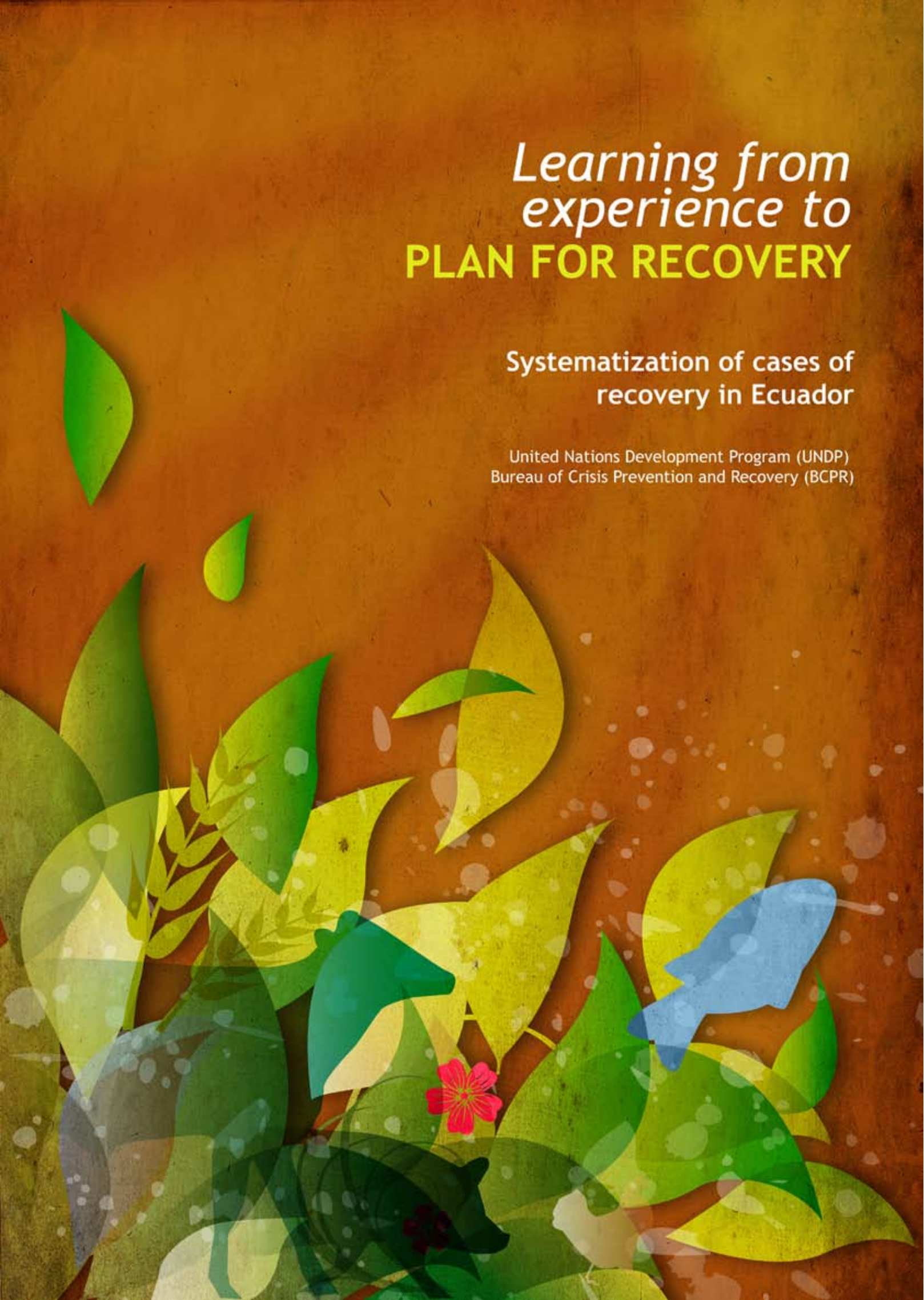
Learning from experience to PLAN FOR RECOVERY

Systematization of cases of recovery in Ecuador

United Nations Development Program (UNDP)
Bureau of Crisis Prevention and Recovery (BCPR)



EUROPEAN COMMISSION

UNDP Ecuador

I would like to stop time here in Cevallos, to find nostalgic explanations that can interpret the feelings of each of our neighbors, who from the first roar of the Tungurahua Volcano, in October 1999, saw their lives change dramatically. In an instant, they were invaded by desperation, uncertainty, pain and suffering, without even understanding this cyclical phenomenon of nature, which in this generation we have had to experience, paradoxically both as witnesses of the splendor and natural beauty of a once-in-a-lifetime event, while at the same time shaken by the destructive aftermath, the first lesson of which was humility in the face of creation, which makes a mockery of any human attempt at dominance.

We will never forget the day when the ash covered our orchards, crops, our homes and streets, and overwhelmed we gathered the pulverized rock which little by little took away from us our means of production.

That was the first desperation that we experienced, which could have put an end to our dreams of better times. But that nostalgia of pain and suffering was soon transformed into hope, because we have a big heart and in a shout of unity louder than Mama Tungurahua herself, we decided to use our adversity and turn it into an opportunity to create a new destiny.

