



Tacaná Watersheds Guatemala & Mexico

Transboundary water governance and implementation
of IWRM through local community action



IUCN WATER PROGRAMME – DEMONSTRATION CASE STUDY NO.5

WATER AND NATURE INITIATIVE (WANI) CASE STUDY

TACANÁ WATERSHEDS: GUATEMALA & MEXICO

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Beginning with a grassroots approach to water management, increased knowledge and information and the improvement of environmental health and livelihoods, the region around the Tacaná volcano on the border of Guatemala and Mexico has shown the way forward in scaling up local level approaches to national level initiatives.

WANI and partners set up a demonstration project in the Tacaná Watersheds, which combined pilot livelihoods projects and bottom-up integrated governance of water resources management. Raising awareness and disseminating information about water resources management were major goals for WANI. Numerous community pilot projects to improve livelihoods through water, soil and environmental conservation were carried out. These were also part of the mechanism to bring stakeholders together to organize themselves into Microwatershed councils. Additionally, when Tropical Storm Stan struck the area in 2005, activities to restore water supplies were carried out by WANI in this part of Guatemala.

Many lessons have been identified from WANI's work in the Tacaná Watersheds. Among these is the understanding that developing local governance and organisational structures benefit and complement IWRM actions. Integrating local communities and their social structures into Microwatershed councils leads to greater cohesion and unity. Additionally, that strengthening community-based alliances and integrating them with municipal and national development institutions increases coordination between administrative levels. Finally, developing disaster risk management planning should be integral to the overall watershed management planning and not just as an emergency response (as demonstrated by Tropical Storm Stan).

The WANI Tacaná Watersheds demonstration project has built a platform for wider influencing of regional and national water management. The promotion of integrated water resources management and resilience at the local, national and regional level has continued with other projects which mostly focus on governance through Microwatershed councils and building resilience through water management. The continued livelihoods work is also a strong component in these complementing projects.

Highlights

- Combined community livelihoods pilots and bottom-up coordination of water resources management to tackle problems of watershed degradation and management.
- Facilitated the collection and organization of locally available information and knowledge.
- Organised and developed micro watershed councils.
- Rehabilitation and disaster risk reduction support after Tropical Storm Stan.
- Developed alliances and integration of local to national levels including national Watershed Commissions to develop integrated approach to water management.

1. INSTITUTIONAL CHALLENGES AND ENVIRONMENTAL DEGRADATION

1.1 Resources on which livelihoods depend

The watersheds of the Tacaná volcano, which stands at an altitude of 4,093 m, cover a transboundary area of 3,170 km² right in the middle of the border area of the Department of San Marcos, Guatemala and the State of Chiapas, Mexico. This area comprises the Coatán, Suchiate, Cosalapa and Cahoacán rivers. The Coatán and Suchiate watersheds originate on the volcano, with both shared by Guatemala and Mexico. Cahoacán and Cosalapa are sub-watersheds of the Coatán River, within Mexico.

These watersheds are of great strategic importance for both countries since they supply water to a large number of residents in the cities located downstream and are the main source of irrigation water for agriculture. In the lower reaches, fishing is an important source of income.

However, deforestation and degradation of the upper watersheds and of river banks has led to erosion and flooding and reduced capacity of the watersheds to absorb water.

1.2 Pressures on water resources

Water is primarily used for domestic purposes and small-scale irrigation in Guatemala, while in Mexico, 54% of surface water is used for irrigation, 26% for human consumption and 10% for agribusiness. Coffee production and export plays an essential part in the livelihoods strategies of communities. In the middle and lower parts of the catchment, water scarcity in the dry season is problematic for agricultural production, affecting community income generation as coffee production depends on water for processing coffee beans.

