinary approach. The community will thus create its own narrative, delimiting and prioritizing the issues to be addressed.

The method is aimed at ensuring that participants: a) propose concrete actions, achievable in their daily lives, that contribute to the solution of their needs; b) develop emotional resilience to overcome problems whose solution is not in their hands, and c) find spaces for expression and participation in their community. An educational process is developed (See Figure 1), in which the construction of educational content is accompanied by a sensitive process that helps the participant recognize and express their needs, particularly those of a radical nature, in addition to actively promoting empathy. This educational-sensitive process leads the participant to become aware and acquire commitments for transformative action, on a personal and collective level.



c) SARAR - Landscape Regeneration

SARAR Capacitación AC has been developing water access and sanitation projects for over 30 years, employing a highly participatory approach based on popular environmental education methodologies and non-formal adult education models. These approaches have inspired and served as a foundation for the development of many other programs, such as the Methodology for Participatory Assessments (MPA), WSP/World Bank, the Participatory Approach to Safe Shelter Awareness (PASSA), International Federation of the Red Cross (IFRC), as well as the Healthy Environments, Ministry of Health, Colombia.

In recent years, following changes in the organization's leadership with Rafael Almazán taking over operational direction, there has been a shift in focus within the organization. It has been recognized that integrated water management must extend beyond simply distributing water through pipes to homes. Effective forest management and water harvesting at infiltration and recharge points are now considered essential for a comprehensive approach to water management. In this context, the organization has collaborated on, co-directed, and co-implemented various awareness-raising, training, and project implementation strategies for forest restoration, including:

- Restoration of micro-watersheds in the Tepoztlán Valley: Water harvesting and soil restoration project in the Chihuacématl - Coatlaco ravine (50 hectares) – Fundación Grimm, 2020-2021

- External consultancy for the Indigenous Municipality of Hueyapan, Morelos: Advocacy and integrated water management. Development of strategies and action plans for the restoration of forest ecosystems (80 hectares).

Through these projects, and other important collaborations, SARAR has acquired valuable experience not only to lead the implementation of the regeneration activities, but most importantly, to do so from a perspective of community based projects, maintaining the fundamental idea that the project must be co-designed with the community and implemented by its members.

ANNEX 5

GENDER ASSESSMENT OF THE WIXÁRIKA COMMUNITIES BELONGING TO SAN ANDRÉS COHAMIATA

Gender in the Wixárika communities

The Wixárika are a very gendered society, in the sense that roles and expectations for women and men are distinct. In most areas of life, from the domestic and mundane, to the political, religious, and spiritual, women and men each have specific roles, tasks, and responsibilities. Childrearing, Nixtamalization, tortilla making, water hauling, sewing/weaving/embroidering, all fall principally to women, while gathering firewood, housebuilding, and hunting, are generally done by men. Growing corn and other crops is done by both men and women. The spiritual life of the Wixárika, which involves performing multiple pilgrimages, ceremonies, fiestas, and sacrifices, and entails extraordinary amounts of work and time, involves both men and women, both of whom fulfill essential functions and take on “cargos” or mandates that generally involve 5-year commitments to a specific ceremonial center or group of pilgrims. Men, however, make up the vast majority of *Mara’akames*, the spiritual leaders or shamans who are at the top of the Wixárika social order.

The spiritual practices of the Wixárika seem to reinforce a hierarchized gender dynamic, with women generally performing supporting rather than directing roles, but it would be simplistic to write off their importance within “*El Costumbre*” as the system of spiritual beliefs and practices is called. In the political realm, men occupy most positions of power within their largely autonomous local government. Sheriffs, traditional governors, municipal agents, etc, were until recently almost exclusively men, though in more recent times, women have taken on some important positions as well. Traditional gender roles largely, though not entirely, relegate women to the domestic sphere, but women do occupy essential roles and obligations in the ritual and ceremonial sphere, and sometimes take on important leadership positions as well. As with all things, there is complexity and nuance.

Change is clearly happening in the Wixárika Nation insofar as gender roles are concerned, and the subject of women’s rights and inclusion are being brought up by the Wixárika themselves. We hear the issue increasingly come up in our conversations with Wixárika people of both sexes, and in the latest general assemblies, where all the villages converge on San Andrés to discuss and make decisions, women’s rights have been one of the subjects included in the program.

The changes towards greater gender equity occurring in the Wixárika are real, but do not negate the reality that women are still generally subjected to rigid expectations in the roles and types of work they perform and are often subjugated by male partners or family members who give or deny them permission to do many things, to meet with specific people, travel, or work. Many Wixárika women and several men we have spoken with directly about these issues describe their society as being very “*machista*”. Young Wixárika of both sexes with whom we have spoken and conducted separate men and women’s circles, have proven quite open in recognizing this issue and expressing frustrations with it.

Gender dynamics and *machismo* in the Sierra manifests in multiple ways. Many women from more conservative families will not speak to or even look at strangers, for fear of being reprimanded, or simply from a painful level of timidity borne from isolation and exclusion from life outside the home. Women becoming pregnant and then being left to raise the child alone is a fairly common phenomenon which leaves them in conditions of great economic precariousness.

In the worst cases, women are the subjects of serious intrafamily violence and submission which can occur with little interference from the wider community, which tends to not involve itself in such private affairs. In the most extreme cases, this sometimes goes so far as to result in feminicides, with women killed by irate or jealous partners, who often face little or no punishment.

These dynamics are all in a moment of flux and change, tending towards greater empowerment, freedom, and agency for women. This also generates pushback from many men, and at present we are observing clear tensions within families, partners, and especially young people, as they maneuver the shifting ideas about their roles and expectations with each other.

If a simple assessment of the gender conditions in the Sierra were to be summarized, it could be said that the Wixárika are a highly traditional native American society with set gender roles that generally confer greater power to men than to women, and often relegate the latter to the domestic sphere. Gender violence is a very real problem, and many women suffer all manner of abuses at the hands of their male partners or relatives, usually with little community support or recourse. At the same time, a great deal of nuance and variation exist and there are several examples of Wixárika women who have real social, spiritual, and political power within the community. Younger generations are increasingly vocal in questioning the traditional gender roles and dynamics, and many young women are clearly more empowered than their mothers. The subject of gender equity is in many ways decades behind the rest of the country, but things are changing with considerable speed. We believe the issues of gender equity requires thoughtful, sustained, and context-sensitive work and support as the new generation of Wixárika people question the expectations and rigidity of traditional roles and work to allow women greater freedoms and position.

ANNEX 6

ANALYSIS OF SAN ANDRÉS COHAMIATA'S CLIMATE, VEGETATION, AND EROSION

Climatology (Geiger-Koppen)

The north-central zone of San Andrés Cohamiata, mainly in the highlands, has a temperate subhumid climate C(w2), with average annual temperatures between 12°C and 18°C. The temperature of the coldest month ranges between -3°C and 18°C, and the temperature of the hottest month is below 22°C. Precipitation in the driest month is less than 40 mm, with summer rains and a winter rainfall percentage of 5% to 10.2% of the annual total. The central southwest zone, as well as the northwest and northeast borders of San Andrés Cohamiata in the lowlands, have a warm subhumid climate (A)C(w1), with an average annual temperature above 18°C, a temperature of the coldest month below 18°C, and a temperature of the hottest month above 22°C. Precipitation in the driest month is less than 40 mm, with summer rains and a winter rainfall percentage of 5% to 10.2% annually. The southeast border of San Andrés Cohamiata has a warm subhumid climate, with an average annual temperature above 22°C and the temperature of the coldest month above 18°C. Precipitation in the driest month is less than 60 mm, with summer rains and a winter rainfall percentage of 5% to 10.2% of the annual total.

Climate Change

Based on a global study of climate change from 1989-2016 (current) to 2071-2100 (future) using the Köppen-Geiger classification (Beck et al., 2018) within San Andrés Cohamiata for the current period, the north-central and southwest zones have a temperate sub humid mountain climate (Cwb). The subtropical monsoon climate (Cwa) covers almost all the rest of San Andrés Cohamiata, with the southeastern border being primarily tropical savanna (AW). In the future, the temperate sub humid mountain climate (Cwb) completely disappears and is replaced by the subtropical monsoon climate (Cwa). In turn, the subtropical monsoon climate (Cwa) is replaced by tropical savanna (AW), and the areas that were previously tropical savanna (AW) are replaced by a warm semi-arid climate, which also appears on the northwest and northeast borders of San Andrés Cohamiata.

Aridity Index

Most of San Andrés Cohamiata falls within a dry sub humid aridity index, corresponding to an aridity index of 0.5 - 0.65, while the northeastern border of the core area belongs to the semi-arid zone with an aridity index of 0.20 - 0.50 (Colantoni et al., 2015). The latter has a real evapotranspiration that is proportionally greater than precipitation (Fick & Hijmans, 2017; Trabucco & Zomer, 2018).

Precipitation

Using average annual precipitation data from the period of 1970 to 2000 (Fick et al., 2017), at a resolution of 1 km, it is revealed that San Andrés Cohamiata has a precipitation range from 709 mm/year to 987 mm/year. The differences in precipitation present a gradient mainly from the northeast with lower precipitation to the southwest with higher precipitation, which also correlates with altitude, as higher altitudes receive more precipitation and vice versa. The areas with the lowest precipitation are found on the eastern border, mainly from the east-central area to the northwest, specifically in the northern valleys of San José El Tesorero and the valley separating the localities of Las Guayabas and El Chalate. The north-central part of San Andrés Cohamiata, specifically the highland area between La Cebolleta and El Carrizal, receives precipitation around 830-840 mm/year. The southwestern part, near Las Tapias, Palma Chica, and Tutuyecuamama, is the area with the highest precipitation, around 920-950 mm/year. This is possibly due to a greater influence of moisture coming from the Pacific.

Analysis of Cumulative Deviations (Dry and Wet Periods)

The analysis of cumulative deviations involves comparing the difference in precipitation of a specific year (each year from 1981 to 2022 in this case), with the average annual precipitation of a data series and accumulating the differences. If over a series of years the precipitation has been less than the average, a more negative number accumulates through time and vice versa for years with more rainfall than the average. Thus, in the graph, a positive or increasing slope indicates a series of wetter-than-average years, while a negative or decreasing slope indicates a series of drier-than-average years.

In Figure 1, it can be seen that from the period 1981 to 2001 there has been a streak of dry years, while from 2001 to 2021 there has been a streak of wet years, with some years that do not correspond to the general trend of the series.

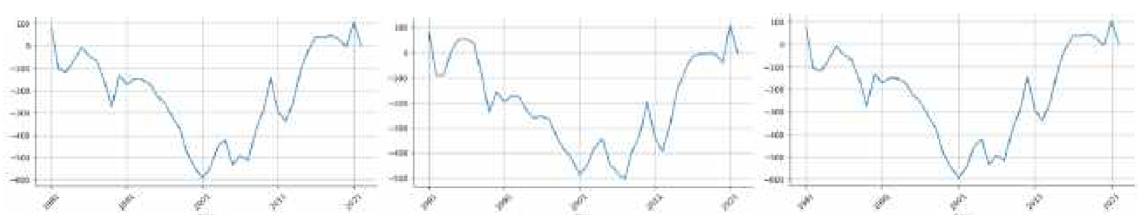


Figure 1: Cumulative deviations (a) la Cebolleta, (b) San Andrés Cohamiata andy (c) Tutuyekwamama.

Potential Evapotranspiration

The ranges of potential evapotranspiration, or the total capacity of the atmosphere to evaporate water (not necessarily the actual amount that evaporates, see real evapotranspiration), within San Andrés Cohamiata are around 1,826 mm/year to 1,992 mm/year. There is a spatial distribution where higher altitude areas have lower evapotranspiration values compared to those at lower altitudes (Trabucco et al., 2018). The lowest values are recorded in the north-central part and the southwest border. The highest values are recorded on the southeastern border of San Andrés Cohamiata.

Erosion

Within the Soil Erosion Dataset (INEGI, 2014), it has been found that erosion within San Andrés Cohamiata is relatively low. About 44% of the area shows no apparent erosion, and 52% has slight erosion. Only 4.5% of the territory has moderate erosion. The predominant type of erosion is sheet erosion, and only 1.9% has slight gully erosion as a secondary component. It should be noted that the resolution of the data is low (1:250,000), so localized cases of severe erosion within San Andrés Cohamiata are possible.

Type of erosion	Percentage of area within San Andrés Cohamiata
without apparent erosion	43.5%
Slight laminar erosion	51.8%
Moderate laminar erosion	2.73%
Moderate laminar erosion & slight gullies	1.89%

Types of erosion and the percentage of area covered by each. Data obtained in INEGI (2014).

Land Use and Vegetation

According to the European Space Agency's land use classification (ESA, 2021), 52.6% of San Andrés Cohamiata has tree cover, followed by 34.6% shrubs and 12.1% grasslands. Only 0.3% of the area is used for crops, 0.2% for sparse vegetation, 0.1% for urban areas, and 0.05% for permanent water bodies.

Around 55.9% of the territory consists of secondary vegetation, or vegetation that has grown in areas previously altered by human and/or natural factors. Pine-oak and/or oak-pine vegetation (including tree, shrub, and secondary vegetation) covers 26.2% of the area. Oak vegetation (including tree, shrub, and secondary vegetation) accounts for 22.3%, while low deciduous rainforest covers 19.0%. Pine vegetation (including tree, shrub, and secondary vegetation) makes up 4.7%.

ANNEX 7

POPULATION RANGES AND RWHS EFFICIENCY

Terminology

We are considering the following indicators:

- Rainwater Harvesting Potential (RWHP) or the percentage of annual water demand fulfilled only by rainwater
- Rainwater Loss by Limited Storage (RWLS) of the percentage of annual water demand lost by limited water storage capacity

Ideally, dwellings need to achieve a RWHR of 90% or greater (100% is the conceptual goal) while having a low RWLS of below 15%. In a scenario where a dwelling has a RWHP of 100% or very close to this, a RWLS below 15% is the best, meaning that there is water that could be used if demand increases or a drier-than-average year appears. However, a bigger number of say 30-40%, means the system is not efficient, and resources could have been allocated to harvesting water that will go to waste.

On the other hand, dwellings with a RWHP lower than 90%, are either constrained by rooftop area or water storage capacity, of course, ignoring low precipitation rates, high water consumption and a crowded dwelling, which are also a constraint. If a dwelling with low or medium RWHP while having a RWLS of zero, indicates that there is not enough rooftop area. On the other hand if a dwelling with low or medium RWHP has a RWLS of over 15-20%, it indicates that storage capacity is not enough for all the water being harvested.

In this study, we used a rainwater harvesting calculator developed at Isla Urbana that simulates each step from precipitation, harvesting, losses, storage and consumption on a daily resolution scale. This calculator obtains the daily precipitation data from CHIRPS with a given coordinate. The coordinates for the locality with the rainfall closer to the average between all the 21 localities in San Andrés Cohamiata, which is Tierra Blanca (22.3008889, -104.3345555). The average annual rainfall is 829 mm with a variability of ± 20.8% taking the total annual precipitation from 1981 to 2023. This locality has a rainy season from June to October, with July being the wettest month (figure 1).

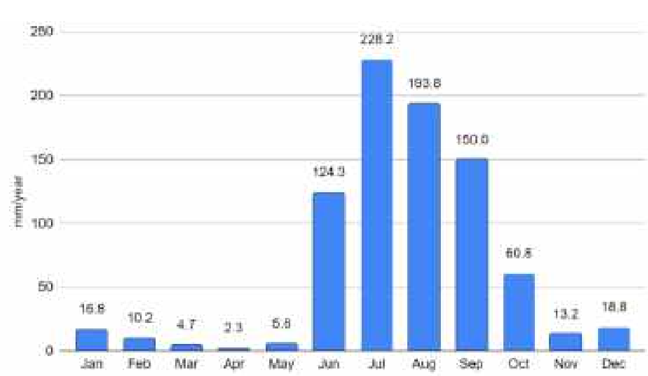


Figure 1: Average monthly rainfall in mm from Tierra Blanca (1981-2023).

Assumptions

As we want to estimate the total amount of water, the calculations do not take into account a first flush diverter or first rain separator, but in reality every RWHS will include one with a volume of 0.67 times the rooftop area of every dwelling. These simulations assume that both the water storage tank and the first flush diverter will be used by every dwelling. Also, a loss factor of 10% is used in all simulations and a daily water consumption of 20L, as this is the goal. However, in reality these two variables, along with the uncertainties and variability of future precipitation levels in the coming years might skew the results of the following simulations and should be taken as an estimation using the best up-to-date method.

Estimating ranges for rooftop area and average occupants per household

Firstly, the 114 official localities within SAC registered in the INEGI Census of 2020 (INEGI, 2020), were obtained, Then, for each locality we divided the total number of inhabitants with the number of private inhabited dwellings to get the total range of Average Occupants per Household or 'AOH'. Then, we mapped 124 footprints of buildings using publicly available Google Satellite imagery to get a range of average rooftop areas. This gave us the possibility of estimating the probability of occurrence for a given value within the Agrarian Nucleus, as seen in Figure 2 as well as mean values for both. Firstly, we can see that about ~31% of dwellings have an AOH of 5 people, followed by 4 people with ~25%, 6 with ~18%, 3 with ~12% and 7 with ~10%. Overall, more than 50% of the dwellings have an AOH of 4 and 5, and more than 95% have a range of 2 to 7 people. On the other hand, dwellings with 30m^2 to 40m^2 are the most common, with ~29%, dwellings with up to 20m^2 with ~28% and dwellings with 40m^2 to 50m^2 with ~21%. Dwellings with up to 50m^2 make up more than 75% of the population.

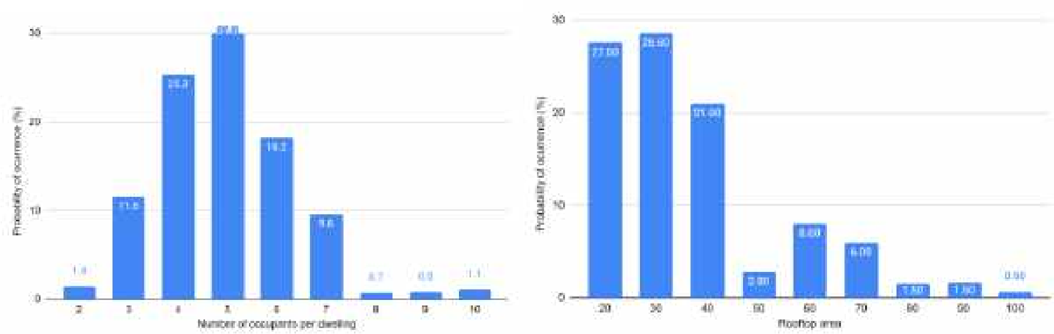


Figure 2: Probability of occurrence for both number of occupants per dwelling and rooftop area.

These two variables give us a pretty good estimation of what we can find in the Agrarian Nucleus. However, as these two variables are decoupled from each other, we can not have a reliable estimate combining these estimates (the percentage of dwellings with 2 people and 30m^3 of rooftop for example). Thus, it is convenient to analyze possible combinations of these variables.

Objective 1: What is the rainwater harvesting potential of the average dwelling within San Andrés Cohamiata Agrarian Nucleus?

For the average household in SAC, the main constraint for RWH is rooftop area. As seen in table 1, the 4 combinations possible, only with the additional 6m2 of harvesting area included in the 12,000 L water storage tank a PAWDL of 3% is reached. In this case though, a RWHP of 76%, or more than ¾ of the annual water demand can be supplied only with rainwater if RWH is carried out year-round. Having the 6m^2 additional harvesting area, increases the RWHP by 12% harvesting year-round and 7% harvesting only from June to October.