Extract from the speech made by Bayardo Constante, Mayor of the Cevallos canton, on the commemoration of the World Disaster Reduction Day.

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Construction of Aquaculture pools, Palenque - Los Ríos , Photo: Alonso Morante

Foreword

Ecuador regularly suffers from the ravages of natural phenomena, which severely endanger its population and threaten to set back the achievement of its development goals. In the past decade, in addition to the recurring activity of the Tungurahua volcano, there have been prolonged and unexpected dry and rainy seasons; the impacts of these events have affected productive activities, people and entire regions. However, the country has not been powerless in the face of these events: as it responds to them, it sets the foundation to recover the wealth, jobs and property that were lost, along with the well-being of the people affected.

This document summarizes the recovery efforts put in motion at the local and regional level following two events: the prolonged eruption of the Tungurahua volcano, whose impacts have extended far beyond its direct zone of influence; and the intense rainy season of the first half of 2008, which affected 13 of the country's 24 provinces.

Based on a review of documents, site visits and interviews with the main stakeholders involved in these processes, our intention here is to describe the strategies employed to restore jobs and livelihoods that were affected by the disasters. The document describes the actions that were carried out, and above all, the lessons learned from them, which will help the country to better plan its recovery efforts in the future.

This document is part of a joint effort of the National Risk Management Secretariat and the United Nations Development Program, with support from the Bureau of Crisis Prevention and Recovery, and its initiative to encourage pre-disaster recovery planning. We hope that it will be useful in our ongoing task to continue to strengthen national efforts.

José Manuel Hermida
UNDP Resident Representative in Ecuador

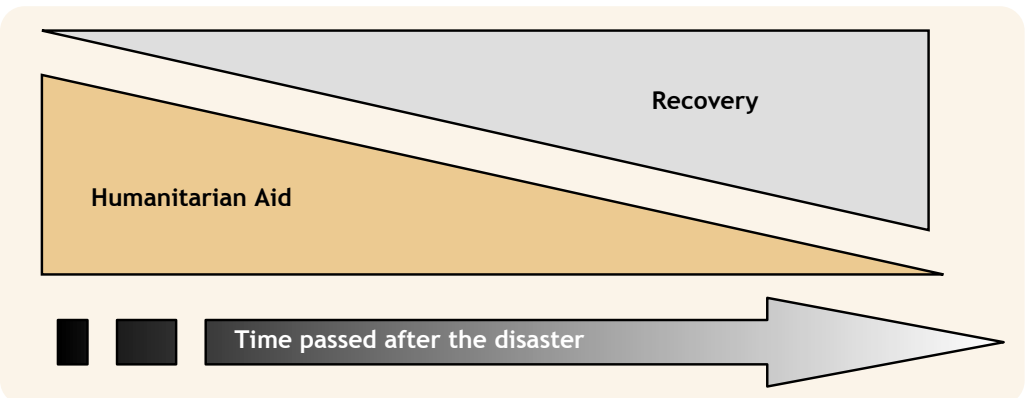
Introduction

The International Strategy for Disaster Reduction (ISDR) defines recovery as the set of "*Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk*." The Bureau for Crisis Prevention and Recovery (BCPR) states that "*Managing recovery will require building national capacities, restoring coping mechanisms, empowering communities and determining root causes and vulnerabilities which make societies disaster-prone.*"

Disasters can become opportunities for sustainable development. For this to happen, recovery must go beyond replacing or repairing damaged infrastructure, and address the root causes of unsustainability and risks. While responding to the most urgent needs of the affected population, all opportunities for change must be taken advantage of in order to achieve the sustainability of the recovery efforts and set the foundations for a new kind of development going forward.

Post-disaster recovery is part of a continuum that begins with the preparations made before an event takes place (called Advance Recovery Planning), then moves to the provision of immediate attention to the emergency and finally recovery efforts; from providing immediate aid to victims in order to save lives, to restoring the functioning of society. In the initial moments, response institutions focus their work on accounting for the victims, rescue efforts, attending to the wounded and satisfying basic needs for food, water, shelter and health of those affected. Progressively, the focus moves toward facilitate access and mobility for people, ensuring the habitability of the buildings still standing, removing debris, recovering people's livelihoods and ensuring governance and national sovereignty.

The post-disaster continuum: from humanitarian aid to recovery



The correlation between disasters and poverty is becoming more and more evident; disasters paralyze production and drastically reduce household incomes. These effects are quite varied, depending on whether or not the affected are urban or rural workers, if they are part of the formal or informal sectors of the economy, and if they are men or women. In order to mitigate these effects, it is necessary to protect jobs and salaries and to create temporary and/or permanent jobs, in order to return to people their ability to earn an income to cover the expenses incurred after the event, their basic needs and to give them back their dignity, so they can move as soon as possible out of the position of being passive recipients of humanitarian aid.

Protecting employment means ensuring job stability; protecting salaries, on the other hand, is related to maintaining the incomes of people who lose their jobs due to a disaster, through direct transfers from governments or private insurance plans[1]. However, the benefits of job and salary protection in these situations only reach the minority who enjoy formal employment, and do not reach people engaged in the informal sector of the economy[2], who live in rural areas and rarely are they afforded to women.