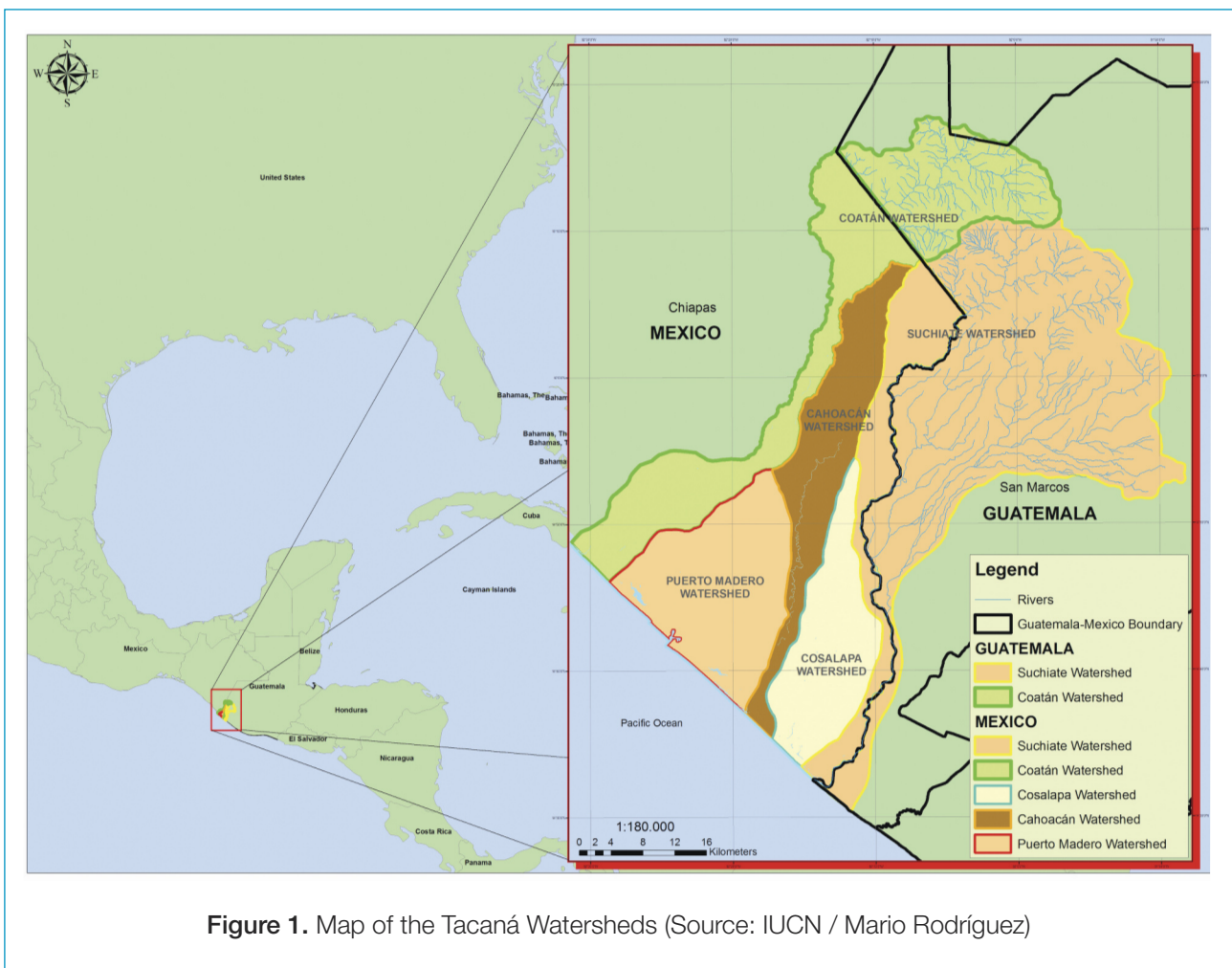


Figure 1. Map of the Tacaná Watersheds (Source: IUCN / Mario Rodríguez)



In the Tacaná Watersheds

1.3 Environmental degradation: deforestation and pollution

Marginalised farmers have been forced to higher altitudes on the volcano and have cleared forests to make way for small farms. In the low and middle parts of the catchment, sugarcane, coffee, African palm and banana industries pollute the water and larger-scale farming has degraded the land. Unregulated land use change has been especially damaging on steep hillsides and deforestation has reduced the capacity of the soils to retain water. The resulting erosion has strongly increased the risk of floods and mudslides.

1.4 Weak institutions and social challenges

Governmental authority is dispersed with little connection between local and national levels. This has led to weak institutional presence, inadequate

laws and regulations, budgetary constraints, lack of technical coordination and mutual support among institutions, the absence of integrated policies, and limited stakeholder participation and transparency. Historically, there has been no coordination of basin management between Mexico and Guatemala for the Coatán and Suchiate rivers. However, in Mexico, the new water law states that local Water Councils are responsible for implementation of the law and policies on water resources. However, while the conceptual framework was in place, the Water Councils lacked the capacity to carry out these activities. Furthermore, in parts of the basin the marginalization of indigenous peoples, high illiteracy and mortality rates, very high population growth, and a complex land tenure rights system are also major challenges.