System type	RHW season	Water storage tank (liters)	Average occupants per household	Total rooftop area (m^2)	Percentage of annual water demand fulfilled by rainwater	Percentage of annual water demand lost by limited water storage capacity
Average	all year	12,000	5.1	40	76%	3%
Average	all year	14,000	5.1	34	64%	0%
Average	Jun-Oct	12,000	5.1	40	67%	3%
Average	Jun-Oct	14,000	5.1	34	60%	0%

Table 1: RWHP and PAWDL for each of the 4 simulations taking into account the average dwelling characteristics in SAC.

However, this shows that the average dwelling in SAC is not able to fully depend on rainwater yearound with the proposed system and would need to obtain water from other sources during the dry season. Having said this, all four of these combinations considered, rainwater can fulfill all water demands from July to December, or half of the year during the wet season (table 2). However, with the RWH yearound and the 12,000 L tank with the additional 6m2 of rooftop, the average dwelling can fulfill all water demands with rainwater up until February, and would have partial RWH from March to June.

	Percentage of annual water demand fulfilled by rainwater per month			
	RWH all year round		**RWH season from June to October**	
Month	**With a 12,000 L tank and additional 6m2 of rooftop**	**With a 14,000 L tank**	**With a 12,000 L tank and additional 6m2 of rooftop**	**With a 14,000 L tank**
January	100	100	100	55.5
February	100	14.8	48.2	0
March	25.6	4.5	0	0
April	2.7	2.3	0	0
May	6.6	5.6	0	0
June	85.9	82.8	85.9	82.8
July	100	100	100	100
August	100	100	100	100
September	100	100	100	100
October	100	100	100	100
November	100	100	100	100
December	100	100	100	100

Table 2: RWHP per month for each of the 4 simulations taking into account the average dwelling characteristics in SAC.

Objective 2: What are the characteristics needed to guarantee a daily water consumption of 20 liters per person in dwellings?

Then, multiple simulations of rooftop area in increments of 5 meters were carried out with different combinations of water storage tanks (12,000 and 14,000) in order to obtain the minimum rooftop area and water storage capacity to have a RHWP of 100% based on number of inhabitants per dwelling (2 to 10 inhabitants). In table 3, the best combinations of water storage tanks with the minimum rooftop area are given for 2 to 10 inhabitants per dwelling. It is interesting to note that only dwellings with 3 or less people can obtain a RHWP of 100% with only one water storage tank and a combination of two storage tanks for dwellings of 4 to 7 people

Roughly, we estimate that at least 10 m2 of rooftop and 4,000L water storage tank are needed per person annually to obtain a RWHP of 100%

Number of inhabitants	rooftop area (m2)	water storage volume (L)
2	20	12,000
3	30	12,000
4	40	12,000 + 12,000*
5	50	12,000 + 12,000
6	60	12,000 + 12,000
7	70	14,000 + 12,000
8	80	14,000 + 14,000 + 12,000**
9	90	14,000 + 12,000 + 12,000***
10	100	14,000 + 14,000 + 12,000****

*** a RWHP of 98% is obtained with a 14,000 L tank**
**** a RWHP of 98% is obtained with two 14,000 L tanks**
***** a RWHP of 93% is obtained with two 14,000 L tanks**
****** a RWHP of 84% is obtained with a 14,000 L & a 12,000 L tanks**

Table 3: Requirements to achieve a RWHP of 100% based on the number of inhabitants per dwelling.

Objective 3: What is the volume of water and average RWHP expected from 1,000 systems?

First, we generated percentiles at intervals of 10% (10, 20, 30, ..., 90) for both AOH and rooftop areas, resulting in 64 possible combinations (table 8).

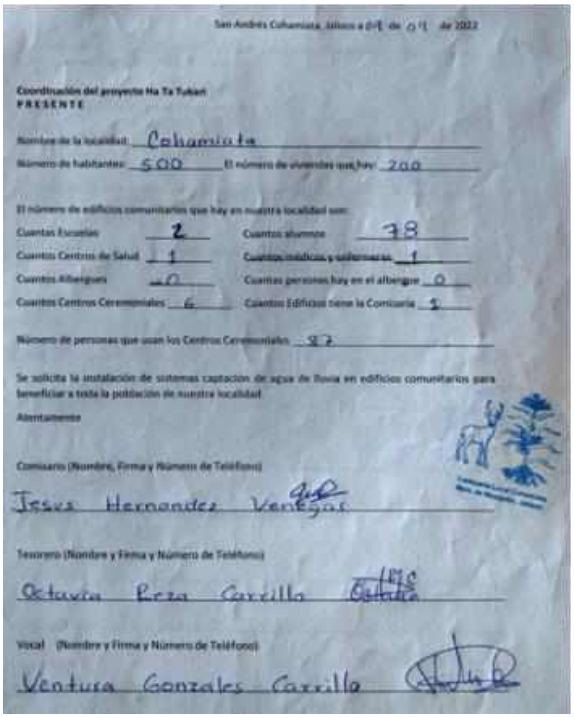
Percentiles (%)	Rooftop area (m^3)	AOH
10	13.7	2.7
20	17.5	3.3
30	20.9	3.7
40	24.6	4.0
50	26.9	4.3
60	32.9	4.7
80	47.9	5.5
90	63.1	6.0

Table 7: Table with the 8 percentile intervals of 10% (10, 20, 30, ..., 90) for AOH and rooftop areas within SAC.

Then, in order to get an estimate of the total cost saved from these systems, we obtained the minimum cost for a liter of water for domestic use in the state of Jalisco, of 0.07631 MXN per liter of water obtained from IMCO (2023). Using a daily water consumption per user of 20 L/per/day, we generated 64 simulations with a water storage tank of 12,000 l and 6 m2 of additional harvesting area, and another 64 simulations with a water storage tank of 14,000 l to have all possible combinations of RWH in SAC. Then we multiplied the total liters harvested and cost saved by both of the 64 simulations and by 15.625 in order to obtain a maximum and minimum estimation for all of the 1,000 RWHS that will be installed.

We can expect that in total, the 1000 RWHS yield a volume per year of 19,904,031 liters (14,000 l tank) to 22,430,281 liters (12,000l tank with an additional 6 m^2 of harvesting area), which represents a total annual savings of 1,518,500 to 1,711,250 MXN respectively.

ANNEX 8
EXAMPLES OF THE CONSULTATIVE PROCESS



San Andrés Cohamiata, Jalisco a [illegible] de [illegible] de 2022

Coordinación del proyecto Ha Ta Tukari
PRESENTE

Nombre de la localidad: Cohamiata
Número de habitantes: 500 El número de viviendas que hay: 200

El número de edificios comunitarios que hay en nuestra localidad son:
Cuantas Escuelas 2 Cuantos alumnos 78
Cuantos Centros de Salud 1 Cuantos médicos y enfermeras 1
Cuantos Albergues 0 Cuantas personas hay en el albergue 0
Cuantos Centros Ceremoniales 6 Cuantos Edificios tiene la Comisaría 1

Número de personas que usan los Centros Ceremoniales [illegible]

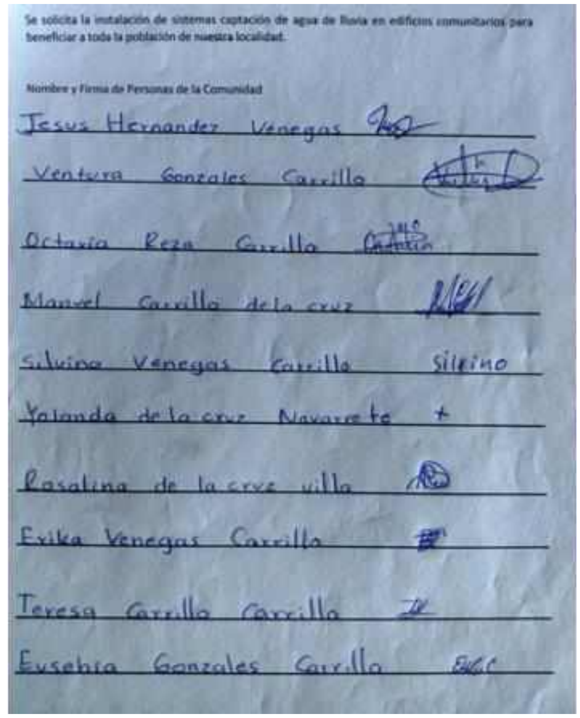
Se solicita la instalación de sistemas captación de agua de lluvia en edificios comunitarios para beneficiar a toda la población de nuestra localidad

Atentamente

Comisario (Nombre, Firma y Número de Teléfono)
Jesus Hernandez Venegas

Tesorero (Nombre y Firma y Número de Teléfono)
Octavia Reza Carrillo

Vocal (Nombre y Firma y Número de Teléfono)
Ventura Gonzales Carrillo



Se solicita la instalación de sistemas captación de agua de lluvia en edificios comunitarios para beneficiar a toda la población de nuestra localidad.

Nombre y Firma de Personas de la Comunidad

Jesus Hernandez Venegas
Ventura Gonzales Carrillo
Octavia Reza Carillo
Manuel Carillo de la cruz
Silvino Venegas Carillo Silvino
Yolanda de la cruz Navarrete +
Rosalina de la cruz villa
Erika Venegas Carrilla
Teresa Carillo Carrilla
Eusebia Gonzales Carilla

1. Cohamiata formal request for the extension of the Project to their locality

COMUNIDAD WIXARIKA, TATEIKIE
SAN ANDRÉS COHAMIATA, MEZQUITIC, JALISCO
OFICINA AGRARIA DE BIENES COMUNALES

A 13 de mayo de 2020

A LLUVIA PARA TODOS A. C.
ISLA URBANA
RED HA TA TAKURI

Los que suscriben, las autoridades agrarias de la comunidad agraria Wixárika Tetei Kie, San Andrés Cohamiata, Mezquitic, Jalisco, aunado a un cordial saludo, por este conducto damos nuestro consentimiento y apoyo para que se lleve a cabo el proyecto "Ha Ta Tukari (agua nuestra vida): Captación de agua de lluvia por el derecho humano al agua en la Sierra Wixárika", para atender la problemática del agua y mejorar el acceso a este recurso mediante la cosecha de agua de lluvia, en los 21 comisarias que son parte de nuestra comunidad.

La comunidad está dispuesta a colaborar en el proyecto, brindando ayuda para el equipo que implemente en proyecto, brindando mano de obra y asistencia para el hospedaje y la alimentación en las comisarias.

Sin otro asunto, agradecemos su atención y reiteramos nuestros saludos cordiales.

ATENTAMENTE
"2020, AÑO DE LA ACCIÓN POR EL CLIMA, DE LA ELIMINACIÓN DE LA VIOLENCIA CONTRA LAS MUJERES Y SU IGUALDAD SALARIAL"
MESA DIRECTIVA DEL COMISARIADO DE BIENES COMUNALES, A 13 DE MAYO DE 2020

PRESIDENTE DEL COMISARIADO DE BIENES COMUNALES
COMUNIDAD WIXARIKA TATEIKIE
SAN ANDRÉS COHAMIATA, MEZQUITIC, JAL.

C. Patricio Ortiz de la Cruz
Comisariado de Bienes Comunales

C. Lino López De La Cruz
Gobernador tradicional de San Andrés Cohamiata

C. Isidro Reza Carrillo
Delegado Municipal de San Andrés Cohamiata

PODER EJECUTIVO DEL PUEBLO WIXARIKA TATEI-KIE

DELEGACIÓN COMUNAL
SAN ANDRÉS COHAMIATA
MUNICIPIO DE MEZQUITIC
JALISCO

Con copia archivo

2. Formal request letter from the Commissioner for Community Property for the RWH project Ha Ta Tukari to operate in the San Andrés Cohamiata Region (right)

ANNEX 9
DIDACTIC MATERIAL

Dirty Water/Clean Water.
Game to promote the benefits of Rain Wather Harvest.

Intercultural Team Procedure Manuals.

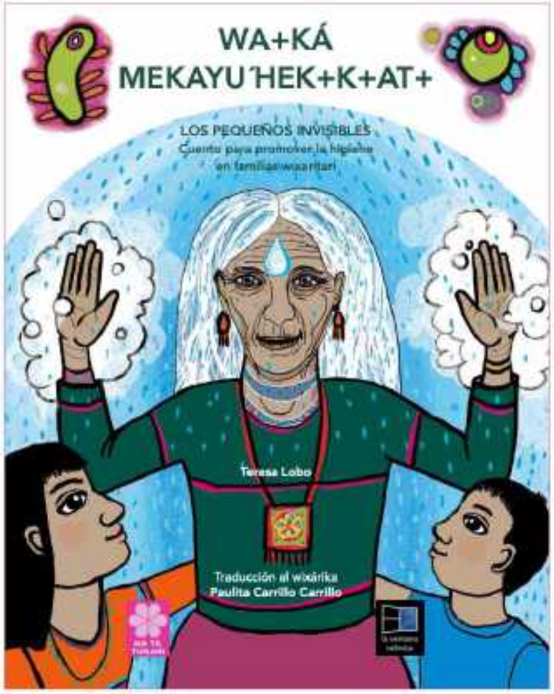
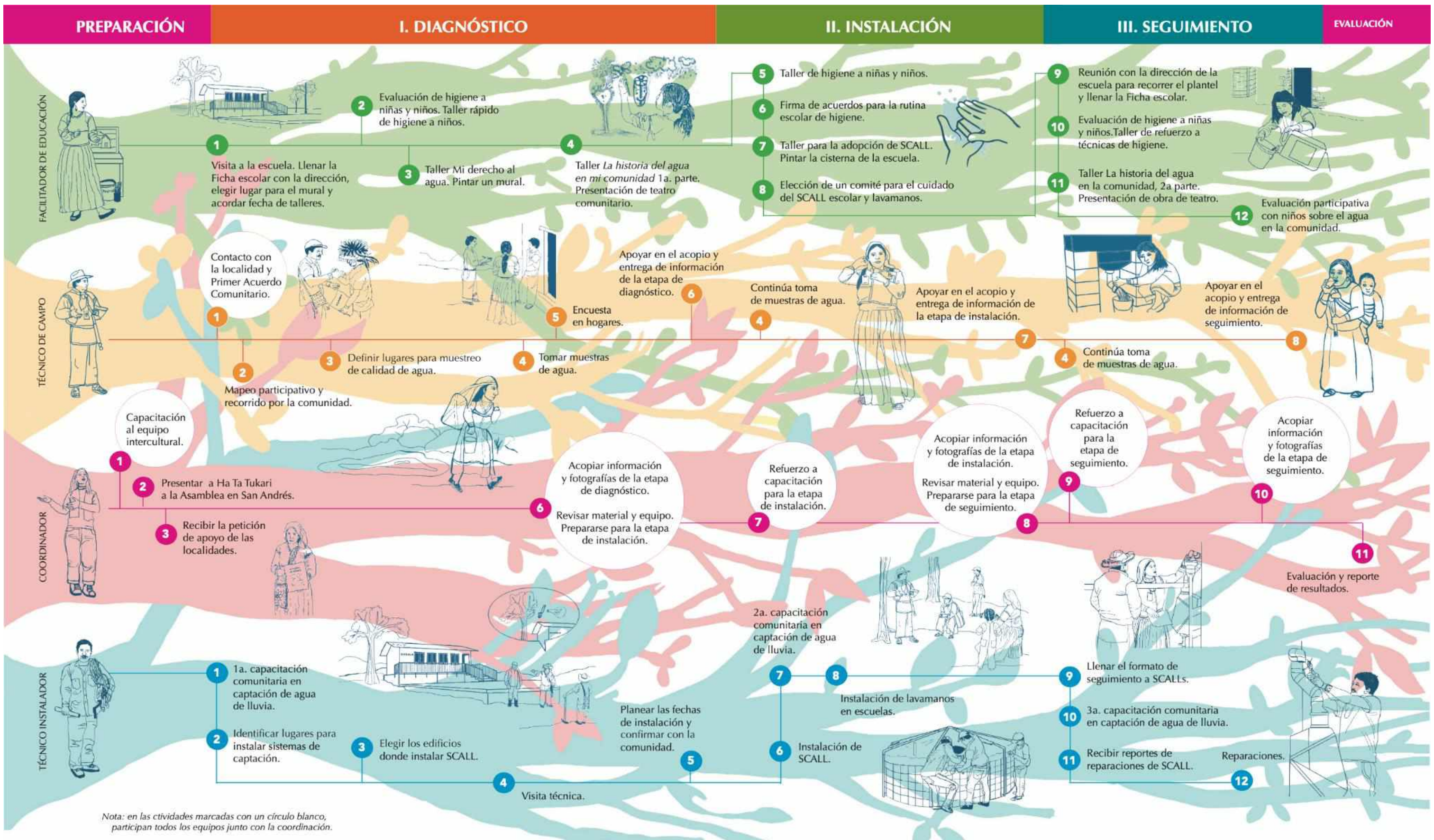


Illustration from the stories The Rain Harvest and The Little Invisibles, to promote RWH and hygiene practices.

ANNEX 10
HA TA TUKARI'S IMPLEMENTATION ROUTE DIAGRAM



ANNEX 11
COMMUNITY DIAGNOSTICS IN SAN ANDRÉS COHAMIATA

HA TA TUKARI / AGUA NUESTRA VIDA
Acceso a Agua y Saneamiento en la Sierra Wixárika, Jalisco
Diagnóstico comunitario de San Andrés Cohamiata

Isla Urbana / La Ventana Infinita / FGRA

Informe elaborado por La Ventana Infinita A.C. e Isla Urbana, en el marco del proyecto FGRA: A. 0432. Ha ta tukari (Agua nuestra vida): Acceso a Agua y Saneamiento en la Sierra Wixárika, Jalisco.

Coordinación de programa Ha Ta Tukari
Shiara K. González Padrón

Integración de diagnóstico
Teresa Lobo

Diseño de instrumentos y análisis
Gabriela Cedillo
Shiara González Padrón
Teresa Lobo
Patricio Orden Islas
Claudia Ríos Ferrer
Carolina Escobar Neira
Enrique Lomnitz
Jesús Sotomayor

Implementación en campo
Joel Bautista López
Mariano Bautista Villa
Joel de la Cruz López
Paulino Díaz Montoya
César López López
Felipe López Moreno
Azucena Parra Parra
Alejandra Parra Pineda
Hemenegildo Ramírez Ramírez

ÍNDICE DE CONTENIDO

Siglas y acrónimos usados en el documento

CONAFE. Consejo Nacional de Fomento Educativo
CONAPO. Consejo Nacional de Población
DIF. Sistema Nacional para el Desarrollo Integral de la Familia
FGRA. Fundación Gonzálo Río Arronte
IDH. Índice de Desarrollo Humano
IMSS. Instituto Mexicano del Seguro Social
IMTA. Instituto Mexicano de Tecnología del Agua
INPI. Instituto Nacional de Pueblos Indígenas
INSABI. Instituto de Salud para el Bienestar
ISSSTE. Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado
PIS Wixárika. Programa de Infraestructura Social Wixárika
PNUD. Programa de Desarrollo de las Naciones Unidas
SAC. San Andrés Cohamiata
SCALL. Sistema de Cosecha de Lluvia
SEP. Secretaría de Educación Pública

INTRODUCCIÓN

Este informe expone los resultados del diagnóstico comunitario realizado en San Andrés Cohamiata para el proyecto: *Ha ta tukari (Agua nuestra vida): Acceso a Agua y Saneamiento en la Sierra Wixárika, Jalisco* (2021-2024) desarrollado por Isla Urbana y La Ventana Infinita A.C., en alianza con el Instituto Mexicano de Tecnología del Agua (IMTA) y bajo el auspicio de la Fundación Gonzalo Río Arronte (FGRA), Casa Córdoba Filantropía e Isla Urbana USA.