In post-disaster situations, employment and income-generation policies must be aimed especially at the unprotected informal sector and be associated with anti-poverty policies. Temporary employment programs used to rebuild infrastructure with the intensive use of manpower and local resources have contributed effectively to recuperating assets in isolated areas, improving the survival conditions of affected people, recapitalizing victims with the expectation of a recovery of productive assets, thus reducing pressure on humanitarian aid efforts and reducing the psychological pressure suffered by the people affected (Salomon, 2010).

In the rural sector, livelihood recovery strategies seek to replace assets that were lost in the disaster, ensuring self-sufficiency in food production in the relatively short term, depending on agricultural cycles. Seeds, livestock, and tools are provided to replace what was lost. These strategies also include the refinancing of debts; in Ecuador, the National Development Bank (*Banco Nacional de Fomento*, or BNF) allows borrowers to refinance agricultural debts in post-disaster situations. Another strategy is to develop productive products aimed at establishing food security through diversified production; these interventions can also include community and institutional development components.

In that sense, each disaster provides opportunities to generate employment, both in the affected area as well as in surrounding areas and nationally: to restore the damaged infrastructure, to accommodate and attend to the displaced and their needs for food, housing, water, psychological support, etc. In addition, during and after the emergency, there are usually supplemental funds channeled as humanitarian aid, both from the government as well as international cooperation entities, to attend to those needs.

1 In Ecuador, for these purposes one could apply to the Reserve Fund of the Ecuadorian Social Security Institute (IESS), as long as the affiliated person has not withdrawn those funds previously.

2 Jobs are informal when they are not "recognized nor protected within the legal and regulatory frameworks." The ILO defines this as the "unprotected sector". While in principle a lack of protection and informality was associated with urban areas, the FAO announced that there is also unprotected work in rural areas.

The systematization process

The goal of this document was to describe how the recovery strategies and projects that were implemented after floods affected a large part of the country during the first half of 2008[3], were formulated. It also looks at the initiatives put in place by the Municipality of the Cevallos Canton to overcome the impacts of the fallen ash resulting from the prolonged eruptive process of the nearby Tungurahua volcano.

The document describes the impacts resulting from the destruction of two natural phenomena: the ash covering the canton of Cevallos as a result of the eruption of Tungurahua, which began in 1999 and which has lasted to the present day with periodic volcanic activity; and the intense rainy season of 2008, which affected 13 of the 24 provinces of the country. The description of these two devastating phenomena provide a backdrop for the recovery efforts.

The next section describes the political and operational context in which the authorities responsible had to work, as well as the way in which the strategies and projects were designed, and the factors which influenced the achievement of results; and examines in detail the livelihood recovery and job creation projects implemented -- in the case of the coastal region, by the Ministries of Agriculture and Environment, and in the case of Tungurahua, by the municipality of the canton of Cevallos. The common and specific elements of the two interventions are identified, with an emphasis on those that should be taken into account for advance recovery planning.

Finally, the document describes how the transition from the response phase to the recovery phase happened, and the institutional arrangements involved; then there is a summary of the recovery projects, their characteristics, results and impacts, as well as other dimensions that have to do with the relevance, efficacy and sustainability of the initiatives. In the final section containing the conclusions, there is an effort to identify those factors that could contribute to the success of a program to restore livelihoods after a disaster, and thus should be replicated in future planning exercises.

The work is based on a review of an extensive list of printed and electronic documents, reports and presentations. The team preparing the document also visited and interviewed officials from the entities who financed and executed the projects, along with the beneficiaries, in the provinces of Guayas, Santa Elena and Tungurahua, during the month of July 2010.

3 According to the BCPR, recovery takes a number of elements into account: rehabilitation and restoration of the local built environment and infrastructure; primary infrastructure and essential facilities to maintain the life of the population; the management of environmental resources and water; housing and resettlement; and employment and livelihoods. However, this document only analyzes the initiatives related to the recovery of livelihoods and employment.