2. TOWARDS SOLUTIONS: ACTIONS AND RESULTS

2.1 Overview

As a response, WANI and partners set up a demonstration project in the Tacaná Watersheds which combined pilot projects to improve livelihoods with bottom-up integrated governance of water resource management. There were numerous community pilot projects to improve livelihoods through environmental conservation projects. These initiatives also contributed to a culture of self organization which facilitated the development of Microwatershed Councils.

2.2 Ecosystems and livelihoods

Water, soil and environmental conservation

WANI and partners supported the design of numerous community pilot projects which addressed water, soil and environmental conservation. Eighty six pilot projects were carried out by community groups in Guatemala and 21 in Mexico (see Box 1). Women make up 90% of these groups, empowering them to take a more proactive role in the development of their communities which was formerly the exclusive domain of men. Through an ecosystems approach, which focuses on environmental restoration for livelihood security, these small scale initiatives have energised the communities to self-organise and has enhanced their development opportunities.

Tropical Storm Stan: a lesson in preparing for natural disaster

The value and benefits of increased coordination of watershed management and development was clearly demonstrated in the aftermath of Tropical Storm Stan, which struck San Marcos and Chiapas in October 2005 (see Box 2). This storm destroyed infrastructure and caused catastrophic flooding, leaving many homeless and many fatalities in its wake. With a network stretching across the region and connecting local community organizations, municipal governments and national ministries, the Tacaná project reacted quickly and was instrumental in mobilizing responses.

2.3 Knowledge

Economic valuations: Payments for Environmental Services

The Living Water Partnership is composed of six associations that seek to implement revenue mechanisms to feed an environmental fund dedicated solely to conservation work in the Tacaná watersheds. Through conservation projects in the middle and upper watersheds, it seeks to protect and restore the area's water resources. Through this Partnership, a payment for ecosystem services process was established in 2008 in the municipality of San Pablo, Guatemala called FOGESHIP (for "Fondo de

Box 1. Interventions carried out as part of the livelihoods and environmental conservation projects

- 18 forestry and soil conservation demonstrations and 122 management plans for conservation of community forests;
- 10 pilot projects in Chiapas facilitating development and networking of community enterprises and cooperatives working, including beekeeping, fish farming and butterfly farm ecotourism;
- Community gardens, organic farming and soil conservation projects, including organic fertilizer production at composting centres;
- Construction of septic systems to improve sanitation and water quality in the Suchiate River;
- Protection of springs for domestic water supply and installation of piped distribution;
- The establishment of a demonstration and training centre in Chiapas for integrated management of watersheds;
- Supported the building of a water treatment plant and advised on how water can be recycled in the processing of the coffee beans to reduce wastewater;
- Production of eatable mushrooms has contributed to improve food security and livelihoods.

Box 2. The rehabilitation, reconstruction and redesign of drinking water systems damaged by Tropical Storm Stan in San Marcos, Guatemala

The Tacaná project facilitated communications, damage assessment and the organization of donor coordination in the immediate aftermath of the disaster. In conjunction with municipalities and governmental authorities, a reconstruction plan for the Department of San Marcos was developed. WANI coordinated the rehabilitation and reconstruction of 72 drinking water systems and 4 small irrigation systems. A total of 77 communities with approximately 34,092 inhabitants comprising 6,616 families took part in water supply systems studies.

Disaster preparedness plans and mechanisms were also developed alongside the reconstruction work. The crisis alerted the authorities and communities about climate change impacts and the need to increase resilience to tropical storms and flooding through improved infrastructure and restored ecosystems. This crisis was therefore instrumental in galvanizing commitments to integrated water resources management and water governance reforms.

Gestión Hídrica Participativa”), to protect and restore the area’s natural resources, especially water resources. As well as a demonstration project named “Water for the Future” (Agua para el Futuro) in the Tacaná town.

To date, outcomes of the work include systematization of national information on payment for ecosystem services, the preparation of a glossary of payment for ecosystem services terminology, and training for technicians in the theme. Having gone through a process of confirming its legal status in 2011, FOGESHIP is ready to begin implementation as a water fund. The scheme will be financed through an adjustment in water rates charged in urban areas, with the support of the municipal utilities. In addition, a training course on payment for ecosystem services was developed during 2010 and it is now available online through the website link: www.confluenciasagua.net.