Dicho proyecto es parte del Programa Ha ta tukari (Agua nuestra vida), que inició en el año 2010, en la comunidad de La Cebolleta y que, desde 2021, opera en 21 localidades del Núcleo Agrario de San Andrés Cohamiata (SAC), municipio de Mezquitic, Jalisco. El objetivo de este programa es *acompañar el proceso de transformación de comunidades indígenas wixaritari en extrema marginación, co-creando, de manera integral y sinérgica, condiciones para su sostenibilidad social, ambiental, económica y cultural, respondiendo a la emergencia de sus necesidades y tomando como punto de partida el acceso al agua.* El Programa es desarrollado por una red flexible de organizaciones y la comunidad wixárika —sus autoridades agrarias y tradicionales, familias, escuelas, clínicas, organizaciones comunitarias y agentes de cambio locales. A esta red se suman colaboraciones puntuales de organizaciones de la sociedad civil, instituciones públicas, expertos, donadores y voluntarios.

El objetivo de este diagnóstico es profundizar en el entendimiento de la situación actual en la que viven las localidades SAC y generar datos de línea base. Fue implementado en 17 localidades, entre septiembre de 2022 y febrero de 2024 (*véase la tabla 1*). El Núcleo Agrario de SAC consta de 21 localidades, cada una con sus autoridades comunitarias, sin embargo, para fines operativos y de información, el programa Ha Ta Tukari considera como localidades independientes a las rancherías Los Lobos y Tierra Blanca de Huaixtita, por ser muy pobladas y estar separadas geográficamente de la localidad a la que están anexas. La Cebolleta y La Laguna no fueron consideradas en este diagnóstico porque el programa Ha Ta Tukari ha tenido actividad ahí desde 2010 y 2014 respectivamente, por lo que ya contaba con información basal y de monitoreo de ambas localidades, en las que ya hay una cobertura universal de Sistemas de Cosecha de Lluvia (SCALL) en espacios comunitarios y hogares. Este diagnóstico tampoco incluye a las localidades Las Guayabas y Tutu Yekwamama, localidades con las que no se logró establecer el acuerdo de coparticipación comunitario inicial, requisito indispensable para la implementación del programa. Por último, en las localidades de San Miguel Huaixtita y El Chalate sí se realizó el diagnóstico comunitario, pero a la fecha de la integración del presente reporte, el levantamiento de datos aún se encuentra en proceso, por lo que no se incluye en el presente análisis.

El diseño de este diagnóstico comunitario se realizó tomando en cuenta la experiencia de trabajo del programa Ha Ta tukari desde el 2010. A lo largo de los años, se han hecho diversos esfuerzos para obtener información de las localidades donde se implementó el programa Ha Ta Tukari (González-Padrón, 2019a; Ha Ta Tukari, 2019; Lobo, 2019). Estas investigaciones han ilustrado el diseño de instrumentos que ayuden a reducir las brechas culturales, lingüísticas y de dispersión en la que se sitúa el presente diagnóstico. Esta medida ha sido fundamental, dado que los datos oficiales obtenidos en este contexto (INEGI, CONAPO, etc.) no reflejan en su totalidad la realidad en la que viven los pobladores de esta región.

El resultado de este esfuerzo es un diagnóstico de la situación comunitaria amplio y profundo, que abarca gran diversidad de informantes y técnicas de acopio de información, implementado por un equipo local en lengua wixárika y que ofrece la información de línea base necesaria para planear, monitorear y evaluar el programa Ha Ta Tukari en sus siguientes etapas. Más aún, consideramos que es un diagnóstico comunitario auténticamente participativo y que integra procesos de sensibilización, promueve la construcción colectiva del problema del agua en cada localidad.

En la etapa de seguimiento del proyecto, está planeado devolver y verificar la información analizada en reuniones comunitarias, diseñando para ello talleres de entrega y materiales culturalmente adecuados. Así, se dará continuidad a un proceso comunitario de reflexión que promueva el impacto del proyecto y su sostenibilidad a largo plazo, en favor de la autonomía de la Nación Wixárika.

RESULTADOS RELEVANTES

La población del Núcleo Agrario de San Andrés Cohamiata en general no tiene acceso a agua en cantidad y calidad suficientes. El 66% de los hogares acarrea agua desde fuentes naturales, hasta seis veces a la semana, para obtener 13 litros de agua por persona. En las fuentes de agua muestreadas y analizadas por el IMTA, la calidad del agua resultó no ser aceptable para consumo directo, ya que contiene evidencia de bacterias coliformes.
La mayoría de las localidades tienen sistemas centralizados para el abastecimiento de agua, tales como aljibes, piletas cisternas comunitarias, etc., pero sólo el 56% de los hogares tiene acceso a estas fuentes, de los que reciben agua 2.8 días a la semana. Encontramos que el 47% de las obras de infraestructura de agua de la región no funcionan, incluyendo tanques, tuberías hidráulicas, bordos, ollas de agua, bombas eólicas y una represa. Sólo el 44% de las escuelas recibe agua de un sistema centralizado, por lo que madres y padres de familia deben organizarse para llevar agua por acarreo. El 7% de las escuelas no dispone de agua en lo absoluto y en ninguna se observaron lavamanos funcionales.
Los sistemas de saneamiento son prácticamente inexistentes. Hay dos sistemas de drenaje en la región que atienden a cuatro de las 21 localidades. Uno de ellos está conectado a una planta de tratamiento que está descompuesta, por lo que las aguas negras regresan a las fuentes de agua naturales sin tratar. Sólo el 27% de los hogares tiene algún tipo de baño. El 72% de los hogares reporta practicar la defecación a ras del suelo. El 71% de los baños de las escuelas no funciona y en 13% de los planteles escolares se observaron heces al ras del suelo.
En cuanto a las prácticas de higiene son muy deficientes. El 54% de los hogares no usa jabón para lavarse las manos. Sólo el 10.7% de los niños en edad escolar considera que debe lavar sus manos después de ir al baño y ninguno tiene una buena técnica de lavado de manos, de acuerdo a los criterios de la OMS.
El 100% de las localidades detecta erosión en los suelos y cambios en los escurrimientos de agua que viene de las laderas en los últimos 10 años, principalmente la desecación de manantiales y el aumento de sedimento en el agua que baja de las laderas. Los pobladores reportan el aumento de los incendios forestales y la disminución de la producción agrícola, que adjudican principalmente al empobrecimiento del suelo, la erosión, las sequías y las plagas.

Tabla 1. Localidades de San Andrés Cohamiata

Localidades		Número estimado de habitantes	Cuenta con diagnóstico comunitario 2021-2024
1	Ciénega de Guadalupe	546	Sí
2	Cohamiata	1124	Sí
3	El Carrizal	1118	Sí
4	El Chalate	189	En progreso
5	El Huizache	260	Sí
6	El Tempizque	170	Sí

7	Guamuchilillo	371	Sí
8	La Cebolleta	307	Diagnóstico 2016
9	La Laguna	806	Diagnóstico 2016
10	Las Latas	201	Sí
11	Las Guayabas	ND	No se estableció el acuerdo de coparticipación comunitaria
12	Las Pitayas	1034	Sí
13	Las Tapias	371	Sí
14	Los Arcos	186	Sí
15	Los Lobos (ranchería de las Tapias)	265	Sí
16	Palma Chica	292	Sí
17	Popotita	981	Sí
18	San Andrés Cohamiata	3180	Sí
19	San José Tesorero	470	Sí
20	San Miguel Huaixtita	ND	En progreso
22	Tierra Blanca del Chalate	191	Sí
21	Tierra Blanca de Huaixtita (ranchería de San Miguel Huaixtita)	148	Sí
23	Tutu Yekwamama	ND	No se estableció el acuerdo de coparticipación comunitaria
	TOTAL	11,756	

Nota: el promedio de habitantes por hogar es de 5.1.

METODOLOGÍA DE DIAGNÓSTICO

El diagnóstico comunitario fue desarrollado e implementado por el Equipo Intercultural de Ha Ta Tukari. La coordinación del programa estableció los indicadores y diseñó las actividades e instrumentos de acopio de información. El equipo local, conformado por nueve mujeres y hombres wixaritari, participó activamente en el pilotaje, verificación, ajuste y adecuación cultural de los procesos e instrumentos de acopio de información. Posteriormente, implementó todas las actividades de diagnóstico en lengua wixárika durante visitas a las 17 localidades, de aproximadamente una semana de duración.[1]

Se obtuvo información en tres ámbitos: la comunidad, la escuela y el hogar. Se recurrió a una diversidad de informantes buscando representar el universo de la localidad, incluyendo a autoridades comunitarias, informantes clave —personal de salud, maestros, líderes comunitarios, etc.—, así como a mujeres, hombres, niñas y niños.

Las actividades de acopio de información incluyen la aplicación de metodologías participativas, cuestionarios, recorridos comunitarios, observación de técnicas de higiene a estudiantes de primaria y secundaria, así como talleres con grupos focales, que dan voz a mujeres y hombres de todas las edades. Estos talleres fueron diseñados con el método *La Ventana Infinita: trabajo mediante el arte para niños y comunidades en desventaja social* (Lobo 2021).

La información acopiada fue registrada mediante formatos de campo, la plataforma digital Kobotools y fotografías con geolocalización, acopiadas en nubes electrónicas. La información se verificó por observación en campo y triangulación de informantes.
Para contextualizar y complementar la información de diagnóstico comunitario, se incluye en este reporte información de fuentes oficiales, de diversos reportes y productos de investigación del programa Ha Ta Tukari y de la tesis doctoral de Shiara González Padrón titulada: *Procesos de cambio hacia la sostenibilidad: Cosecha de lluvia en comunidades indígenas de la Sierra Wixárika, Jalisco, México*.
Para visibilizar la distancia que hay entre los hogares y las fuentes de agua, se generó un mapa a partir de las coordenadas de las fuentes de agua utilizadas por cada localidad, georeferenciadas en campo. Luego, se mapearon en Google Satellite todos los techos dentro de cada localidad y se calculó la distancia lineal desde cada techo hasta la fuente de agua más cercana. Finalmente, se calculó la distancia promedio de todos los techos por localidad y se multiplicó por dos para considerar tanto el viaje de ida como el de regreso a la fuente de agua.
Para este reporte también se analizó la calidad del agua de fuentes naturales de SAC, en los laboratorios del Instituto Mexicano de Tecnología del Agua (IMTA), de acuerdo a los parámetros establecidos en la norma NOM -127-SSA1-2021.

Tabla 2. Actividades de diagnóstico comunitario

Ámbito	Actividad	Informantes	Técnica de acopio de información	Instrumento de acopio de información	Número de instrumentos aplicados	Muestra
Comunitario	Entrevista a autoridades	Autoridades locales	Aplicación de cuestionario	*Ficha de la localidad* *Listado de fuentes de agua de San Andrés Cohamiata* Registro fotográfico	17	89% de las localidades participantes
	Mapeo participativo	Mujeres, hombres, niñas y niños	Taller participativo			
	Recorrido comunitario	Informantes clave: autoridades, personal de salud, líderes comunitarios, etc.	Observación para verificación y registro de información			
	Creación colectiva de la historia del agua en mi comunidad	Mujeres y hombres en grupo focal	Taller participativo	*Formato de recolección de información de la historia del agua en mi comunidad*	18	95% de las localidades participantes. Grupo focal promedio de 12 participantes, 58% mujeres, 42% hombres.
Hogar	Encuesta en hogares	Adultos en sus hogares	Aplicación de cuestionario	*Cuestionario del hogar*	177	8.5% de los hogares*

Escuela	Entrevista con la dirección escolar	Docentes / dirección escolar de preescolares, primarias y secundarias.	Aplicación de cuestionario	*Ficha escolar* Registro fotográfico	22	51% de las escuelas de educación básica
	Recorrido por el plantel escolar		Observación para verificación y registro de información			
	Evaluación de técnica de lavado de manos y cara de niñas y niños	Estudiantes de primaria y secundaria	Observación y registro de información	Evaluación a niñas y niños Registro fotográfico	148	9.4% de los estudiantes de primaria y secundaria
	Diagnóstico de prácticas de higiene y saneamiento de niñas y niños		Aplicación de cuestionario			

*La muestra de 8.5% de hogares no considera los de la población de San Miguel Huaixtita y de El Chalate. Este reporte contiene información de ambas localidades obtenidas por diversos instrumentos, pero no se realizó el diagnóstico en hogares.

NOTA: las citas entre comillas a lo largo de este documento no necesariamente son el dicho textual de los informantes, sino su traducción al español o su transcripción resumida, realizada *in situ* por miembros wixaritari del Equipo Intercultural.

[1] En estas visitas el equipo local, simultáneas al diagnóstico comunitario, realizó acuerdos comunitarios, visitas técnicas y actividades para la promoción de SCALL y prácticas de higiene y saneamiento.

I. CONTEXTO SOCIODEMOGRÁFICO

UBICACIÓN

Los wixaritari viven en una porción de la Sierra Madre Occidental conocida como Sierra Wixárika, donde colindan los estados de Jalisco, Nayarit, Zacatecas y Durango, distribuidos en cinco cabeceras poblacionales o comunidades agrarias: San Andrés Cohamiata, Santa Catarina Cuexcomatitlán, San Sebastián Teponahuaxtlán, Tuxpan de Bolaños y Guadalupe Ocotán.

Figura 1. Mapa de Núcleos agrarios wixaritari (González-Padrón et al.*, 2024, basado en INEGI, 2021a; INEGI, 2021b; Ochoa-García, 2001.)*

ASPECTOS SOCIOCULTURALES

La Nación W*ixárika* es una de las naciones indígenas que ha resistido a la presión de la modernidad en México; preserva su lengua y vive bajo sus creencias espirituales tradicionales, conocidas como *El Costumbre*, que desciende de sus ancestros prehispánicos y se van adaptando con el pasar de los años. Los wixaritari (plural de wixárika) han adquirido visibilidad por la riqueza de su cultura, su arte, su espiritualidad y sus prácticas tradicionales. Su ritmo de vida está sujeto a un calendario agrícola y religioso que los compromete al cumplimiento de “El Costumbre”, mediante ofrendas, peregrinaciones y ceremonias a las diferentes deidades que regulan la vida. “El Costumbre” les otorga identidad, un claro sentido de pertenencia y una fuerte relación con su territorio y sus recursos.

Durante siglos y hasta el final del siglo XX, los wixaritari no contaban con infraestructura de ningún tipo, se asentaban en pequeños poblados cerca de ojos de agua y manantiales, distribuidos en su territorio que se caracterizaba por sus densos bosques, abundantes en flora y fauna. El desarrollo de la infraestructura en la región empezó con pistas de aterrizaje y el establecimiento de escuelas públicas. En los años ochenta y noventa se abrieron caminos transitables y más tarde, se instaló la red eléctrica. Estos servicios, aunados a los programas

asistenciales de gobierno, han atraído gradualmente a la población dispersa de las rancherías hacia asentamientos más grandes, que se mencionan en este informe como localidades o comisarías. Sin embargo, la infraestructura instalada no siempre ha traído los beneficios esperados a la región. De acuerdo a los pobladores locales, la llegada de carreteras resultó en la tala masiva del bosque, que se ha reducido drásticamente en las últimas décadas y la mayoría de las obras de infraestructura son precarias, inapropiadas, ineficientes e insuficientes, lo que llega al extremo en el caso de la infraestructura para el acceso al agua y saneamiento.
El acceso a servicios básicos en la región se ve obstaculizado por varios factores: el complejo relieve del terreno, la estructura socio-política y cultural, así como la falta de atención de las autoridades federales, estatales y municipales. A esto se suman los desafíos de seguridad agravados en los últimos años por la guerra entre los cárteles de Sinaloa y Jalisco Nueva Generación, que se disputan el control del camino que conecta a Jalisco con el norte del país.

GRADO DE MARGINACIÓN

El municipio de Mezquitic está catalogado por el Consejo Nacional Poblacional con “Muy Alto Grado de Marginación” (CONAPO, 2020) y es el cuarto municipio con el índice de rezago social más alto a nivel nacional, tiene el menor índice de desarrollo humano del estado (0.44), y el menor índice de salud de todo el país (0.32) (CONEVAL, 2021b). El 89.2 % de la población se encuentra en pobreza y el 55.6% en pobreza extrema (CONEVAL 2024). La situación se refleja en la alta tasa de mortalidad infantil municipal (76.66 en el municipio, mientras que la tasa nacional es de 16.76.) (CONAPO, 2020; INEGIb, 2020).

Tabla 3. Índice y grado de marginación, 2020

Municipio	Índice de marginación	Lugar que ocupa en el contexto estatal	Lugar que ocupa en el contexto nacional	Grado de marginación
Mezquitic	31.26	1	4	Muy Alto

POBLACIÓN Y DISTRIBUCIÓN

Se trata de una región con variaciones de elevación abruptas —entre los 600 y 2,200 metros—, topografía que resulta en una flora y fauna muy diversas. La mayoría de los wixaritari vive en localidades de menos de 500 habitantes y en pequeños caseríos de muy difícil acceso. Los poblados están distribuidos en mesetas entre las grandes cañadas y cañones que dominan el territorio. Aún cuando puedan parecer cercanos en un mapa, transitar entre estos poblados suele implicar horas de manejo o caminata.

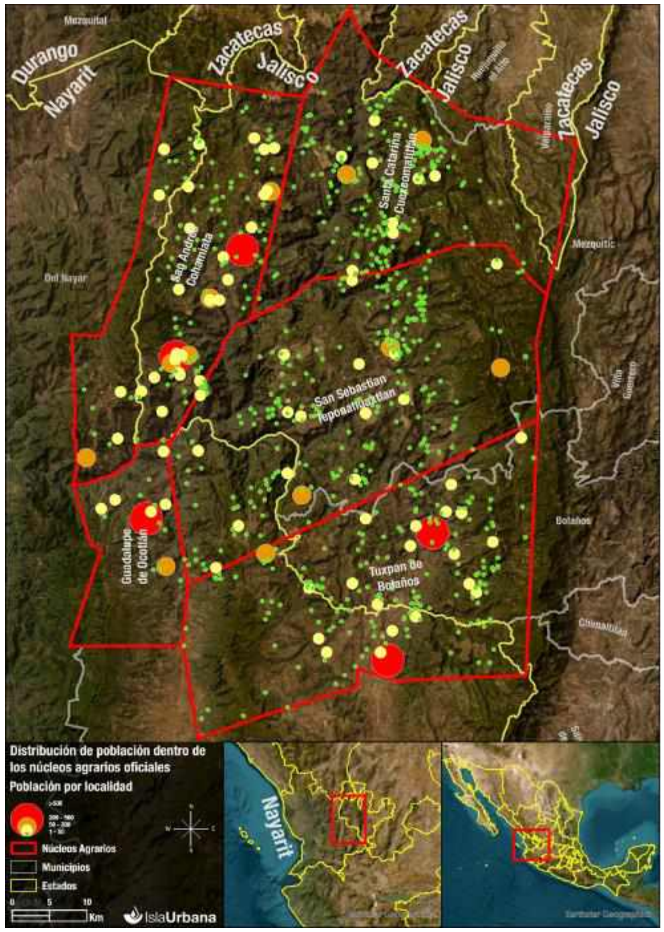


Figura 2. Distribución poblacional dentro de los 5 núcleos agrarios (González-Padrón et al*., 2024, basado en INEGI, 2021a; INEGI, 2021b; Ochoa-García, 2001.)*

Su condición de población rural dispersa y el hecho de que tienen un patrón de migración anual, hace muy difícil obtener información demográfica en la región. Consideramos que las cifras oficiales subestiman la población del municipio de Mezquitic que, según el censo de INEGI, 2020, asciende a los 22,083. De acuerdo a nuestras propias estimaciones, tan sólo la población del Núcleo Agrario de San Andrés Cohamiata es mayor a los 12,500 habitantes (*véase la tabla 1*). Actualmente, las autoridades locales actuales están levantando un censo que nos permitirá conocer mejor a su población y contrastar nuestros datos.