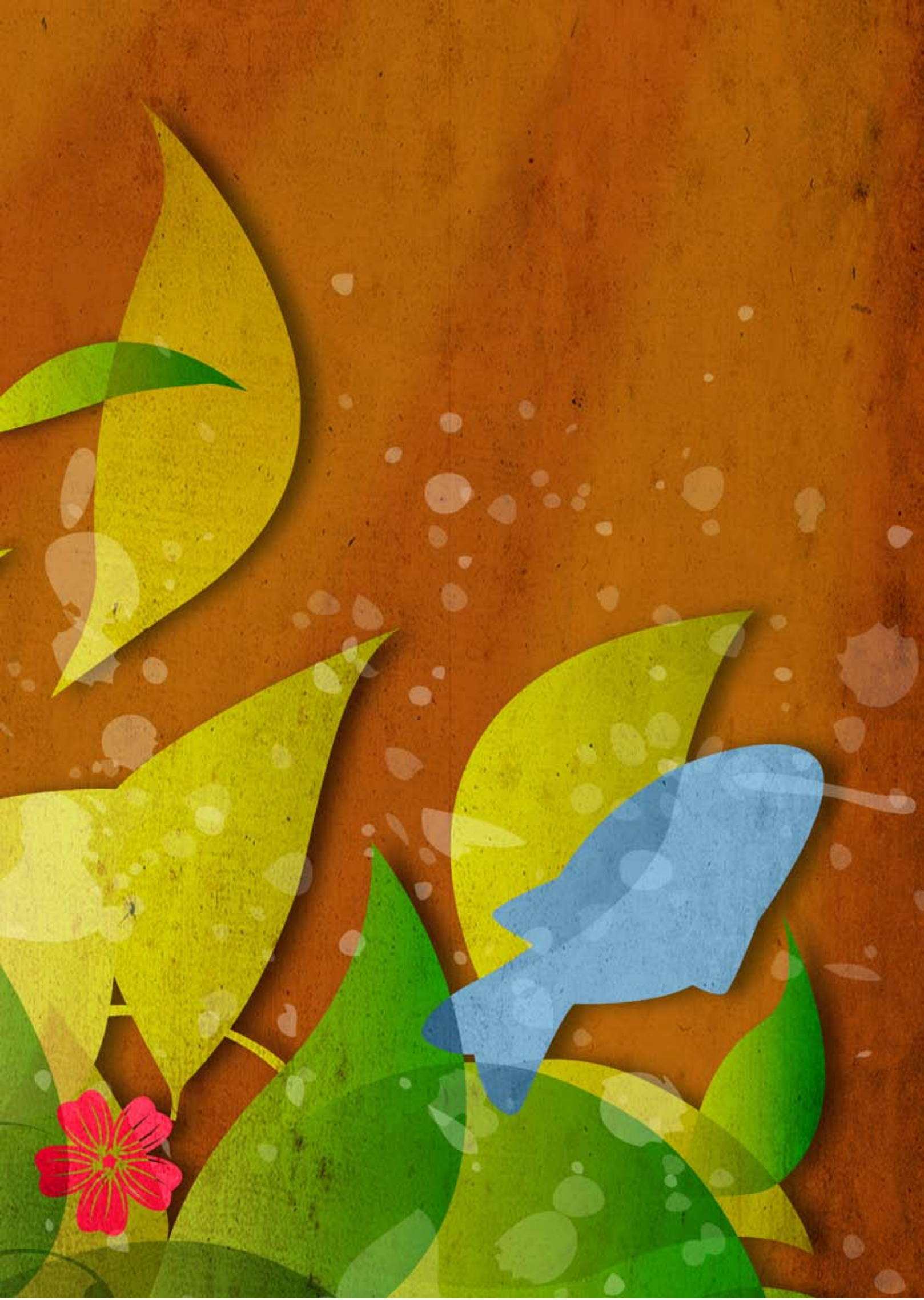
How these experiences contribute to building capacities for advance post-disaster recovery planning

The experiences studied are unique cases in which recovery has taken place as a deliberate process, which continues the response phase but which has its own characteristics, the ultimate goal of which is to overcome vulnerability. With a view to the advance planning of post-disaster recovery, it is important to highlight the merits and lessons learned from these processes.

UNDP/BCPR (2008) provides some basic points in planning recovery processes. The matrix below attempts to make connections between those guidelines and the salient aspects of the cases reviewed here.

Steps to take in recovery planning – UNDP/BCPR (2008)	Cases studied
Define the institutional framework and the mechanisms to design, coordinate, implement and monitor recovery programs, ideally based on already existing institutions and procedures.	In the case of the coastal region, novel institutional arrangements were established: territorially based coordination, a regional Emergency Operations Command (EOC), sectoral working groups…with the exception of the regional EOC, all of the participating institutions already existed. The novel part was the effective coordination that was established. Therefore, this experience marked an innovation in terms of procedures.

Steps to take in recovery planning – UNDP/BCPR (2008)	Cases studied
Define and execute national recovery policies, establishing clear principles that the country will apply in all recovery efforts; Develop a recovery plan, detailing general and sector-specific requirements; and Assess and improve institutional capacity.	The Constitution which was passed in 2008 establishes a national decentralized risk management system, which is the basis for making recovery policies. An examination of various post-flooding recovery experiences (Blacio, 2009) concludes that normally, the recovery is focused on rebuilding infrastructure, with little or no attention paid to other essential aspects related to reducing vulnerability and poverty (jobs and livelihoods, essential infrastructure, environment and water, housing, resettlement). In the processes and projects analyzed for this document, one notes an intentional effort to plan recovery using a holistic approach focused on reducing vulnerability. In the case of the coastal region, in the end a recovery plan was approved that was focused on infrastructure, but other kinds of projects (which are examined here) were funded and executed.
Identify needs, priorities and capacities for recovery	It is worth noting the effort of the Ministry of the Coastal Region to strengthen more than 80 canton EOCs through capacity-building workshops; the current SNGR "inherited" this capacity. The Municipality of Cevallos carries out ongoing programs to provide training and strengthen productive associations. The sustainability of these efforts can only be tested after future extreme events
Define a strategy of alliances to implement the recovery	Both experiences are examples of coordination and alliances, the strategies of which are examined extensively in the text.