Locally available information and knowledge

WANI facilitated grassroots mobilization further in Mexico through the establishment of the ‘virtual water resource libraries’ in the town halls of five municipalities. These provided access to up-to-date information and knowledge on water



Aftermath of Tropical Storm Stan

resources and the environment in the region. The libraries are used in awareness raising, educational programmes for 10,000 youngsters annually and, importantly, as a means of increasing political openness over water at the municipal and State levels. There is also a website containing a digital library, bulletins, photo galleries, videos on experiences, powerpoint presentations, stories, documents and events announcements (www.confluenciasagua.net).

Learning and leadership through increased knowledge

Learning from the pilot projects under WANI has been incorporated into the University of San Carlos's academic studies through 10-month internships. These programmes are creating a critical mass of professionals trained in WANI concepts, approaches and practice who will eventually go into professional positions in different institutions and organizations active in the area, creating an influential feedback loop. At the national level in Guatemala, Guidelines for the Development of Micro Watershed Management Plans have been developed and published. This guide has been promoted by the

began as a Catholic environmental education initiative run by a group of young volunteers promoting sustainable water use and watershed restoration. This initiative has since grown into an entrepreneurial enterprise supporting income generations and governance approaches.

Microwatershed Councils

Change in water governance in Tacaná was mobilized through supporting the organization and development of Microwatershed councils. In Guatemala, microwatershed councils encompass 10 to 20 communities who share water resources in the watersheds of tributary streams. The councils are organized to coordinate resource

management of shared water and land resources and, critically, how this can be integrated with community development. The initiative for setting up Microwatershed plans is essential because a strategic area is defined for implementing actions that other nearby communities or microwatersheds can replicate. Microwatershed management plans are the instrument through which communities recognise, prioritise, and plan projects for sustainable use of water resources in the areas where they live. In this way, these plans also help to improve local water governance.

Fourteen Microwatershed

councils were formed in Guatemala and nine Committees in Mexico, comprising local governments and communities living within the Tacaná Watersheds. For example, in the mid-section of the Suchiate River, the process incorporated small coffee producers with whom projects have been planned to reduce water use at coffee-processing facilities and to improve organic plantations. The Councils were recognized by local governments from the start as town mayors participated in the organizational process. The Microwatershed councils in Guatemala join each other together and therefore expand their actions to include watershed management at different scales. In Mexico, at least two of the Microwatershed committees are now responsible for the implementation of regulations under the new water law.



Community tends to a seedling nursery

National Micro Watershed Commission and integrated by the Ministry of Agriculture, Husbandry and Food (MAGA), Presidential Coordination Executive Secretary (Secretaría de Coordinación Ejecutiva de la Presidencia-SCEP), FAO and IUCN amongst others, in academic spheres and in political and technical institutions in Guatemala.

2.4 Self-organisation

Small business enterprise

In Guatemala, WANI was instrumental in supporting the emergence of a youth-run cooperative enterprise called 'Jóvenes en la Misión' (Youth in Mission, JEM). JEM (see Box 3)



Members of JEM, Jóvenes en la Misión, pose in front of project site

Box 3. Jóvenes en la Misión (Youth in Mission, JEM)

Presently, Jóvenes en la Misión (Youth in Mission, JEM) has 200 members actively involved within the municipality of San Marcos and a total of 2,000 youth working together on water issues in Guatemala. JEM's motto is 'United for Water' and most of its activities have an environmental component. JEM has been influential on local policy, as Feliciano Velásquez, president of Community Development Committee of San Pablo, Tacaná and member of the Esquichá Microwatershed Council explains, "...The provincial government took notice. Mayors took notice. That was important."

With assistance from the Tacaná Project, JEM became a registered NGO in July 2005. A year later, JEM received a loan which helped them to build 19 greenhouses with drip irrigation that produced flowers and vegetables such as tomatoes, peppers and cucumbers. Community economic development is fundamental to environmental conservation, noted Ottoniel Rivera, IUCN coordinator of the Tacaná project: "These kids don't want to migrate to the United States like so many others. They want to remain in their community, but they have to make a living. They want to protect the environment, but then they ask, 'So now that we've saved the forest, how are we going to make a living?'"

Today, JEM continues to campaign and advocate for water issues, helping to improve livelihoods through the use of appropriate technologies and support community development by building capacity for water governance. A Strategic Plan was developed to further guide its activities. Among its achievements of the last 5 years, JEM has supported reforestation to improve water supply which has helped more than 800 people in the Esquiche micro-watershed and has established a virtual platform for dialogue to strengthen projects along the borders of Guatemala and Mexico. JEM now has a strong national presence and is involved in a national youth movement participating in many activities related to climate change and water at both local and national levels.