Estimamos que la población de SAC oscila entre los 13,250 y los 13,800 habitantes, distribuidos en 21 localidades. El 18.3% de los hogares están dispersos en 91 rancherías. La media de hogares por ranchería es de 7 y la moda de 3/1.

Los hogares están constituidos por una media de 5.1 personas, por lo general la familia nuclear y ocasionalmente algunos miembros de la familia extendida, como padres y hermanos.

Tabla 4. Población distribuida en localidades y rancherías

Localidad	# de habitantes	# de hogares en la localidad	# de hogares en el centro de población	Rancherías	# de hogares en la ranchería	% de hogares en rancherías	# de rancherías
	525	103	90		13	12.6	1

1. Ciénega de Guadalupe				Pájaro Azul	13		
2. Cohamiata	1081	212	212		0	0	0
3. El Carrizal	1076	211	90		121	57.3	17
				Bajío del Carrizal	15		
				Campamento	10		
				El Bosque (T+ranita)	12		
				El Sapo (Temuta)	6		
				El Saus	5		
				Hakatita	10		
				La Garza Parada (Kwaxu Ma Yewe)	4		
				Las Peñas	10		
				Los Cántaros	3		
				Los Pinos	1		
				Matamoros (Mata Murita)	10		
				San Antonio	6		
				San Francisco	5		
				San Nicolás	8		
				Santa Clara	3		
				Techalote (Tek+ Kie)	5		
				Tierras Colorada (Mukuxeta)	8		
4. El Chalate	189	37	8		29	78.4	8
				Cordón	5		
				Santa Fé	5		
				Venado	3		

				Metsikarita	1		
				La Garza	2		
				Huizache	5		
				Kirita	5		
				Yukuta	3		
5. El Huizache	250	49	49		0	0	0
6. El Tempizque	163	32	20		12	37.5	3
				Chalatita	6		
				Mirador	2		
				Rancho Nuevo	4		
7. Guamuchililllo	357	70	66		4	5.7	1
				Pedregal			
8. La Cebolleta	296	58	42		16	27.6	4
				ND (Sobre el camino a San Miguel)			
				ND (Casa de Amalia)			
				ND (Casa de Alberto)			
				ND (Casa de Otilio)			
9. La Laguna	775	152	118		34	22.4	9
				San Antonio	4		
				El Mosquito	3		
				Metatita	4		
				Ciruelillo	3		
				San Antonio	4		
				Las Escobas	5		

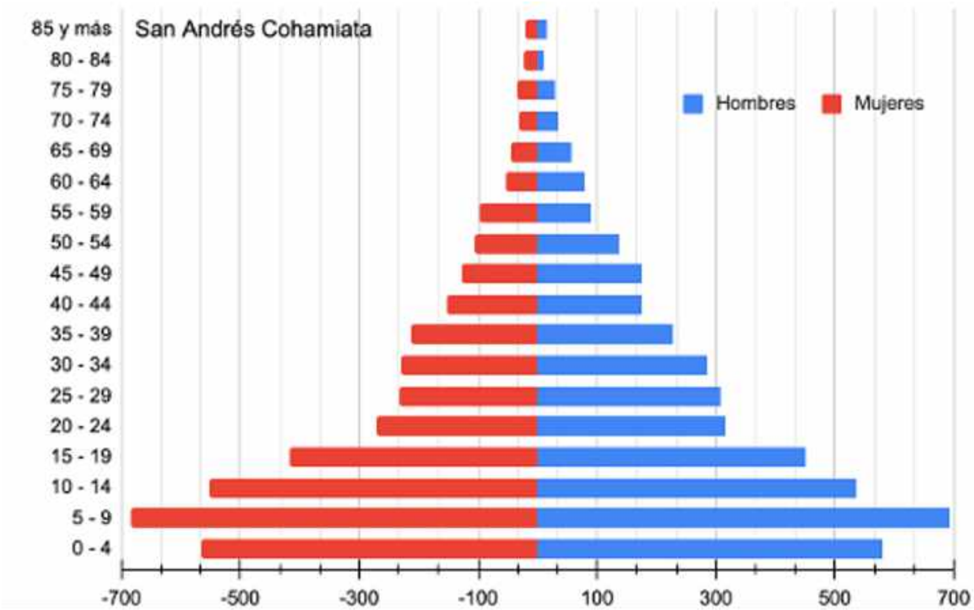
				Las Pulgas	3		
				El Venado	1		
				Los Encinos	7		
10. Las Guayabas	ND	ND	ND	ND	ND	ND	ND
11. Las Latas	194	38	6		32	84.2	8
				El Pedregal	4		
				Ixtalpa	5		
				La Cueva	3		
				La Peñita	2		
				Las Savilas	10		
				Los Aires	3		
				Los Lirios	4		
				Rancho Escondido	1		
12. Las Pitayas	995	195	189		6	3.1	2
					5		
				Maxa Mu'u	1		
13. Las Tapias	357	70	70		0	0	
				Rancho Nuevo*	ND		
14. Los Arcos	179	35	20		15	42.9.3	4
				Tupie (Centro Ceremonial)	0		
				Tkwixipa	4		
				Epaxita	2		
				Manu Eka (Los Aires)	6		
				Mukatapuya	3		
15. Los Lobos (ranchería de las Tapias)	255	50	43		7	14	
				Tierra Blanca de Los Lobos	7		

16. Palma Chica	281	55	48		7	12.7	
				Los Espejos	7		
17. Popotita	944	185	86		99	53.5	10
				Chalate	10		
				La Nariz	7		
				Las Flores	9		
				Limón	6		
				Mezquite	12		
				Naranjo	6		
				Roblito	5		
				San Juan de Popotita	36		
				San Lucas	7		
				Zapote	1		
18. San Andrés Cohamiata	3060	600	600		0	0	0
19. San José Tesorero	454	89	44		45	50.6	5
				Aguasarca	9		
				Bajío de San José	12		
				El Tesorero	10		
				Kwatsarita	2		
				Los Toros	12		
20. San Miguel Huaixtita	ND	285	38		247	86.7	7
				Nuevo Progreso	13		
				San Luis	30		
				Tecolote	90		
				Bella Vista	40		
				Mirador	35		

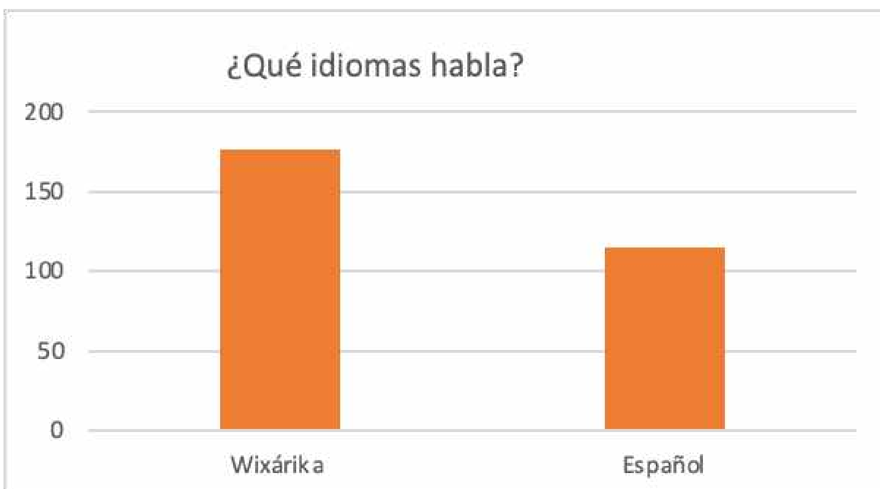
				Ciruelillo	6		
				El Roble	33		
21. Tierra Blanca del Chalate	191	36	28		8	22.2	2
				Mukuxiuya	2		
				Uxawerita	6		
22. Tierra Blanca de Huaixtita	148	28	1		27	96.4	
				Huanacaxtle	1		
				Kaitsa Makawe	6		
				Mukutuxa	7		
				Tsinata	1		
				Tuapurie	4		
				Xakrita	2		
				Xamuakaripa	4		
				Yemuritsie	2		
23. Tutu Yekwamama	ND	ND	ND		ND	ND	ND
TOTAL	11756	2590	1868		475	18.3	91

*No aparece en la ficha de la localidad, pero se menciona en la historia del agua. Al parecer pertenecía a las Tapias, pero ahora sus pobladores se consideran anexos a Nayarit.

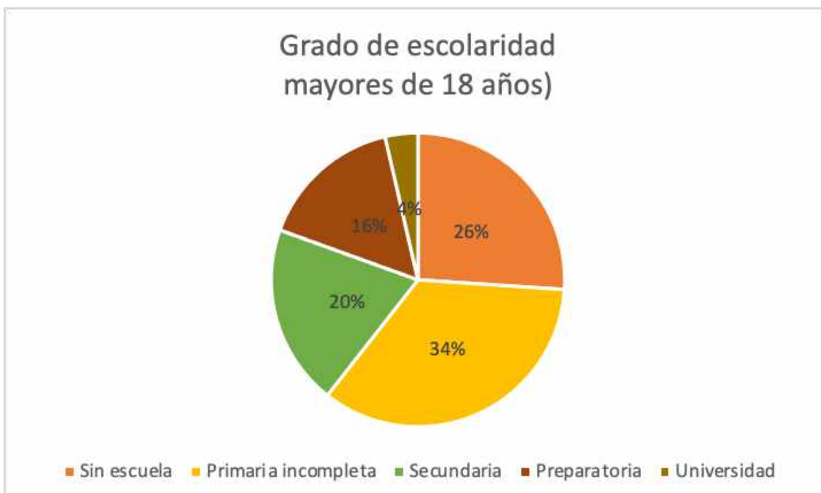
Pirámide de Población del Núcleo Agrario de San Andrés Cohamiata (Inegi 2020)



El 100% de la población es indígena y habla la lengua wixárika. El 65% habla español como segunda lengua. El 67% de los informantes en el hogar reconocieron saber leer y escribir.



El 60% de los mayores de 18 años no concluyó la educación primaria. Sólo el 16% estudió preparatoria y el 4% concluyó una carrera.



Las principales razones de deserción escolar son la falta de recursos, la lejanía de las escuelas del lugar de residencia y la negativa de los padres, a veces asociada a evitar el aculturamiento (que es el proceso de adquirir rasgos o elementos de cualquier otra cultura.

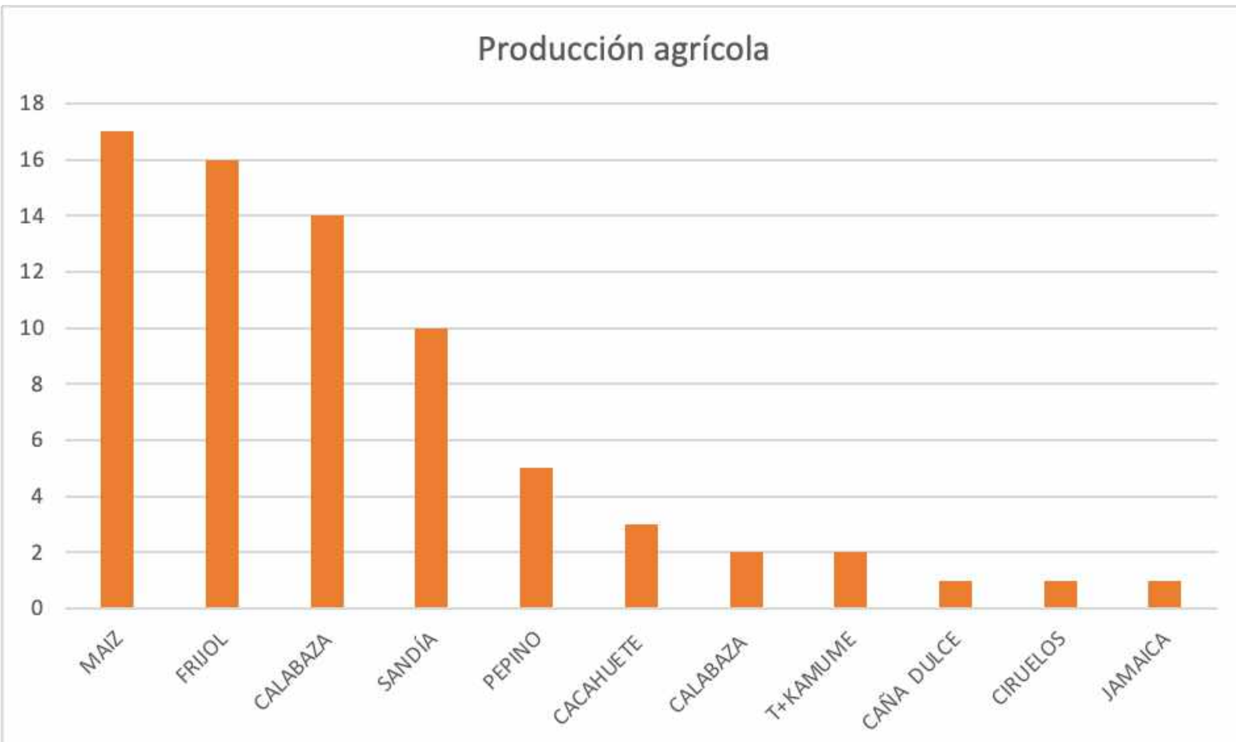
Se recopilaron frases como:
“No había escuela tan cerca y por eso ya no pudo continuar”.
“Tenía que salir fuera y lejos de su pueblo”.
“Por la familia que mantener.”
“Por falta de dinero”.
“Por la decisión de sus papas, no lo dejaron estudiar”.
“Sus padres no lo dejaron ir a la escuela, solo a la cultura”.
(Cuestionario del hogar)

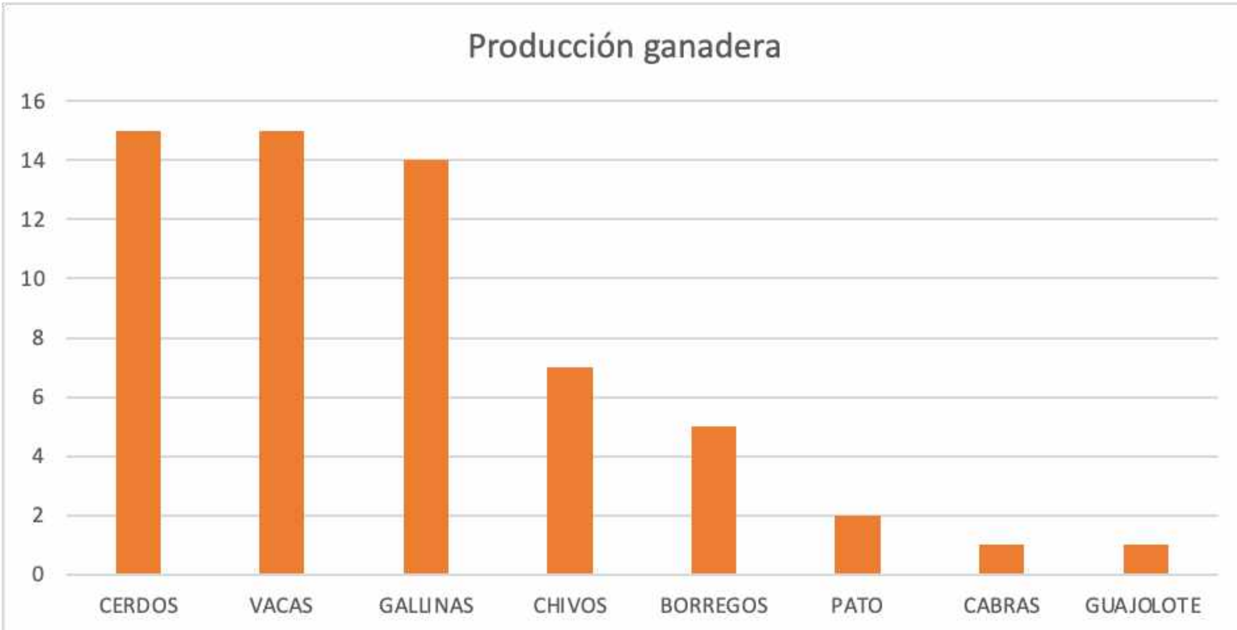
II. MEDIOS DE VIDA

Los wixaritari son principalmente agricultores y viven del autoconsumo de maíz, frijol, calabaza, así como de animales de traspatio, la producción de artesanías y del trabajo del jornal en la agroindustria regional. Los niños colaboran en las principales actividades productivas y en las labores del hogar conforme crecen, a partir de los 5 o 6 años.

Las actividades que realizan a cambio de un pago son docencia, albañilería y servicio público.

Sólo el 7.3% de la población cuenta con un seguro médico (INSABI, IMSS o ISSSTE). El 49% de los informantes es beneficiario de algún programa social (Bienestar, Procampo, 70 y más).





El 94% de los hogares crían animales en su solar, principalmente cerdos, vacas y gallinas. 32% de los hogares cría animales en un rancho o encierro fuera de su vivienda.
Las localidades aprovechan diversos recursos del bosque, reportando como los más usados el agua, la leña y la madera de encino, pino, roble huizache y nanchi. También se reportó el aprovechamiento de flora y fauna comestibles y con fines medicinales, así como el uso de tierra de monte, barro para adobes y piedra para construcción.

III. VIVIENDA Y SERVICIOS BÁSICOS

SERVICIOS E INFRAESTRUCTURA EN LAS LOCALIDADES

La mayoría de los caminos son terracerías muy difíciles de transitar y algunas localidades, como Los Arcos y Los Lobos, sólo se puede acceder a pie o en burro. Hace unos años, se pavimentó el camino de SAC a La Cebolleta, pero la capa de pavimento resultó muy frágil y en el transcurso de tres años prácticamente quedó destruida. Actualmente, la comunidad de SAC está construyendo una carretera entre La Cebolleta y San Miguel Huaixtita, con mano de obra local y el financiamiento del Instituto Mexicano de Pueblos Indígenas.
Los servicios en todas las localidades son escasos e ineficientes y no llegan a todos los hogares de la localidad, ni a las rancherías. *"Sólo los que están a las orillas del camino cuentan con estos servicios"* (*Ficha de la localidad*). El 73.6% de las localidades tiene red eléctrica, pero el servicio es intermitente. Sólo 15.7% de las localidades tiene drenaje. En el caso de SAC, este conduce a una planta de tratamiento que no está operando, por lo que las aguas negras sin tratar regresan a los arroyos contaminando las fuentes naturales de agua. Sólo dos localidades, de las más aisladas, tienen un teléfono fijo comunitario, *"Lo ocupan cuando es necesario y urgente"* (*Ficha de la localidad*). En toda la región la señal de celular es mala e intermitente.