The context of the recovery: flooding in the Ecuadorian coast

The winter of 2008

The winter or rainy season in the coastal regions of Ecuador normally takes place in the first half of the year. However, between the months of January and April 2008, and despite the predictions that the rainfall would be normal for the season, intense and concentrated rains, accompanied by hurricane-strength winds and thunderstorms, battered the entire coast. The precipitation levels were 30% higher than average for the winter season (INAMHI, cited in ESAE, 2008) but did not surpass the levels reached during the El Niño phenomenon in the previous century (INOCAR, 2008).

By April 2008, the rains had affected 66 cantons in thirteen provinces: Esmeraldas, Manabí, Los Ríos, Guayas, Santa Elena, El Oro and the low-lying areas of the provinces of Loja, Santo Domingo de los Tsáchilas, Bolívar, Cañar, Azuay, Chimborazo and Cotopaxi. The damage also extended to urban areas: large population centers remained more than 60 days under water. In addition to the flooding, there were landslides and closed roads, leaving many communities completely isolated. In total, 275,000 people were affected (that is, around 2% of the Ecuadorian population) and 64 deaths were recorded.

Fish Planting, Photo: Xavier Romero, Sub-secretariat of Aquaculture

The humanitarian response included, among many other measures, the establishment of more than 300 shelters and the distribution of 580,000 food rations, the provisional installation of 8 water treatment plants and the supply of safe water and chlorine in all affected provinces; in addition, approximately 71,000 Emergency Bonds (of US$240 each) were distributed (Ministry of the Coast/UNDP, 2008). While there is no official figure, it is estimated that the cost of the response was around $121 million, in addition to a similar amount spent by local governments (Portaluppi, 2010).

Total losses were on the order of 1.2 billion dollars, equivalent to 2.5% of the country's gross domestic product (GDP) for that year. Production was seriously affected; below is a description of the impacts that are related to the projects studied in this document (ESAE, 2008):

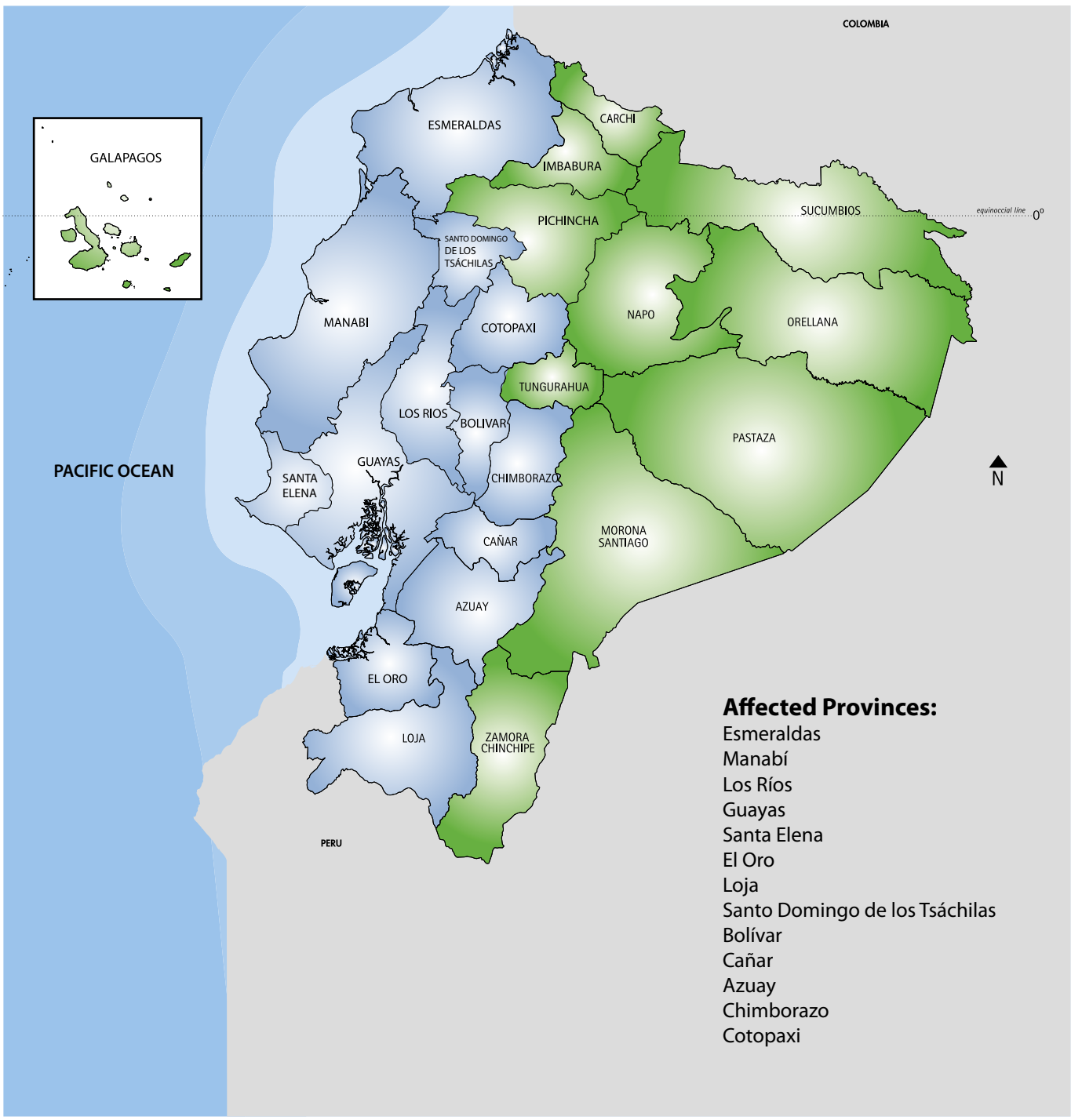
- The Los Rios province suffered the most losses of crops; followed in order of magnitude by Guayas. These two provinces accounted for 81% of the total surface area of lost crops (MAGAP, cited by ESAE, 2008).
- The province of Los Rios recorded the greatest losses of rice (25,701 hectares), followed by Guayas (9,930). Manabi province lost the most corn crops (7,127 hectares), followed by Los Rios (5,080 hectares), while around 2,500 hectares of cacao were lost in Guayas and Los Rios. These two provinces also suffered the greatest losses of banana and plantain crops.
- In total, 52% of the households interviewed for the ESAE study reported that their main crop was completely damaged, with a much higher percentage in Los Rios and Guayas and only 5% in El Oro.