Developing alliances and integration of local to national levels

Through WANI, the Tacaná project developed a water planning and community management model which focused on microwatersheds. The model is based on: 1) broad community participation and recognition of microwatersheds as planning unit, 2) the involvement of local political authorities in environmental management, 3) building community capacity in integrated water resource management, and 4) forging strategic alliances with government and nongovernmental organisations. This model is inclusive, highly participatory and based on strategic alliances that facilitate tackling and resolving more complex environmental and social problems.

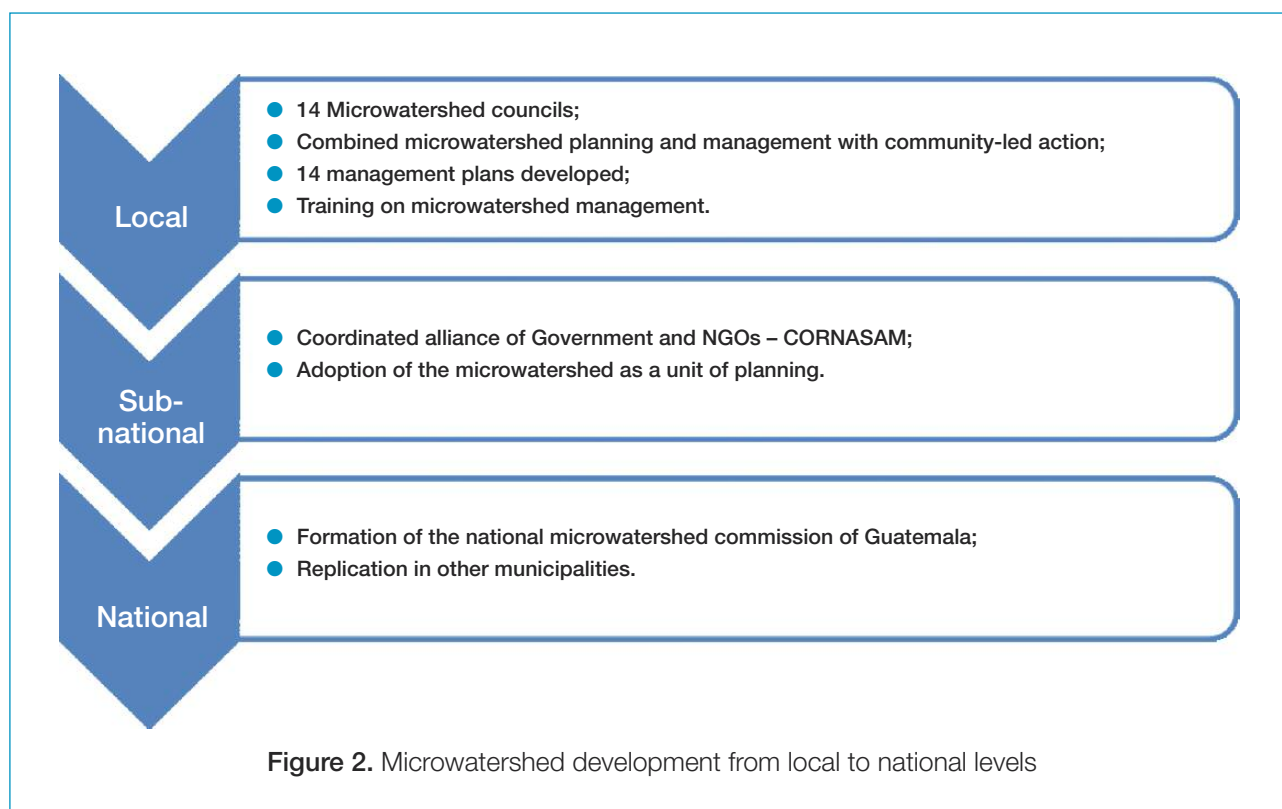
To demonstrate the appropriateness and robustness of the Microwatershed approach, the Tacaná project provided training for water managers in the planning offices of the Ixchiguan, Tajumulco, and San Pablo municipalities in the department of San Marcos, Guatemala. These three have since used the microwatershed

approach to form the new municipal development plans. The mayor of Ixchiguan, Mr. Jerónimo Navarro, explains:

“The municipality of Ixchiguan is the head town of three very important watersheds, those of the Suchiate, Coatán and Cuilco rivers, which are water recharge zones so we need to make the best of efforts toward more comprehensive management of water and the natural resources available in our municipality. Therefore we have adopted the microwatershed-based community water planning and management model developed by the International Union for Conservation of Nature, IUCN.”