Tabla 5. Servicios básicos con que cuentan las localidades

Localidad	Electricidad	Drenaje	Teléfono
Ciénega de Guadalupe	1	0	0
Cohamiata	1	0	0
El Carrizal	1	1	0
El Chalate	1	0	0
El Huizache	1	0	0
El Tempizque	0	0	0
Guamuchililo	1	0	0
Las Latas	0	0	1
Las Pitayas	1	1	0
Las Tapias	1	0	0
Los Arcos	0	0	0
Los Lobos	1	0	1
Palma Chica	1	0	0
Popotita	1	0	0
San Andrés Cohamiata	1	0	0
San José Tesorero	1	0	0
San Miguel Huaixtita	1	1	0
Tierra Blanca de Huaixtita	0	0	0
Tierra Blanca del Chalate	0	0	0
TOTAL	14	3	2

Servicios de salud

El 10.5% de las localidades no tiene ningún tipo de servicio médico. El 63% tiene una Casa de Salud, donde no hay personal médico ni medicamentos, sólo un auxiliar cuya principal función es administrar suero antialacrán. Una vez al mes asiste una brigada médica a vacunar y a ofrecer consultas. En las localidades más pobladas (el 26.5%) hay Consultorios Populares o clínicas en los que, aunque escasos, sí hay personal médico, medicamentos, cuentan con el servicio de ambulancia y pueden llamar a un helicóptero ambulancia. Estas son Ciénega de Guadalupe, que comparte servicios médicos con San Miguel; Las Pitayas, que comparte con SAC, y Popotita. Estimamos que en todo el Núcleo Agrario de SAC hay un médico por cada 1,469 habitantes y 2.3 enfermeras(os) por cada médico, cuando la recomendación de la Organización Mundial de la Salud es entre 2 y 3 médicos por cada mil habitantes y 3 enfermeras(os) por doctor.

Tabla 6. Servicios de salud con que cuentan las localidades

Localidad	Centro de Salud	Ambulancia	Número de médicos	Número de enfermeras(os)
Ciénega de Guadalupe (comparte con San Miguel)	0	0	0	0
Cohamiata	1	0	0	0
El Carrizal	1	0	0	0
El Chalate	1	0	2	2
El Huizache	1	0	0	1
El Tempizque	1	0	0	1
Guamuchililllo	1	0	0	1
Las Latas	1	0	0	0
Las Pitayas (comparte con San Andrés)	0	0	0	0
Las Tapias	1	0	0	2
Los Arcos	0	0	0	0
Los Lobos	1	0	0	0
Palma Chica	1	0	0	1
Popotita	1	1	3	2
San Andrés Cohamiata	1	1	1	6
San José Tesorero	1	0	0	0
San Miguel Huaixtita	1	1	1	3
Tierra Blanca de Huaixtita	1	0	0	0
Tierra Blanca del Chalate	0	0	0	0
TOTAL	16	3	8	19

Escuelas

En el Núcleo Agrario de SAC existen 52 escuelas. Hay 22 escuelas preescolares, dependientes del CONAFE, 21 primarias de la SEP y 6 Telesecundarias. Hay preparatoria en SAC, San Miguel Huaixtita y Popotita. El 94% de las localidades cuentan con escuelas preescolar y primaria. Con excepción de Los Arcos, que es una de las localidades más pequeñas y aisladas, los niños tienen acceso a los primeros niveles escolares en su propia localidad. Sin embargo, para continuar sus estudios, la mayoría de los menores debe trasladarse a otras localidades, ya que sólo el 35% cuenta con secundaria y el 12% con preparatoria. Hay un docente por cada 18 estudiantes.

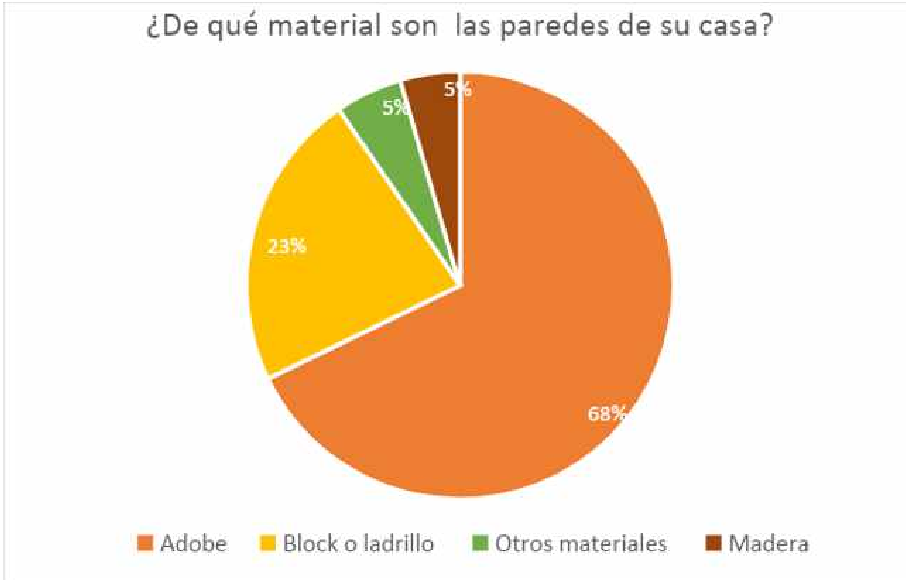
El 54% de las escuelas cuenta con comedor escolar donde se sirve un almuerzo a las niñas y niños una media de cuatro veces a la semana.

Tabla 7. Población escolar

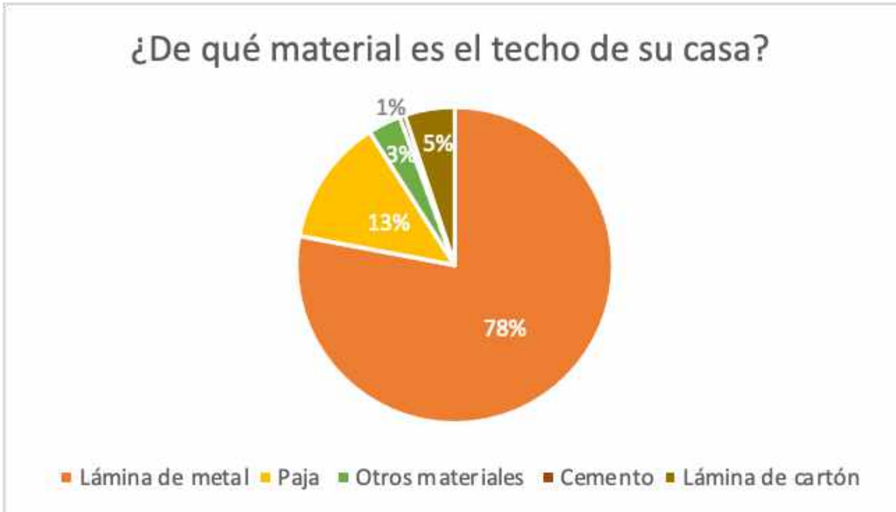
Localidad	Número de escuelas					Número de estudiantes				
	Preescolar	Primaria	Secundaria	Preparatoria	Total	Preescolar	Primaria	Secundaria	Preparatoria	Total
Ciénega de Guadalupe	1	1	0	0	2	32	83	0	0	115
Cohamiata	1	1	0	0	2	15	63	0	0	78
El Carrizal	1	1	1	0	3	9	32	40	0	81
El Chalate	1	1	1	0	3	20	126	38	0	184
El Huizache	1	1	0	0	2	4	15	0	0	19
El Tempizque	1	1	0	0	2	4	13	0	0	17
Guamuchilillo	1	1	1	0	3	16	36	8	0	60
Las Latas	1	1	0	0	2	10	24	0	0	34
Las Pitayas	1	1	1	0	3	ND	ND	197	0	197
Las Tapias	1	1	0	0	2	20	60	0	0	80
Los Arcos	0	0	0	0	0	0	0	0	0	0
Los Lobos	1	1	1	0	3	10	13	35	0	58
Palma Chica	1	1	0	0	2	12	26	0	0	38
Popotita	5	4	1	1	11	46	36	64	16	162
San Andrés Cohamiata	1	1	1	1	4	67	350	360	70	847
San José Tesorero	1	1	0	0	2	18	67	0	0	85
San Miguel Huaixtita	6	5	1	1	13	26	263	125	80	494
Tierra Blanca de Huaixtita	1	1	0	0	2	6	8	0	0	14
Tierra Blanca del Chalate	1	1	0	0	2	ND	ND	0	0	ND
TOTAL	29	27	8	3	67	320	1247	876	166	2609

VIVIENDA

Un mismo solar familiar puede incluir varios hogares, cada uno con su propia vivienda. En ocasiones estos hogares pueden compartir cocina, corrales o carretones, que son construcciones muy precarias de carrizo y paja, generalmente utilizadas para guardar grano y enseres agrícolas. La mayoría de las casas están hechas de adobe, tienen piso de tierra y techo de lámina galvanizada. Los hogares utilizan uno o dos cuartos para dormir y una cocina abierta o cerrada. Muchas de las actividades cotidianas se desarrollan en el solar familiar. El 5% de los hogares viven en carretones.


¿De qué material son las paredes de su casa?
5%
5%
23%
68%
Adobe
Block o ladrillo
Otros materiales
Madera


¿De qué material es el piso de su casa?
6%
37%
57%
Tierra
Cemento
Madera



Los bienes de consumo y servicios son muy escasos. El 16% de los hogares tiene un televisor, el 11% cuenta con refrigerador, el 6% tiene un teléfono, el 5% cuenta con una computadora, el 5% tiene un coche o camioneta y sólo 1% tiene servicio de internet. El 60% de los hogares no cuenta con ninguno de estos servicios.

IV. SITUACIÓN DE AGUA Y SANEAMIENTO

ACCESO AL AGUA

Si bien la gravedad de la situación de acceso al agua varía en cada localidad, en general, la población del Núcleo Agrario de SAC no tiene acceso a agua en cantidad y calidad suficientes.
La cantidad de agua que se utiliza por persona oscila entre los seis y ocho litros diarios, (González-Padrón 2019b), lo que es insuficiente para tener una vida digna según la Organización Mundial de la Salud (OMS), que establece un mínimo de 20 litros al día por persona.
La población depende del agua que encuentra en los manantiales y los llamados “ojos de agua", pozas abiertas que dependen de la recarga de la lluvia a los manantiales (González-Padrón 2019a), distribuidos en el paisaje montañoso, arroyos de temporal y el río Santa Clara, que pasa

por la localidad El Carrizal. Algunos de estos ojos de agua se destinan al ganado, porque son turbios o tienen mal sabor. También hay algunas fuentes de aguas termales con sales y alta temperatura en las rancherías Tesorero y San Miguel Huaixtita. En la tabla 8 se muestran el número y tipo de fuentes de agua por localidad

El agua es parte central del "costumbre" wixárika. A lo largo del territorio, hay ojos de agua que la comunidad considera sagrados. La población y las autoridades agrarias actuales los consideran de suma importancia y están destinando gran esfuerzo a registrar su geolocalización.

> "Cuentan los abuelos que el agua es una medicina para que no te enfermes mucho. A las 5 se bañaban para que te sintieras mejor."
>
> "Ofrendaban jícaras, flechas, ojos de dios en los ojos de agua, para mantenerlos vivos."
>
> "Antes sí había suficiente agua, se producían vino y sembraban ojos de agua tradicionalmente, con ceremonias."

El 64% de los hogares obtiene su agua principalmente de fuentes naturales, mediante el acarreo o por medio de mangueras que conducen el agua por gravedad desde un manantial.

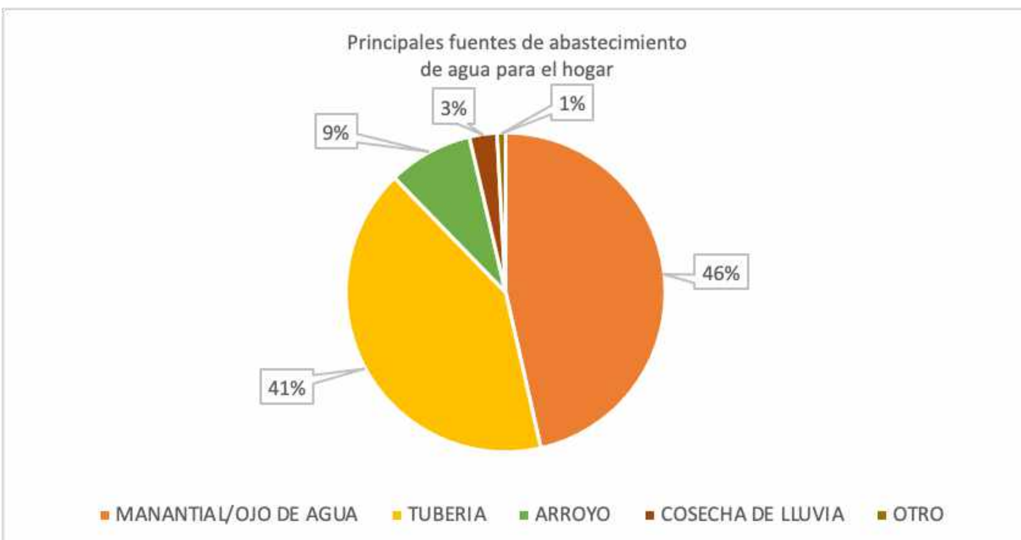


Tabla 8. Fuentes de agua en las localidades de San Andrés Cohamiatha

			NÚMERO DE FUENTES NATURALES DE LAS QUE OBTIENEN AGUA			NÚMERO DE OBRAS DE INFRAESTRUCTURA CENTRALIZADA					NÚMERO DE SCALL	
LOCALIDAD	NÚMERO DE HOGARES	RECORRIDO PROMEDIO (m) A FUENTES DE AGUA	OJO DE AGUA	MANANTIAL	RÍO	TANQUE DE AGUA POTABLE	CISTERNA DE AGUA POTABLE	AGUA POTABLE DIRECTA	BORDO DE ABREVADERO	REPRESA (CORTINA)	COMUNITARIOS	EN HOGARES
Ciénega De Guadalupe	103	706	0	2	0	1	0	0	0	0	0	0
Cohamiata	212	418	2	1	0	1	0	0	0	0	0	0

El Carrizal	132	534	2	0	1	1	0	0	0	1	0	1
El Chalate	ND	1316	0	1	0	1	1	0	0	0	0	0
El Huizache	49	ND	2	0	0	0	1	0	0	0	0	0
El Tempizque	32	536	3	0	0	0	1	0	0	0	0	0
Guamuchilillo	70	686	7	0	0	1	0	0	0	0	0	0
La Cebolleta	48	4616	1	0	0	0	0	0	0	0	4	48
La Laguna	111	398	5	1	0	2*	0	0	0	0	4	91
Las Latas	36	194	0	5	0	1	0	0	0	0	0	0
Las Guayabas	ND	1138	2	1	0	1*	0	0	0	0	0	0
Las Pitayas	125	856	11	0	0	0	0	0	0	0	0	ND
Las Tapias	300	1118	0	0	0	2	0	0	1	0	0	0
Los Arcos	55	4168	3	0	0	0	0	0	0	0	0	0
Los Lobos	50	ND	0	1	ND	ND	ND	ND	ND	ND	0	0
Palma Chica	55	644	0	0	0	1	0	0	0	0	0	0
Popotita	516	780	2	2	0	1	0	0	1	0	0	0
San Andres Cohamiata	170	856	5	1	0	4	0	0	0	0	0	ND
San José Tesorero	55	650	7	0	0	1	0	0	0	0	0	2
San Miguel Huaixtita	ND	948	1	0	0	6	0	0	0	0	0	0
Tierra Blanca del Chalate	36	396	3	0	0	1	0	1	0	0	0	0

Tierra Blanca de Huaixtita	28	ND	1	0	N D	ND	ND	ND	ND	ND	0	0
Tutu Yekuwamama	ND	1084	0	0	0	0	1	0	0	0	0	0
TOTAL	2,2 28	ND	57	15	1	25	3	1	2	1	8	142

EL ACARREO

El 66.3% de los hogares acarrea agua desde fuentes naturales en promedio seis veces a la semana, para obtener por este medio 13 litros de agua por persona al día. El acarreo es una actividad particularmente difícil, porque en muchas localidades hay que bajar a buscar el agua a las cañadas, por caminos muy empinados y peligrosos.