Flooded crops, Photo: Borja Santos Porras, UNDP

- The key informants interviewed for the ESAE study stated that rice, plantains, corn, vegetables and beans could not be recovered in over half of the communities, and were only partially recoverable in a third of them. The most critical situation was related to the yucca, with a loss of over half of the crops and almost no possibility of recovery.
- Both for farmers and for the day laborers dependent on agriculture, the significant damage to major crops represented a high risk of decreased income and employment.
- The loss of crops which in many cases were about to be harvested, meant a huge loss of income and food security for families dependent on agriculture.
- Nearly 40% of the families interviewed identified food as their primary necessity, followed by construction materials and drinking water. Among the secondary needs, although food continued to be of critical importance, medicine and health care were priorities for most households. In addition, 15% of households indicated that their secondary need was employment and income generation.
- Some families maintained an adequate level of consumption and access, but at the cost of selling their assets and going into debt, which implies a loss of capital and a threat to their future livelihood.
- In addition, the surface area planted in the first half of 2008 was less than the same period in 2007. The rains reduced the area suitable for planting rice and corn, since most of the land was flooded or retained too much moisture, which made it impossible to plant properly and thus reduced investments in these sectors.

Flooded School, Photo: Borja Santos Porras, UNDP

Provinces Affected during the 2008 rainy season in Ecuador



The response (phase R1): an exercise that set the foundation for recovery

The response, which was called by the stakeholders involved as "Phase R1", was organized around 4 areas (Cordero, 2008; Blacio, 2009), which are briefly described below:

Saving lives and protecting people: evacuation and rescue, food assistance, protection for the population living in shelters and/or the distribution of the emergency bond ($240); medical assistance, water, basic sanitation and housing, vector control. An estimated US$58,701,778 was allocated to these tasks.

Protecting physical infrastructure: The road infrastructure and vital communication lines were repaired through more than 300 projects, with a total of US$35,260,000 spent.

Building response capacities: Damage assessment (EDAN) teams were activated, along with 90 canton-level Emergency Operation Committees (EOCs) and 10 situation rooms; response coordination mechanisms were put in place, budgets were prepared and projects and spending were monitored. In addition, 84 contingency plans were formed in the most affected cantons. In this area, around US$1,269,275 was spent.

Protecting people's livelihoods: Follow up was done on the impacts on agriculture, fishing and livestock. In the early response phase, livelihood protection included activities like protecting and rehabilitating productive infrastructure, moving animals and establishing coordination mechanisms with local authorities early on.

The institutional and planning panorama in place in Ecuador when the rainy season of 2008 hit was very different from that which existed during previous extreme events. In effect, the government of President Rafael Correa, who took office on January 15, 2007, introduced important changes in the public institutional framework, strengthening the role of the State in all areas of national life. In terms of risk management, the government continued with the process of transformation that had begun in 2006, when the Technical Secretariat of the Social Front (STFS) assumed the responsibility for coordinating the humanitarian response to the reactivation of the Tungurahua volcano. This marked a shift from a vision focused on managing emergencies (and centered around an institution dedicated to response, the Civil Defense) to a more holistic approach. In early 2008, a process was underway that would culminate, in April of that year, with the creation of the Technical Risk Management Secretariat or STGR (currently the National Risk Management Secretariat, or SNGR for its initials in Spanish).

In terms of territorial management, in August 2007, the government had created the Ministry of the Coast, whose mandate was to take charge of *"the policies, plans, programs, projects and actions adopted by the different institutions of the Central and*

Institutional Public Administration in the provinces of Esmeraldas, Manabi, Guayas, Los Rios and El Oro…it may coordinate with any other public institution as required to fulfill its function."

This entity was designated as the leader of the disaster response and humanitarian assistance efforts following the 2008 floods; it was prepared for this task, since it was a continuation of a process of inter-sectoral and inter-institutional coordination that had already been tested, from the beginning of the current administration, by the regional sub-secretariats of the coast to mutually support each other and to respond to other emergencies, like the prolonged drought that the coast experienced in 2007 (Portaluppi, 2010). In order to organize the response within its territorial jurisdiction, the Ministry of the Coast promoted the creation of a Regional Situation Room and a Regional Emergency Operations Command (EOC), which included the participation of the Coordinating Ministry of Internal and External Security, who was in charge of the Civil Defense and the STGR, and the Joint Command of the Armed Forces (COMACO). In addition, provincial Situation Rooms, 90 canton EOCs and 3 parish EOCs were established (Blacio, 2009). All of this strengthened and empowered local authorities, who were on the front lines of the response.