Local alliances

At the community level in Guatemala, WANI facilitated the development of alliances with the Community Development Committees (COCODES) and coordinated with Municipal and National Development Councils to enable



integration of micro watershed planning and management with community-led action on development. Project implementation has demonstrated that projects formulated by the communities rather than external institutions respond to the real demands of communities, not just institutional goals.

Sub-national alliances

At the Department level in San Marcos, in Guatemala, an alliance was created with 16 government and non-governmental organizations, to form CORNASAM (the Inter-Institutional Coordination for Natural Resources and the Environment of San Marcos). CORNASAM has adopted the microwatershed as the unit of planning for water and the environment and, together, these groups have coordinated outreach and training in the micro-watershed approach.

National institutions

As a result of the success of the Microwatershed model at the local level, the National Microwatershed Commission of Guatemala has been established at the national level, comprising several government ministries and non-governmental or intergovernmental organizations (Action Against Hunger, FAO and IUCN) to lead application of governance reform through microwatershed management country-wide. This National Commission will facilitate the preparation of national public water policies that outline management plans. A methodological guide for community engagement in the establishment of microwatershed management plans has been produced.

2.5 Transboundary governance

Bi-national forums

Historically, there has been no coordination of basin management between Mexico and

Guatemala for the Coatán and Suchiate rivers. WANI and partners convened the first bi-national forum of mayors to jointly analyze and identify environmental problems in the two basins. This culminated in the signing in December 2006 of the 'Tapachula Declaration of Intent' by mayors on both sides of the border to cooperate in joint actions on watershed management. This provides a platform for information sharing by governmental agencies of Mexico and Guatemala. Actions are now being coordinated to protect forests through joint actions for the prevention and control of forest fires, as well as actions in protected areas.

Shared principles

WANI aimed to promote and facilitate national and transboundary governance approaches similar to those in the Volta River Basin in West Africa where WANI supported the development of a Code of Conduct for the management of water resources. In general, codes of conduct are typically used to establish a set of shared principles or guidelines that will guide the behaviour of a set of actors. Two Draft Codes of Conducts were prepared in 2008 for the Tacaná watersheds. A draft technical action plan for shared watersheds management was produced by technical staff from universities and other institutions from both countries, as an initial step, with support from WANI. A technical group with the participation of scientists and technical staff from each country was formed and several coordination meetings took place.

Since 2008, WANI and partners have facilitated in high level training courses on transboundary watersheds in Guatemala and Mexico. Participants expressed the importance of sharing lessons learned between countries and how these training workshops facilitated this type of discussion.