Tabla. Acarreo de agua por hogar

	Veces a la semana que acarrean los hogares	Cantidad de litros que acarrean cada vez	Agua obtenida por acarreo (litros diarios por persona)
Temporada de secas	4.3	41.5	6.9
Temporada de lluvias	7.8	69.4	19.3
Promedio anual	6	55.4	13.1

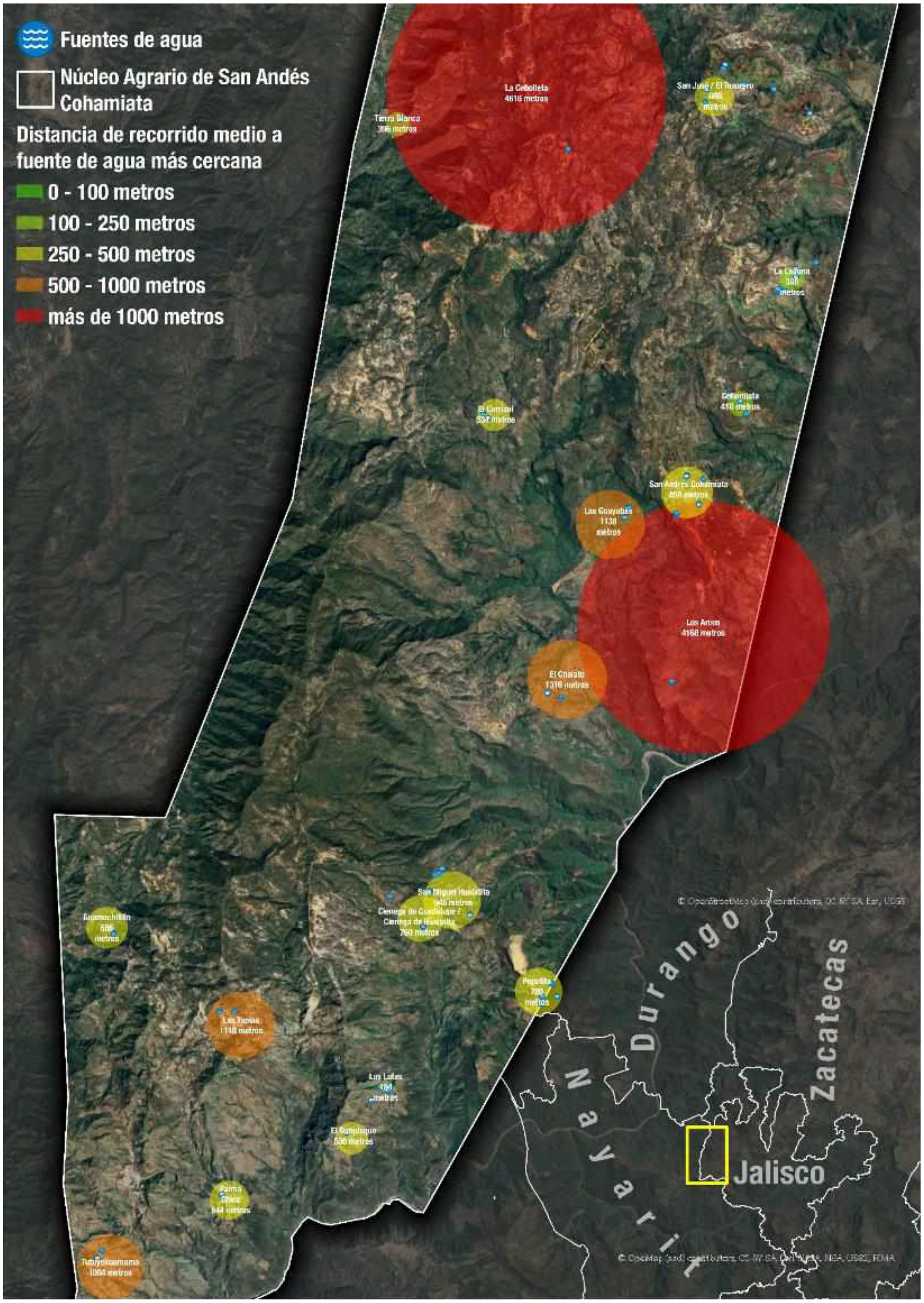
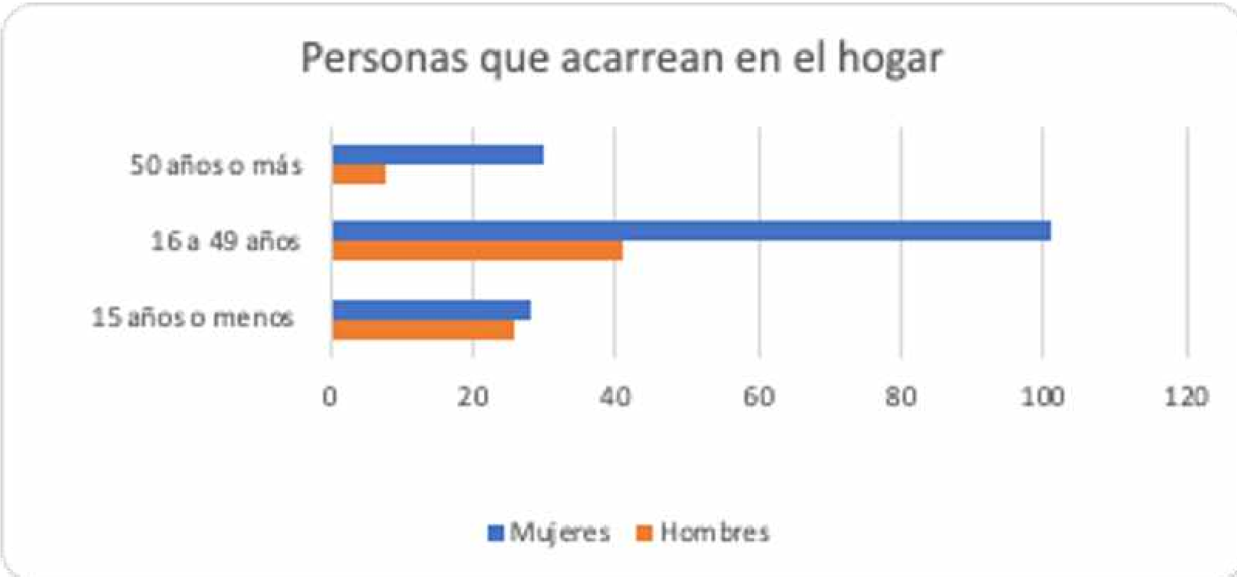
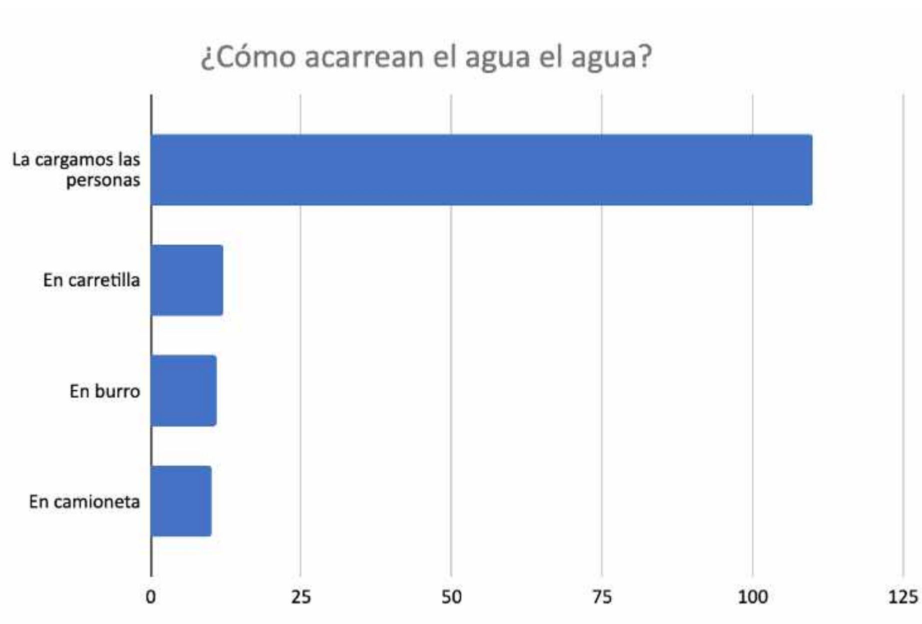


Figura 3: Distancia de recorrido medio a la fuente de agua más cercana. *Este mapa muestra el recorrido promedio de todas las viviendas, de ida y vuelta, al punto de abastecimiento de agua más cercano para cada localidad. El radio de cada círculo representa la distancia.*

El 68% de las personas que acarrean agua son mujeres y el 23% son niñas y niños menores de 16 años. Hacen un recorrido promedio de 1,104 m (mediana de 770 m, moda: 856 m) para llevar agua a sus hogares desde la fuente de agua más cercana (*Véase la figura 3*). Este trabajo les toma, en promedio, dos horas al día (González-Padrón 2019b).



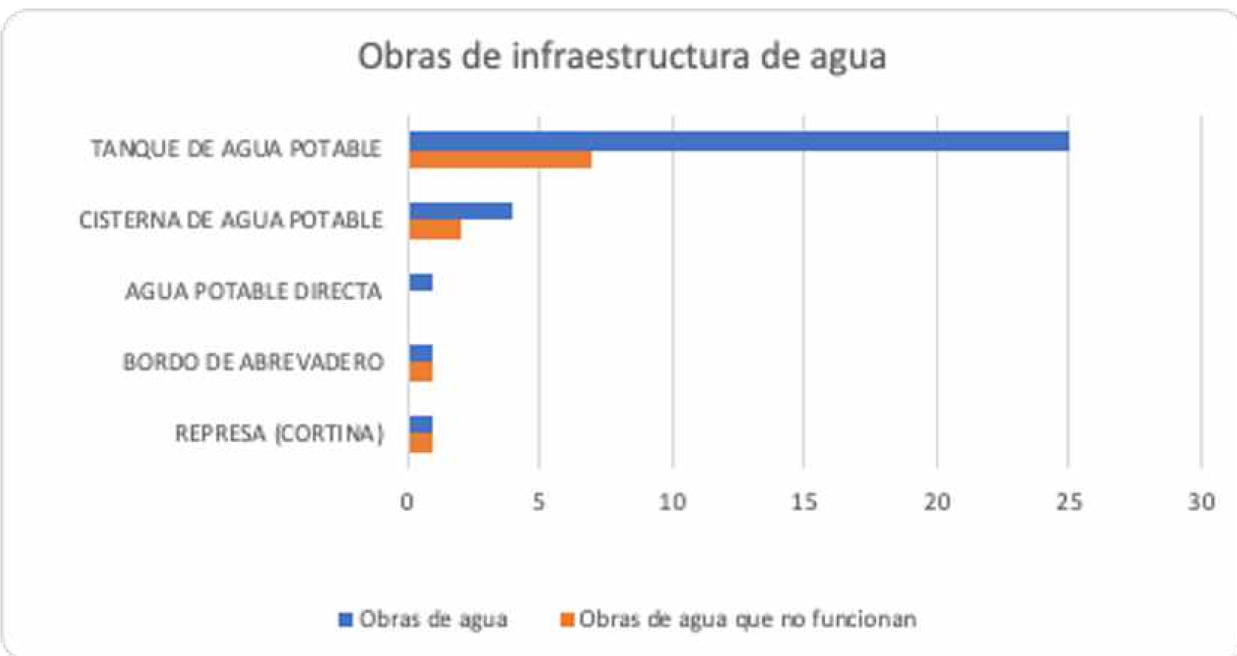
La mayoría del acarreo (77%) se realiza cargando a espalda, en garrafas de 20 litros, aunque las niñas y los niños acarrean en recipientes de 10 o 5 litros. Algunos hogares tienen la posibilidad de usar carretilla o burro. Sólo el 7% del acarreo se realiza en grandes volúmenes, mediante camionetas. El 4% de los hogares paga a quienes tienen vehículos por este servicio de acarreo.



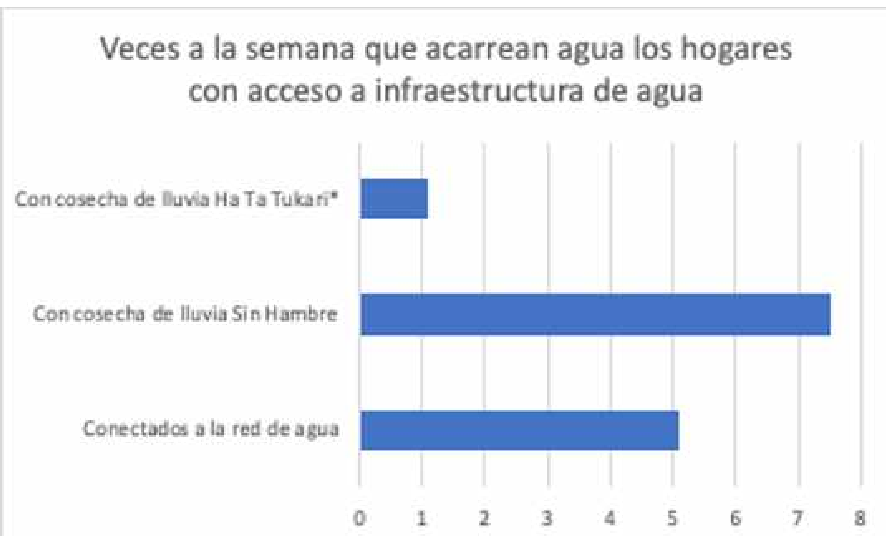
INFRAESTRUCTURA DE AGUA

La infraestructura de agua existente, es por lo general insuficiente e inapropiada para las características locales. La Comisión Nacional del Agua (CONAGUA) realizó estudios para

determinar la fuentes de agua con viabilidad para ser explotadas y el Gobierno Municipal de Mezquitic (mediante el PIS Wixárika), instaló sistemas centralizados para el abastecimiento de agua en el 76% de las localidades, a los que la población se refiere como "Agua potable", sin que esto signifique que el agua que distribuye sea potabilizada. En general, esta infraestructura centralizada se compone de un tanque de concreto, alimentado por algún manantial y una pequeña red de tuberías o mangueras que distribuye el agua por gravedad. El abasto por este medio es insuficiente. Algunos tanques tardan hasta 4 días en llenarse, alimentados por fuentes de agua con poca recarga. Instituciones como el DIF de Jalisco y el INPI han dotado a las localidades con mangueras para complementar estos sistemas, ya que en la mayoría de los casos, las tuberías no llegan hasta las localidades, pero estos componentes resultan muy vulnerables y suelen tener fugas. Por ejemplo, hay un sistema de manantiales cerca de Los Lobos desde el cual se abastecía agua a un grupo de localidades: Las Latas, El Tempizque, Popotita y Palma Chica. En los últimos años se quedaron sin esta fuente de agua, debido a que las mangueras se quemaron en incendios forestales.
Sólo el 56% de los hogares de SAC tiene acceso a esta infraestructura centralizada, que no abastece a las familias que viven dispersas en las rancherías, ni a los hogares ubicados lejos del centro de las distintas localidades. El agua de las tuberías suele llegar con muy poca presión y las llaves de distribución se abren en promedio 2.8 días a la semana. En algunas localidades, como en San Andrés Cohamiata que tienen los tanques de almacenamiento más grandes, el sistema se abre sólo durante la temporada de secas, para racionar el agua. Algunas comisarías cobran a las familias una pequeña cuota anual por el servicio.
Además de esta infraestructura para el acceso al agua, hay otros ejemplos de obras infuncionales o inadecuadas. Cerca de El Carrizal se construyó una represa que no distribuye el agua porque se descompuso la compuerta de la cortina. Hay bordos para ganado que no acumulan agua por estar mal ubicados, tanques y tinacos fracturados por su construcción deficiente, bombas eólicas que nunca funcionaron, y ollas de agua con geomembranas rotas. El 47% de las obras de infraestructura de agua no funciona en absoluto.



Podemos inferir que cuando se realizaron las obras, los responsables no procuraron que las localidades tuvieran los recursos, ni las capacidades para darles mantenimiento sostenido. No han aportado en el abasto de agua para las localidades. Prueba de ello es que el 55% de los hogares continúan acarreando agua de fuentes naturales en promedio 5.3 veces a la semana.
El programa federal Sin Hambre instaló sistemas de cosecha de lluvia en un gran porcentaje de los hogares de San Andrés Cohamiata y las Pitayas, pero estos no tienen un sistema de conducción, separación de primeras lluvias ni filtros. En consecuencia, la población reporta que se enlama el agua. La calidad del agua que almacenan es tan mala que no pueden aprovecharla para beber, cocinar o lavar platos, por lo que los hogares que cuentan con uno siguen acarreando un promedio de 7.5. veces a la semana. Esta situación contrasta con la disminución del acarreo registrada en los hogares en los que Ha Ta Tukari instaló sistemas de captación de agua de lluvia (SCALL) en La Cebolleta y La Laguna, donde la frecuencia de acarreo se redujo 88% llegando a un promedio de 1.1 veces a la semana (Ha Ta Tukari. Reporte de resultados 2015-2019). Las familias aún acuden a ojos de agua durante la época de lluvias (20%) y más del 40% durante la temporada de sequía, principalmente para lavar ropa y para bañarse. Estos resultados son adjudicados a un proceso muy cuidadoso de adecuación de la ecotecnología al contexto sociocultural wixárika, al acompañamiento cercano a las localidades para su adopción y a la construcción de capacidades locales.

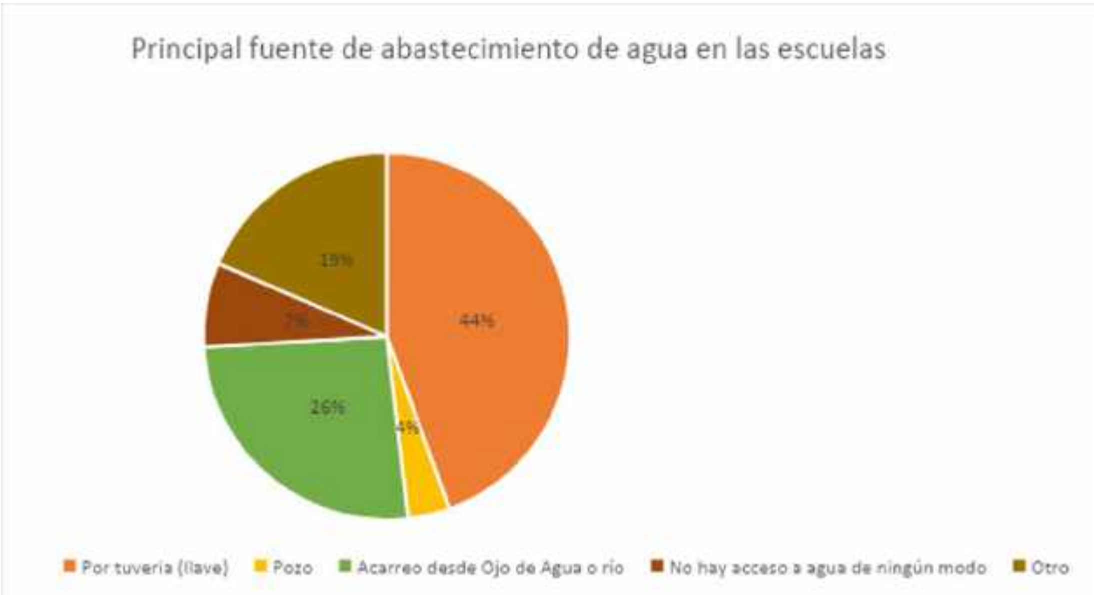


* Ha Ta Tukari. Reporte de resultados 2015-2019

La población siente que las autoridades no han atendido su necesidad de acceso al agua:

> "Han hecho solicitudes de proyectos para obtención del agua cada trienio del comisariado, desde que estaba Carrillo y se han cancelado."
> "No hacen caso al llamado del pueblo de ninguna forma."
> "Hicieron muchas solicitudes sobre el agua que nunca resultaron."

Infraestructura de agua en escuelas



El 44% de las escuelas reciben agua de un sistema centralizado como los que se describieron anteriormente. En el 26% de los casos, los padres y madres de familia se organizan para llevar agua por acarreo, mientras que el 7% de las escuelas no tiene acceso a agua en lo absoluto. La percepción de la dirección escolar, en el 71% de los casos, es que nunca tienen agua suficiente. El 14% solo tiene agua suficiente los días que se abren las llaves y sólo el 10% reporta tener el agua que necesitan.

NOTA: Para la opción "otro" tenemos las siguientes respuestas: los niños llevan su garrafón para su consumo; cosecha de lluvia instalada por otros y mediante mangueras.

Existe una gran cantidad de instalaciones para el manejo del agua presente en las escuelas, como bebederos, tanques y tinacos, etc. Pero la gran mayoría está en desuso porque nunca ha sido conectada a una red de agua. Ninguna de las escuelas tiene lavamanos funcionales.