Undoubtedly, the joint participation of the national entity with a sector-specific focus (the STGR) and the ministry, dedicated to managing the regional space where the disaster occurred, introduced tensions in the response and later recovery process. These were overcome thanks to political agreements that were reached, which helped to clearly delimit the roles and responsibilities of each party (Portaluppi, 2010). In the same way, agreements were reached with the Armed Forces, also designated as participants in the response[4], and the other government ministries which took part in the sectoral working groups (see below). As indicated in an earlier publication:

"*Therefore there was coordination and a kind of distribution of responsibilities in the territorial coordination at different levels. The Coordinating Ministry of Internal and External Security assumed the role of coordinator at the national level, especially in organizing the EOCs at the national level; the Ministry of the Coast coordinated the first stage of the humanitarian response at the regional level, and then coordinated with the Joint Command of the Armed Forces; and the Armed Forces assumed, after the second presidential decree, the coordination of the national mobilization for emergency actions in the entire territory. Also, the regional Emergency Operations Center, which operated the entire time in the building of the Government of the Coastal Region…"* (Cordero, 2008).

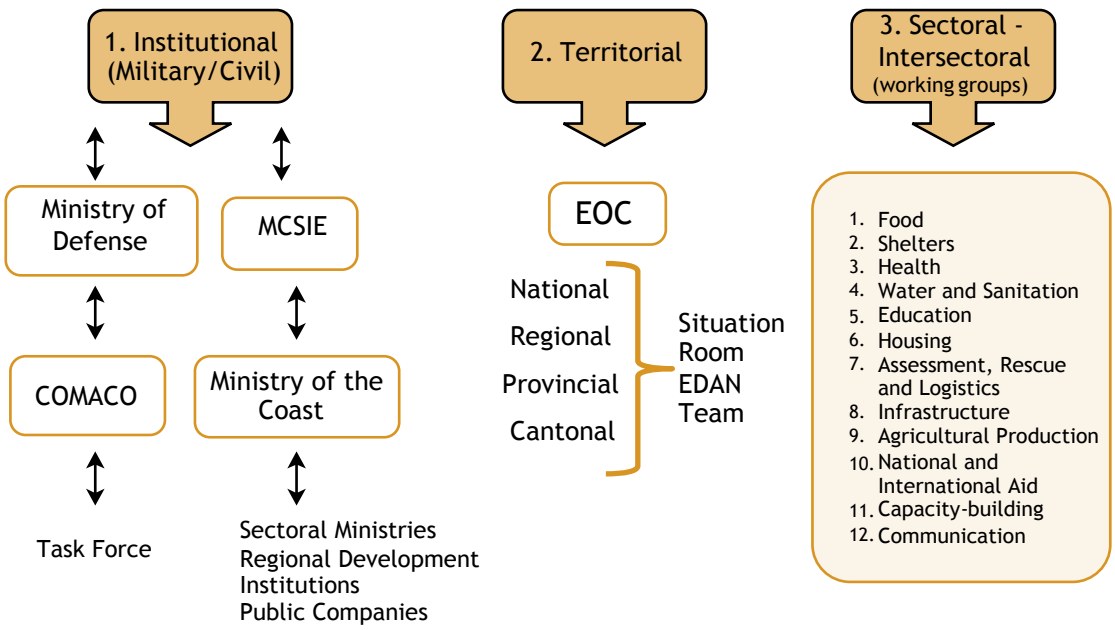
The sectoral working groups organized by the Ministry of the Coast with technical assistance from various United Nations institutions, produced assessments of damages and needs throughout the affected territory, with sector-specific emphases that made it possible to better organize the response (Fernandez, 2008; Cordero, 2008). These same working groups began to become, over time, spaces where the recovery was discussed and planned (see later on in the text). In all, 12 working groups were established: Evacuation, Rescue and Logistics; Shelters; Food; Water and Sanitation;

4 Presidential Decree 926 of February 20, 2008. This decree marks a policy shift, since until that year, the Armed Forces did not intervene in emergencies caused by natural disasters.

Health; Agriculture and Production; Infrastructure; Humanitarian Aid and Donations; Strengthening the EOCs; Education; and Scientific-Technical Support (Cordero, 2008).