3. RESULTS AND LESSONS LEARNED

3.1 Synopsis of results

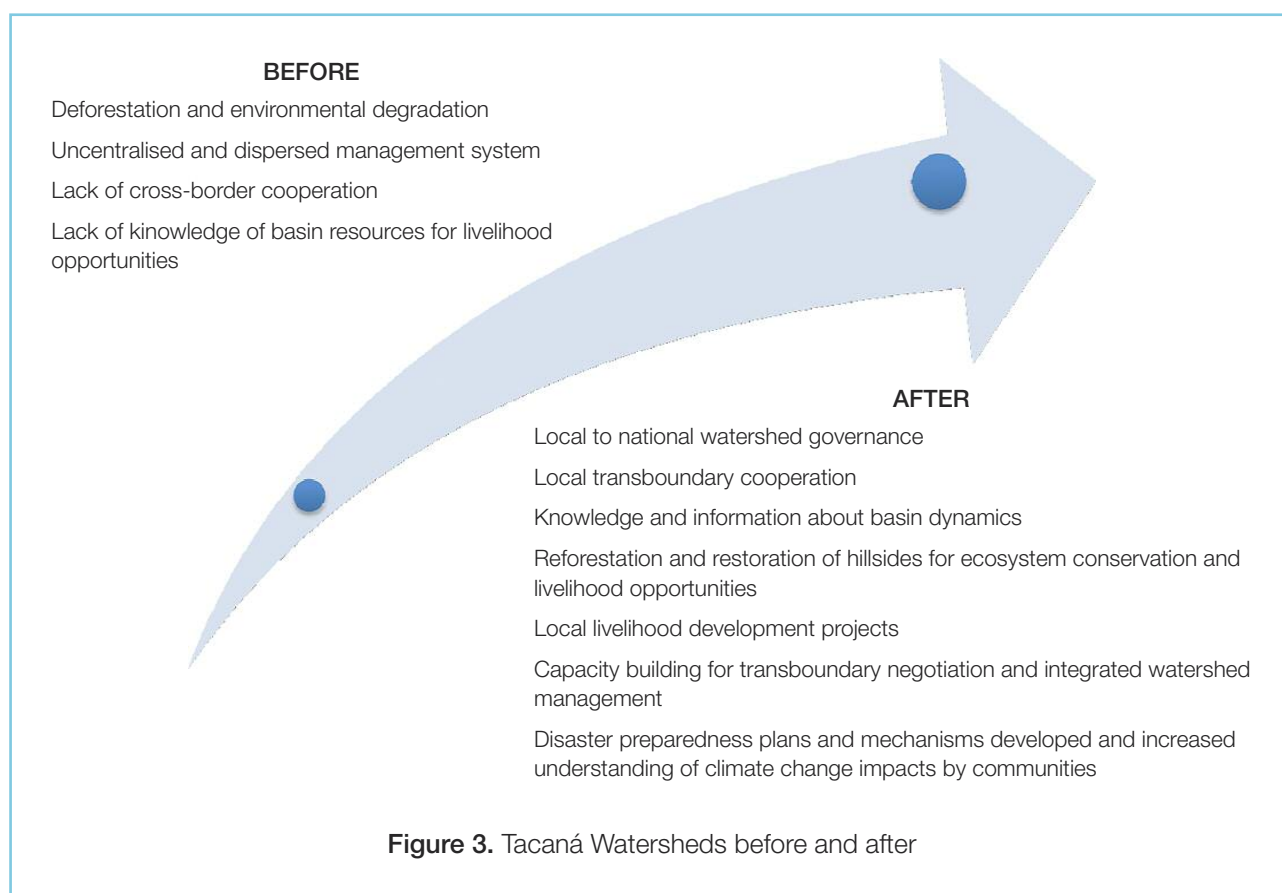
Beginning with a grassroots approach to water management, increased knowledge and information and the improvement of environmental health and livelihoods, the Tacaná region has shown the way forward in scaling up local level approaches to national level initiatives.

Overall, by 2011, a total of 107 projects had been implemented in all microwatersheds, covering the areas of conservation and environmental restoration, food security, income generation and basic social services. Table 1 shows some of the major outcomes of these projects in Guatemala and Mexico.

3.2 Lessons learned

Many lessons have been identified from WANI's work carried out in the Tacaná Watersheds. The main lessons are:

1. Developing local governance and organisational structures benefit and complement IWRM actions. Integrating local communities and their social structures into Microwatershed councils led to greater cohesion and unity. These councils give members control over their resources and as more are formed, the influence spreads across the basin. Successful local models can be scaled up to national level and lead to the formation of national institutions or processes, which can then extend the model to other watersheds.
2. Strengthening community-based alliances and integrating them with municipal and national development institutions increases coordination between administrative levels. This promotes integrated and coordinated water resource planning across the watershed and shared experiences with other community groups and networks.



3. Community-level participation in transboundary water resource management is achievable and adds value to conventional transboundary approaches. Facilitation of community-based management actions has demonstrated that planning and implementation of IWRM can be successfully shared between communities across boundaries.
4. Poverty reduction and increased livelihood opportunities are major concerns at both local and national levels. The challenge is to combine livelihood benefits whilst maintaining environmental sustainability. A range of options combining income generation and environmental conservation initiatives that fully integrates the community can be achieved. Both technical and business training is required, in order for pilot projects to be viable and sustainable.
5. Developing disaster risk management planning should be integral to the overall watershed management planning and not just as an emergency response (as demonstrated by Tropical Storm Stan). This ensures that measures to combat risks such as climate change are part of integrated water resource planning for the microwatershed.