CALIDAD DE AGUA

Las fuentes naturales de agua suelen ser de mala calidad por estar en espacios abiertos y con libre acceso a animales (González-Padrón, 2019b).
El Instituto Mexicano de Tecnología del Agua tomó muestras de fuentes naturales de agua que usa la comunidad para su consumo. Las muestras fueron analizadas primero en un laboratorio móvil, para analizar los parámetros bacteriológicos, y posteriormente enviadas al laboratorio de Calidad del Agua IMTA, en Morelos, para analizar la presencia de metales pesados. Para determinar si el agua de las fuentes de abastecimiento es apta para uso y consumo humano, se determinaron los parámetros microbiológicos Coliformes totales y E. coli. Los resultados obtenidos se evaluaron con el Límite Permisible establecido en la norma oficial mexicana NOM-127-SSA1-2021, que indica menor que 1.1 NMP/100 mL o no detectable, para el parámetro E. Coli.
Los resultados, indican claramente que, en términos bacteriológicos, la calidad del agua de las fuentes muestreadas no es aceptable. En términos de presencia de metales ningún punto representó riesgo para la salud de los habitantes de la zona. En todos los casos los valores se presentaron por debajo de los límites máximos permisibles

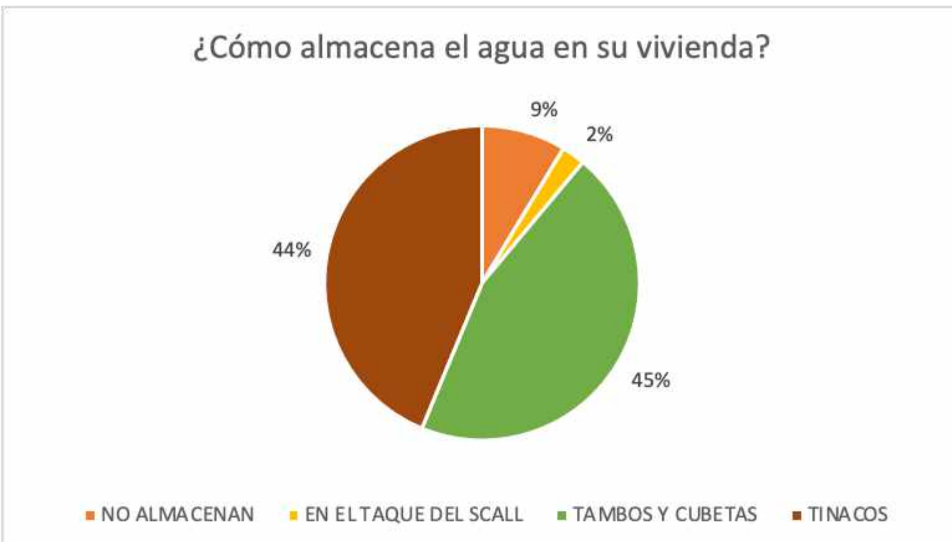
T**abla 10. Resultados de análisis de Coliformes totales y E. coli en fuente de agua natural**

Núm. De muestra	**Nombre del sitio**	**Coliformes Totales NMP/100 mL**	**Escherichia coli NMP/100 mL**	**CALIDAD**
1	San Andrés Cohamiata	22	10	NO ACEPTABLE
4	Haka Maka U	32	<1	ACEPTABLE
9	Taki + Kata	27	2	NO ACEPTABLE
10	¨Haka Maka U” San José	38	6	NO ACEPTABLE
13	El Papalote	40	<1	ACEPTABLE
16	Cabaña-Laboratorio	4	<1	ACEPTABLE
17	Los Arcos	83	43	NO ACEPTABLE
23	El Huizache	32	<1	ACEPTABLE
25	Palma Chica	<1	<1	ACEPTABLE
28	Las Tapias	154	<1	ACEPTABLE

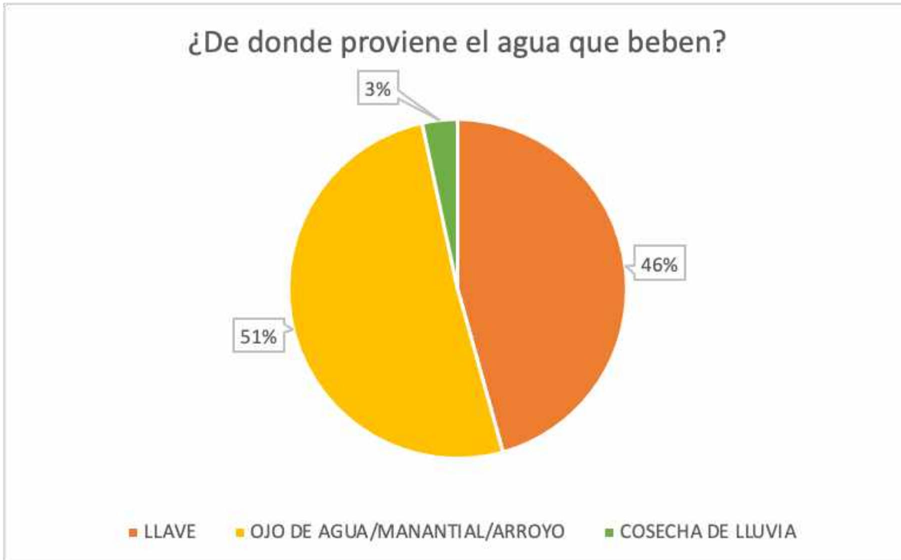
34	Guamuchilillo	<1	<1	ACEPTABLE
40	Cebolleta	1,986	2	NO ACEPTABLE
43	Cerro del niño	168	<1	ACEPTABLE
46	La Laguna	1414	2	NO ACEPTABLE

USO Y MANEJO DE AGUA

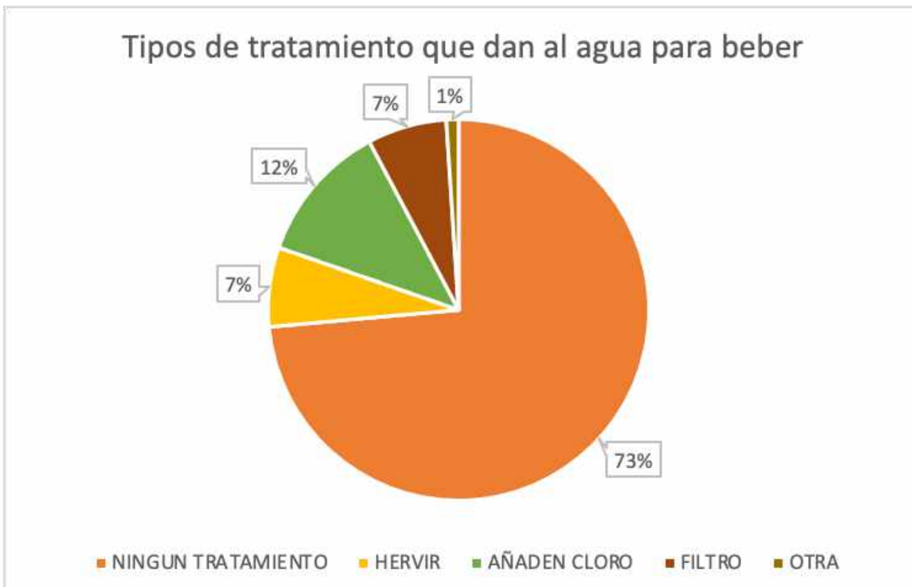
Los hogares almacenan el agua en tambos, cubetas y tinacos. Habitualmente, el agua para beber es colocada en una cubeta en la cocina y tomada de ahí con un vaso. Beben agua tanto de fuentes naturales, como de los sistemas centralizados.



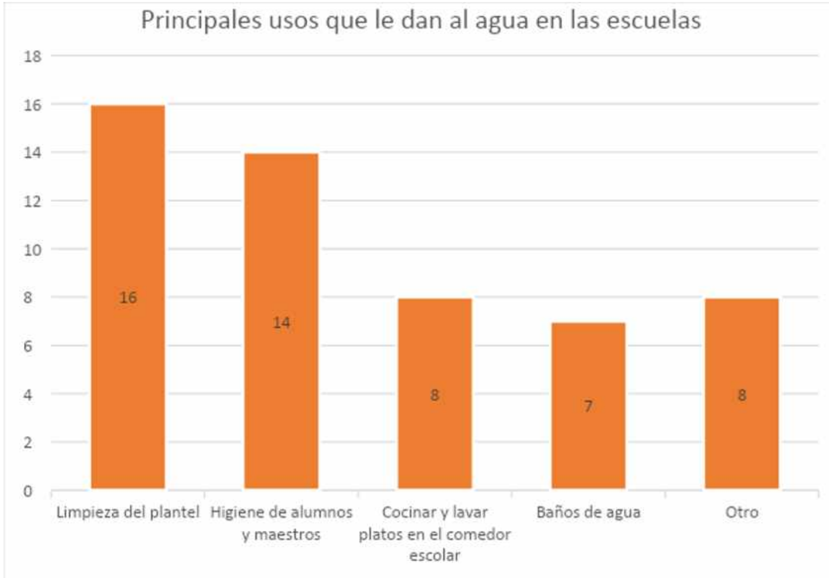
Nota: esta gráfica no incluye los SCALL instalados por Ha Ta Tukari en La Cebolleta y La Laguna.



Nota: esta gráfica no incluye los SCALL instalados por Ha Ta Tukari en La Cebolleta y La Laguna.



Nota. Los casos que respondieron “otra”, usan un colador de tela para filtrar.

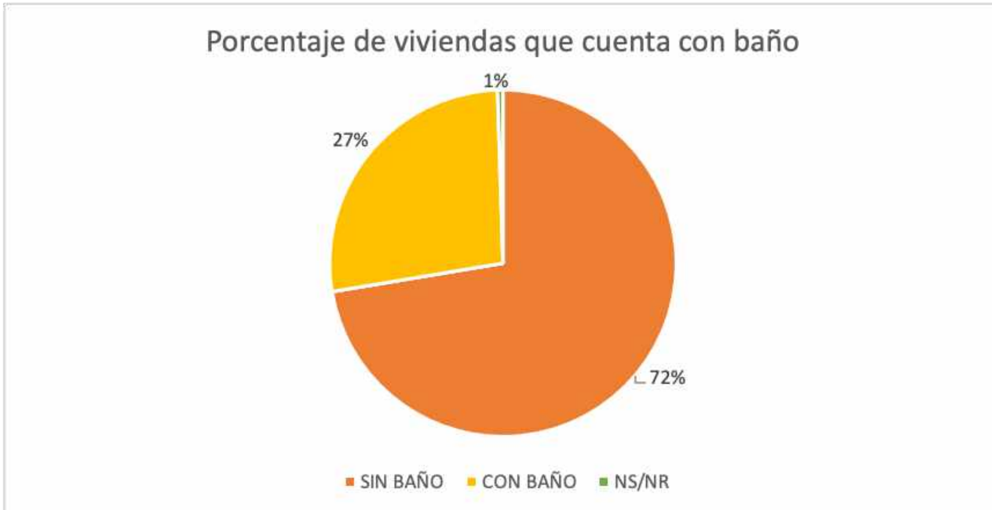


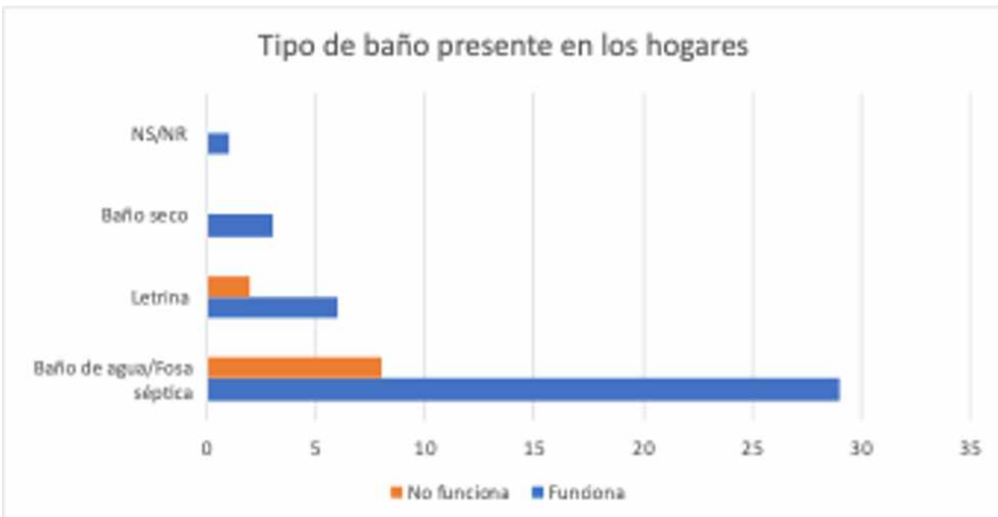
Nota. Para la opción “otro” tenemos las siguientes respuestas: beber y riego de plantas y hortalizas.

En las escuelas el agua se utiliza principalmente en la limpieza del plantel y en el aseo de niñas y niños. En menor medida, en el comedor escolar, la descarga de baños. En algunas escuelas se usa también para beber y para el riego de plantas y hortalizas.
Existe la percepción general en las localidades de que en los últimos años se ha reducido el agua de las fuentes naturales. Para más detalles, véase la sección VI. Cambio climático y otros riesgos, de este documento.

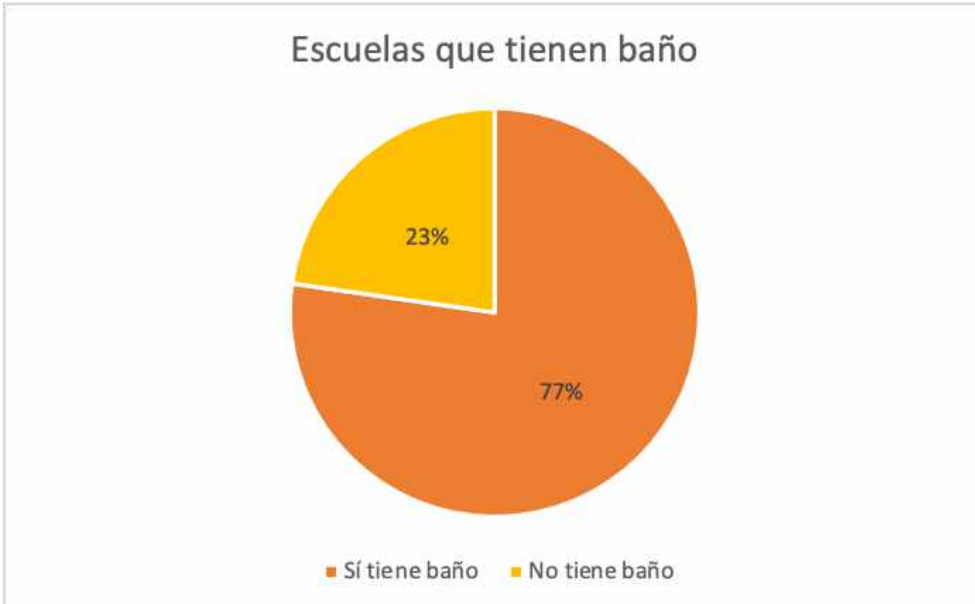
SANEAMIENTO

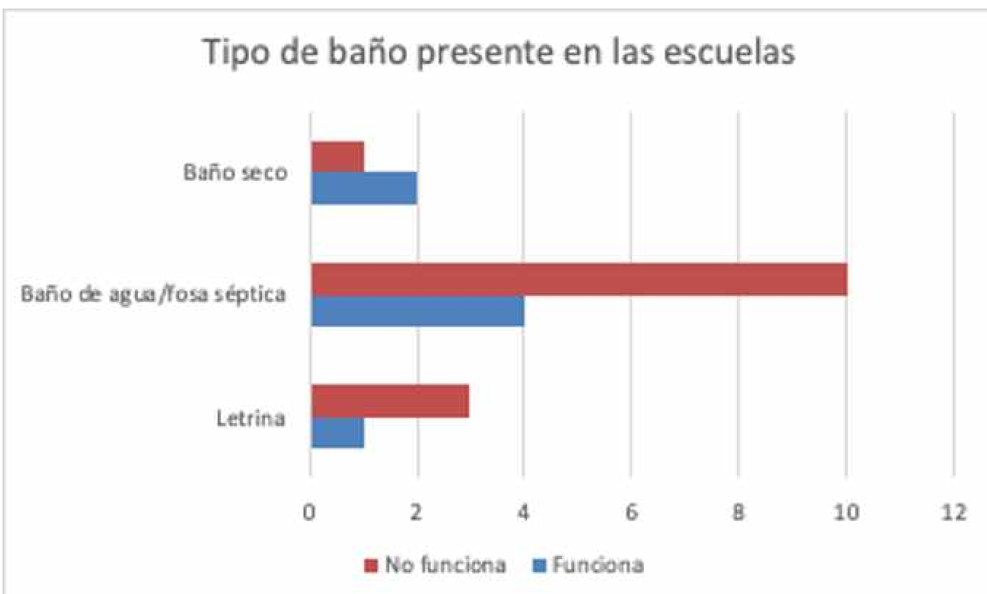
Sólo hay dos sistemas de drenaje en el núcleo agrario, uno que abarca las localidades de San Andrés Cohamiata y la Pitayas y otro que abarca San Miguel Huaixtita y su ranchería Tierra Blanca de Huaixtita. En San Andrés Cohamiata el drenaje conduce a una planta de tratamiento que no funciona correctamente. Las aguas negras se desbordan sin ser tratadas y terminan regresando a las fuentes de agua naturales donde se abastece de agua la localidad.
Sólo el 27% de los hogares tiene algún tipo de baño. El 16% tiene letrina con fosa séptica y sólo el 6% utiliza baños secos.
El 75% de los baños tienen taza de baño (baño de agua), la mayoría conectado a un pequeño biodigestor, a una fosa séptica. El 20% de los baños se encuentra en desuso, en general “por falta de agua”. El 72% de los hogares declaró practicar la defecación al ras del suelo de manera cotidiana.





El 77% de las escuelas tiene algún tipo de baño, pero el 71% no funciona. La mayoría de los baños en las escuelas son baños de agua (70%) que no se usan por falta de agua. En la mitad de los casos, estos están conectados a un drenaje que va a dar a una barranca o arroyo. 20% de las escuelas tiene letrinas. Sólo el 0% cuenta con un baño seco. En el 13% de las escuelas se observaron heces al ras del suelo dentro del plantel.



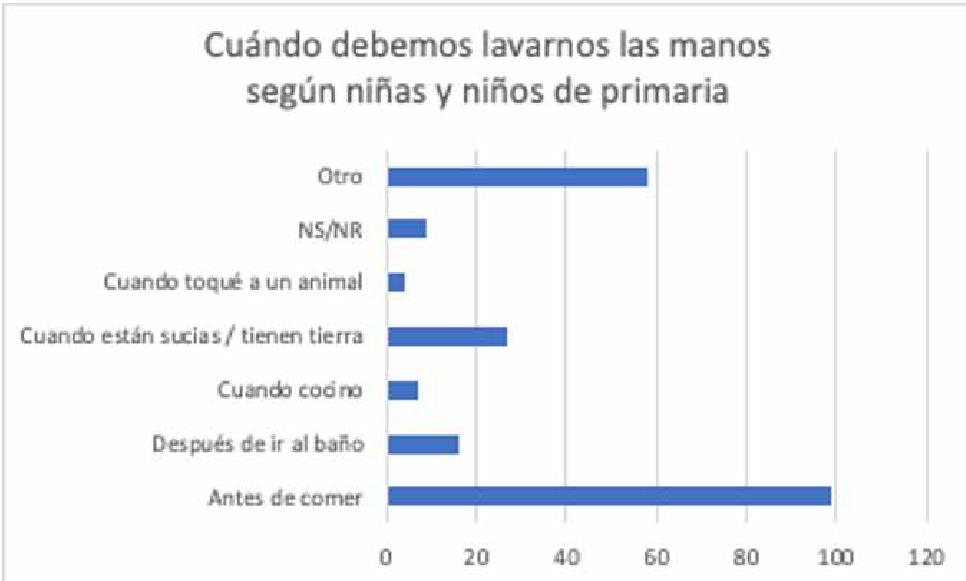


V. PRÁCTICAS DE HIGIENE

En más del 96% de los hogares se practica el lavado de manos antes de comer o cocinar y en el 85% se hace después de ir al baño, sin embargo 54% de los hogares no usa jabón para esta práctica. Las personas se bañan en promedio 3 veces a la semana.