Table 1. Mapping of project activities in Guatemala and Mexico at the local, national and transboundary level

	Guatemala	Mexico
Local level	<ul style="list-style-type: none"> ● 14 Microwatershed Councils established and implementing Action plans; ● Environmental issues put on the agendas of the COCODES with support from CORNASAM; ● Strengthened the Sub-basin Councils in the Coatlán River basin; ● FOGESHIP initiative established (PES) in two locations; ● 8 microwatersheds mapped and a database developed which identifies the most vulnerable areas; ● Micro regionalization of 3 towns from San Marcos Department based in microwatersheds (Ixchiguán, Tajumulco and San Pablo). 	<ul style="list-style-type: none"> ● 9 Microwatershed Councils established; ● 9 Management plans developed and under implementation; ● Cahoacan River Basin Commission created; ● 17 agreements on research, training and actions in the basin; ● 5 basin municipalities working to develop risk management approaches.
National level	<ul style="list-style-type: none"> ● National Microwatershed Commission established; ● PES network established for national information sharing; ● The <i>Mi Cuenca</i> project organized the Presidential Forum on Environment and Development in August 2011. The first such event to be held in the country and attended by seven of the ten candidates running for president of Guatemala. 	<ul style="list-style-type: none"> ● Supported and facilitated the implementation of Water councils outlined in the new Water Law of 2003. With the recognition that the Water councils were too large to implement the national law at the local level, smaller committees were then formed. WANI supported the development of the Cahoacán Watershed Committee, established in 2010.
Trans-boundary	<ul style="list-style-type: none"> ● Creation of Forum for dialogue between the two countries at the very local level (microwatershed councils and commissions). As a result of joint action a project on shared protected areas is being implemented; ● Transboundary cooperation emerged as a critical gap in water governance. Building on lessons learned, WANI-2 is collaborating to support the strengthening of transboundary cooperation in six river basins in the region. 	

4. NEXT STEPS

With WANI and partners interventions finally having come to an end in 2011, the focus is now on the Tacaná watersheds' stakeholders and the governments of Mexico and Guatemala to continue working towards a future where water resources are used sustainably, maintaining both ecosystem health and people's livelihood security. The WANI Tacaná Watersheds demonstration project has built a platform for wider influencing of regional and national water management. The promotion of integrated water resource management and resilience at the local, national and regional level has continued with other projects which mostly focus on governance through microwatershed councils and building resilience through integrated water resource management. The continued livelihoods work is also a strong component in these complementary projects.

From 2007, the Tacaná project was funded by the Dutch Embassy in Guatemala (Embajada del Reino de los Países Bajos) and contributed activities on the Guatemalan side of the border. In Mexico, the Fundación Gonzalo Río Arronte I.A.P. continued implementation in the Cahoacán Watershed. This work builds on previous work in Mexico, in Chiapas, where a Payment for Environmental Hydrological Services scheme was established with an investment of 9,230,608 US dollars for an area of 3,722 hectares. The scheme has been an important tool to encourage conservation and improve livelihoods of the surrounding communities.

Additional support was provided by the Mi Cuenca project funded by Howard G. Buffet Foundation through the Global Water Initiative,

which aims to reduce communities' vulnerability to water-related shocks through integrated water resource management in El Salvador, Guatemala, Honduras and Nicaragua. The IUCN Livelihoods and Landscapes Strategy (LLS) project worked on sustaining the flow of goods and services from forest landscapes for the benefit of local people and biodiversity in San Marcos in Guatemala. This co-finance and leverage initiated by WANI has ensured that the project has achieved its goals and has led to the sustainability of actions on the ground a local to transboundary levels.



Digging and collecting water in Guatemala

Donor support

DGIS –WANI, IUCN, The Dutch Embassy in Guatemala, Fundación Gonzalo Río Arronte I.A.P., Japan Water Forum Fund, UNDP, AMANCO (for JEM), CARE, ACTION AGAINST HUNGER, Howard Buffet Foundation, through the Global water Initiative (GWI). Sociedad de Historia Natural del Soconusco (SHNS) IUCN's member.

The *Mi Cuenca* project, funded by Howard G. Buffet Foundation through the Global Water Initiative (GWI), aimed to reduce communities' vulnerability to water-related shocks through IWRM in El Salvador, Guatemala, Honduras and Nicaragua. *Mi Cuenca* (Manejo Integrado de Cuencas en Centroamérica "Mi Cuenca" (My Watershed) is being implemented in the Department of San Marcos by the consortium IUCN-CARE-CRS, with support from other organizations such as SIMBIOSIS, Fundación AVINA, Fundación Solar, Fundación del Bosque Tropical, Rain Forest Alliance and the National Forest Plan.



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