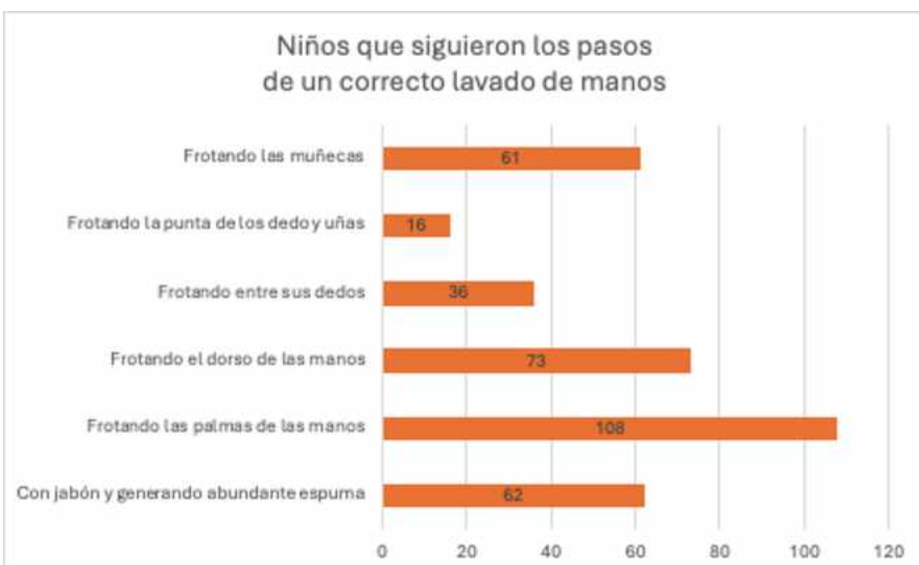
PRÁCTICAS DE HIGIENE EN ESCUELAS

En el 63% de las escuelas los niños se lavan las manos en cubetas en el suelo y en el 22% no se lavan las manos en lo absoluto. No hay ninguna escuela con lavamanos funcionales. Esta situación dificulta enormemente la adopción de prácticas de higiene en las escuelas.



Nota. Para la opción otro tuvimos las siguientes respuestas: tres veces al día, al levantarme, al llegar a la escuela y en el receso.

El 38% de los niños asocian el lavado de manos a momentos del día (al levantarme, tres veces al día, al llegar a la escuela), en lugar de relacionarlo con las actividades en las que pueden adquirir y consumir patógenos. El 66.4% de los niños evaluados sabe que es necesario lavar sus manos antes de comer. Sólo el 10.7% considera que debe lavarlas después de ir al baño.



Se realizó en las escuelas la evaluación de la técnica de lavado de manos promovida ampliamente por la OMS durante la pandemia de COVID 19. Los niños obtuvieron en promedio 3 puntos en una escala de 0 a 7.
La mayoría de los docentes entrevistados percibe que las prácticas de higiene de sus estudiantes son deficientes, debido principalmente a la falta de agua:

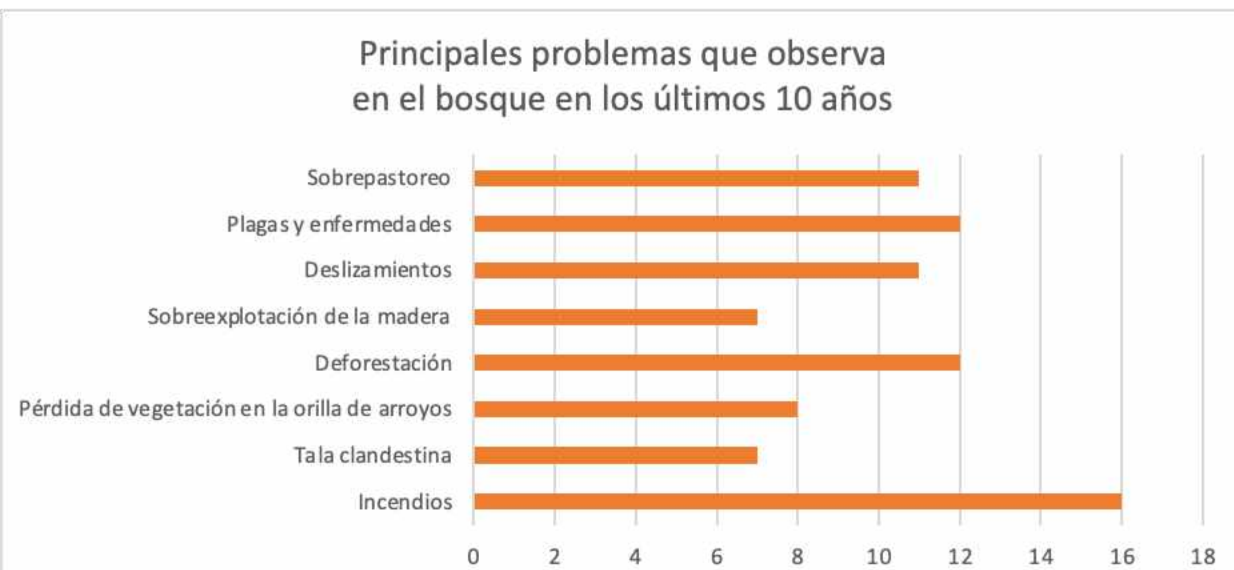
"Muy deficiente. Hace falta mucho la higiene y saneamiento hacia las niñas y los niños por la falta de agua."
"Deficiente, hacen falta pláticas para llevar a cabo la higiene personal."
"Muy baja, se requiere mucha atención desde su hogar, les hace falta mucha agua para su higiene."
"A veces sí vienen lavado su ropa, su cara, manos. Esto se debe a cuestiones de falta de agua. No tienen agua, hasta han llegado a faltar a la escuela."
"Se les es complicado, porque la familia carece de materiales como jabón y una de las necesidades más grandes es el agua."

VI. CAMBIO CLIMÁTICO Y OTROS RIESGOS

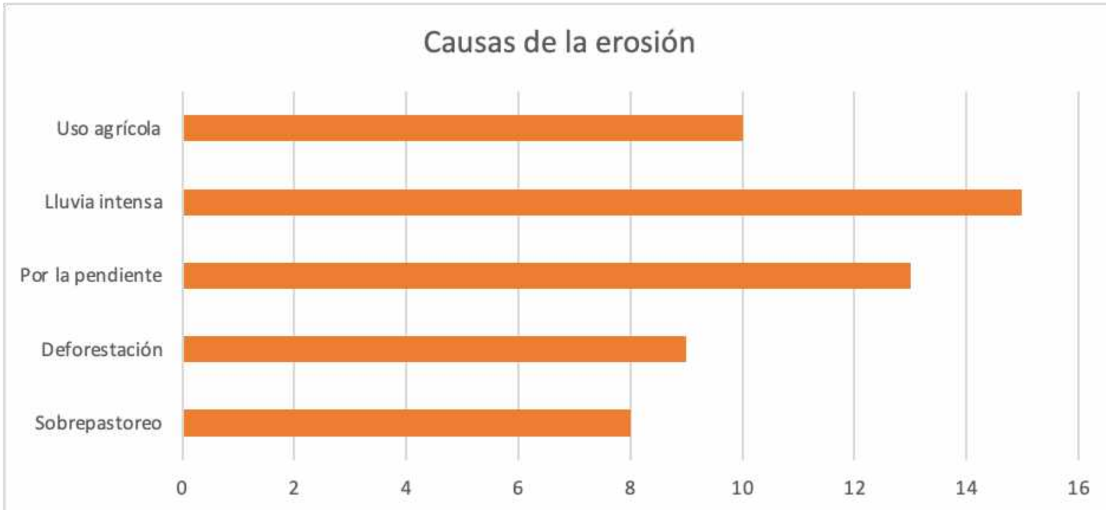
PROBLEMAS DEL BOSQUE

Las autoridades en las comisarías señalan que los principales problemas que han afectado al bosque en la última década, son los incendios forestales (94%), seguidos de plagas, deforestación, sobrepastoreo y deslizamientos. La mayoría de las autoridades adjudican estos problemas a que no se respetan los reglamentos comunitarios (70%) y a la falta de organización comunitaria:

"Está creciendo la población ya no hay organización"
(Ficha de la localidad).

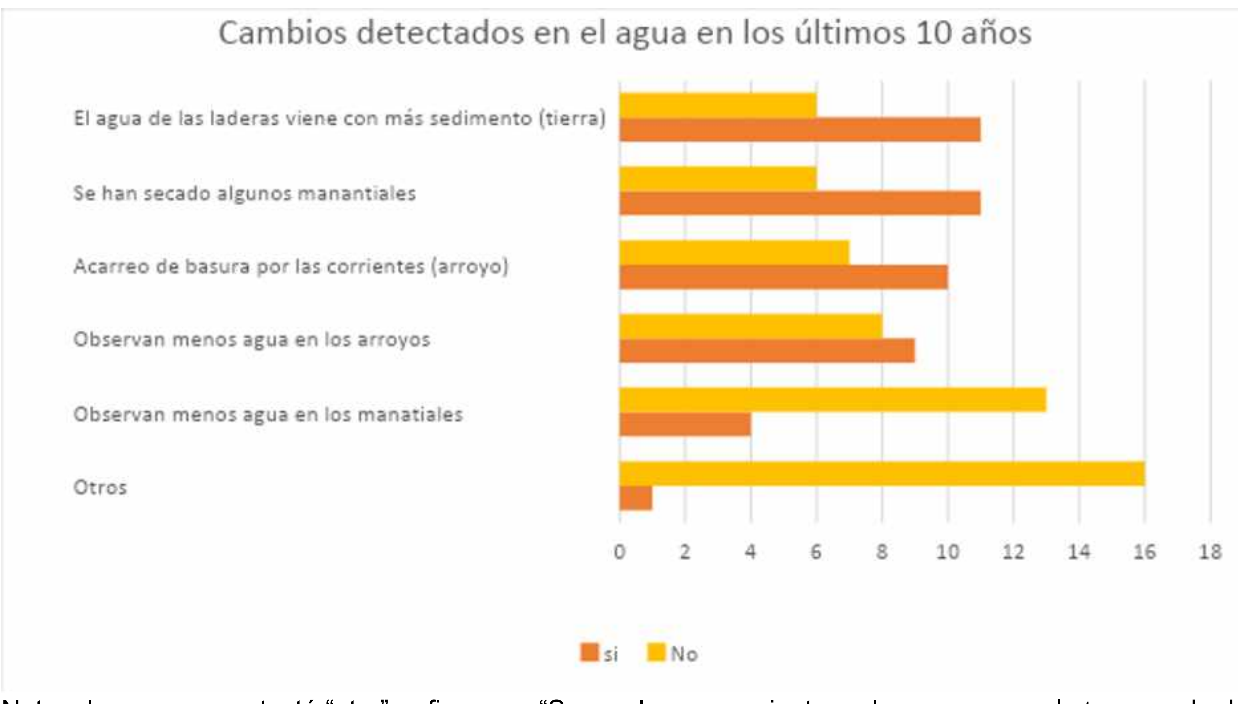


El 100% de las localidades han observado erosión (áreas sin vegetación y pérdida de suelo en las laderas y el bosque), que adjudican principalmente a las lluvias intensas (88%), a la pendiente (76%) y al uso agrícola de los suelos.



PROBLEMAS DEL AGUA

El 100% de las localidades detecta cambios en el agua que viene de las laderas en los últimos 10 años, los más comunes son la desecación de manantiales y el aumento de sedimento en el agua que baja de las laderas.



Nota: el caso que contestó “otro”, refiere que “Se ve el agua creciente en los arroyos, en la temporada de lluvia”.

La temporada de lluvias es de julio a septiembre. Los pobladores reportan que antes iniciaba en el mes de mayo, pero se ha vuelto más corta con el cambio climático, de modo que muchos ojos de agua reducen su volumen significativamente o se secan a partir de mayo. En las últimas décadas ha disminuido la recarga de las fuentes naturales y ha aumentado la población, por lo que el agua ya no alcanza para todos:

> “No había sequía en esos tiempos y era poca la población. Desde hace 10 años es cuando comenzó a cambiar todo.”
> "Es una desesperación estar esperando turno para tomar agua y llevarla a casa. Una frustración por no levantarse temprano y no alcanzar lo suficiente."
> “Algunos ojos de agua ya se secaron.”
> “Algunas personas se fueron de esta localidad por falta y necesidad de agua.”
> “Había arroyos con mucha agua, alcanzaba para todos y hasta sobraba.”
> “Cada vez se aumentan los habitantes y por el uso se han secado los ríos.”
> “Antes no había mucho ganado, no lo consumían tanto.”
> “Había mucha agua en los ojos de agua. No estaba muy habitada la comunidad. Existía mucha vegetación, sobre todo en los ojos de agua. Estaba lleno de carrizo.”
> “El pueblo se originó en San Juan de popotita, poco a poco se fueron distribuyendo a otros lugares, siguiendo rutas del agua. El agua era suficiente, pero se fue acabando.”

El 35% de las localidades reporta tener conflictos por el agua entre familias, entre localidades e incluso con comunidades de Nayarit:

> “Tienen problemas por el agua, algunos desconectan las mangueras, se las quedan y las destinan a los que les caen bien.”
> “Sí tienen conflictos, por la desesperación de estar en turno. Hay muchos conflictos entre familias por el agua”.
> “Existen conflictos por el tema del agua, cerrando los pasos de agua.”

PRODUCCIÓN AGRÍCOLA

En el 94% de las localidades han notado una disminución de la producción agrícola que adjudican principalmente al empobrecimiento del suelo, la erosión, las sequías y las plagas. También sufren por el robo de ganado.

> “Las plagas, la clima es frío y la vegetación no produce mucha materia orgánica que no crece bien la siembra.”
> “Enfermedades de los animales y por la sequía, por el cultivo no rotativo ni descanso del suelo.”
> “Por falta de agua, por uso de herbicidas en las parcelas.”
> “Por plagas, por enfermedad, incendio y sequías.”

El 88% no realiza ninguna práctica para evitar la pérdida de suelo en el coamil, solo una minoría coloca costales de tierra y barreras de piedra. Reportan poco uso de fertilizantes, sólo el 5% aplica estiércol de ganado al coamil y el 29.4% usa fertilizantes químicos. Sin embargo el 70.5% utiliza plaguicidas químicos. Entre los problemas que identifican para la producción agrícola están la pérdida de suelo fértil, la falta de agua, las plagas y la falta de tiempo para dedicar a la labor.

> “El ganado, por enfermedad y en la producción, por plagas en el sembradío”.
> “Pérdida de suelo fértil por el uso de herbicidas.”
> “Pérdida de malezas y suelo. Crece otro tipo de zacate que no es comestible para el ganado.”
> “Por falta de tiempo para laborar.”
> “Por falta de agua las hortalizas no están funcionando y falta de semillas para sembrar.”
> “No hay práctica para la conservación del suelo.”

“Depende mucho de la lluvia, a veces cuando llueve bien obtenemos buena cosecha.”

VII. ORGANIZACIÓN Y PARTICIPACIÓN

A pesar de que existe una identidad étnica entre las cinco comunidades wixaritari, no comparten ningún tipo de gobierno y son políticamente independientes. Incluso existen añejos conflictos territoriales entre comunidades.

La Asamblea Comunal de Tateikie (San Andrés Cohamiata) es la máxima autoridad del Núcleo Agrario y está conformada por las 21 comisarías. Dentro de la organización comunitaria hay diversos cargos de gobierno tradicional y civil. El órgano responsable de los temas agrarios es el Comisariado de Bienes Comunales, conformado por un Presidente, Secretario, Tesorero y sus suplentes. Existe un Comité Comunitario de Agua Potable y cada comisaría tiene un Comité Local de Agua Potable. Estos son los responsables del manejo y mantenimiento básico de los sistemas centralizados de agua (Comisaría de Bienes Comunales Tateikie, 2020).

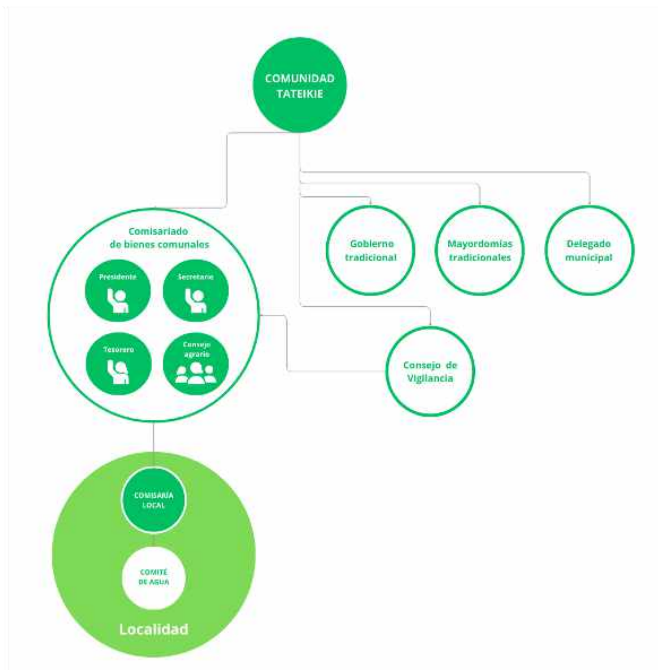


Figura 4. Organización comunitaria

Por otra parte, existe una Empresa Comunal de Producción de Servicios, de reciente creación, que integra el aprovechamiento forestal, aprovechamiento de agave y producción de servicios comunales (transporte, ecoturismo y pequeña industria). Entre sus funciones está la protección forestal mediante el combate de incendios y plagas.

La comunidad wixarika de Tateikie, San Andrés Cohamiata elaboró el *Protocolo Comunitario Biocultural*, 2020. Este es un instrumento de gestión para regular los mecanismos de solicitud de acceso, de negociación y de reparto justo y equitativo de beneficios derivados de los recursos biológicos, genéticos y el conocimiento tradicional asociado, presentes en su territorio. El programa Ha Ta Tukari fue presentado ante la Asamblea Comunal para su aprobación, alineándose a dicho protocolo.

APRENDIZAJES

Generar y acopiar la información presentada en este informe requirió un proceso complejo de desarrollo de capacidades del equipo intercultural. A pesar de que fue un gran reto, se obtuvo información basal suficiente, cuantitativa y cualitativa para verificar en el futuro cambios en el acceso al agua, así como en las prácticas de higiene y saneamiento de la comunidad. En el futuro, fortaleceremos la capacitación del equipo intercultural para registro de información y técnicas de acopio.

Se logró el objetivo de comprender a profundidad la situación del agua en San Andrés, sin embargo, hay algunas áreas de oportunidad en las que es necesario trabajar para consolidar la mejor información posible. Si bien, en el diseño de muestras se propuso entrevistar alrededor del 10% de los hogares por cada localidad, hubo localidades donde no se alcanzó la muestra deseada y otras donde se excedió. Se propone darle continuidad al proceso y fortalecer la muestra en aquellas localidades donde la muestra fue muy baja.

Por otra parte, no se logró obtener información suficiente y consistente sobre el tema de salud, un tema que siempre es sensible para los beneficiarios. Para subsanar estas lagunas en la información, trabajaremos en el diseño de instrumentos participativos más adecuados para entender cómo percibe la comunidad wixárika su situación de salud. También se procurarán alianzas con las instancias sanitarias regionales para solicitar datos precisos a nivel local, considerando que esta información es fundamental para verificar los impactos en la salud comunitaria de un mejor acceso al agua.

El proceso de diagnóstico comunitario resultó en aprendizajes que permitirán elaborar instrumentos más precisos y simplificados para aplicarse en la escala del programa Ha Ta Tukari a nuevas comunidades agrarias.

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ANNEX 12
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