During the response phase, the perspectives of all of these actors were organized into three groups: the institutions (ministries, development organizations, the military); the organization of the territory through the canton-level, provincial, regional and national EOCs; and finally, sector-specific issues with the organization of the working groups. The following diagram summarizes this arrangement:

Integrating three perspectives in the Humanitarian Response (Phase R1)



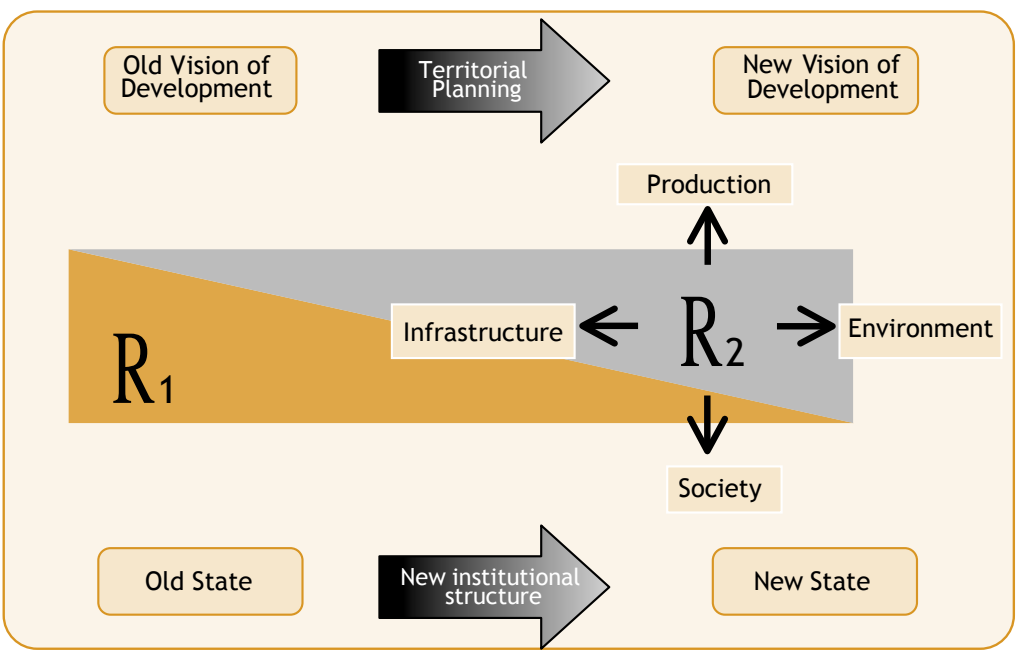
Source: Ministry of the Coast, 2008

The transition from response to recovery (from Phase R1 to Phase R2)

Already in March, when the rains had still not let up, UNDP/BCPR sponsored a workshop with the United Nations agencies that are part of the UNETE group and the National Government on how to move from humanitarian response to recovery (Ministry of the Coast/UNDP, 2008). The objective of the workshop was "*To identify lessons learned and propose public policies and concrete actions that can improve the handling of the emergency and stimulate the process of early and long-term recovery that the National Government strives for.*" As part of the agenda, participants learned about response and recovery experiences in Ecuador and other countries in Latin America; in addition, the multi-sector working groups analyzed their strengths and weakness and formulated proposals to continue with the response and move on to the recovery phase.

The workshop emphasized the continuity between the response and recovery phases, indicating that during the emergency "*important and vital decisions are made that shape the recovery*." (Zilbert, 2008). The continuum between both phases was conceived of as a process that also would make it possible to move toward a new vision of development in the affected territory. The risks are resulting from social processes that derive from the development models implemented; that is why it is important to move from the old State which does not plan and does not take the situation of the territory into account, to the presence of the State as the guiding force behind risk management policy, which considers the problems but also the potential of the territory in terms of society, production, the environment and infrastructure. Thus, risk management is a component of development management. The recovery phase was to be organized around 4 strategic lines: Production, Environment, Social, and Infrastructure. The following diagram illustrates these concepts:

Transition from emergency (Phase R1) to recovery (Phase R2) and integrated risk management. Source: Ministry of the Coast



This illustration highlights the importance of a planning vision that makes it possible to achieve the development objectives that are currently expressed in the National Good Living ("*Buen Vivir*") Plan. The continuity between one phase and the next is based on a familiarity with the affected territory and on a strong coordination role played by entities with a holistic vision of risk management. It is hoped that this way of organizing the process would lead to structured efforts to address the development needs and the vulnerability of the affected areas.

Recovery would not mean a break in the coordination arrangements put in place during the response; at the end of May, it was proposed that most of the sectoral working groups continue with their work, this time grouped under the four strategic lines mentioned above:

Strategic Line	Participating working groups	Agenda at the end of May 2008
Infrastructure	Infrastructure	▪ Repair and replace housing ▪ Repair educational infrastructure at 600 schools in imminent danger
Production	Agriculture and production	▪ Early recovery of work, jobs and livelihoods
Social sector	Shelters Food Rescue, Evacuation and Security Health Strengthening the EOCs in critical areas Humanitarian aid and donations	▪ Target the food assistance to people in shelters ▪ Insert the coordination platform (EOCs, working groups, etc.) established during the emergency to give institutional support to recovery efforts. ▪ Document the Contingency Plan and prepare a guide (as an operational model) for humanitarian response ▪ Systematize the experience, centered on the coordination of the humanitarian response and the role of the regional government ▪ Accountability
Water and Sanitation	Environmental water and sanitation provision	▪ Epidemiological monitoring, vector control and disease prevention ▪ Sanitation for affected communities

The following matrix highlights the elements that would mark the transition from one phase to the other, from the point of view of their strategic approach and the actors who would lead the process:

Stages, objectives, strategies and actors in response and recovery

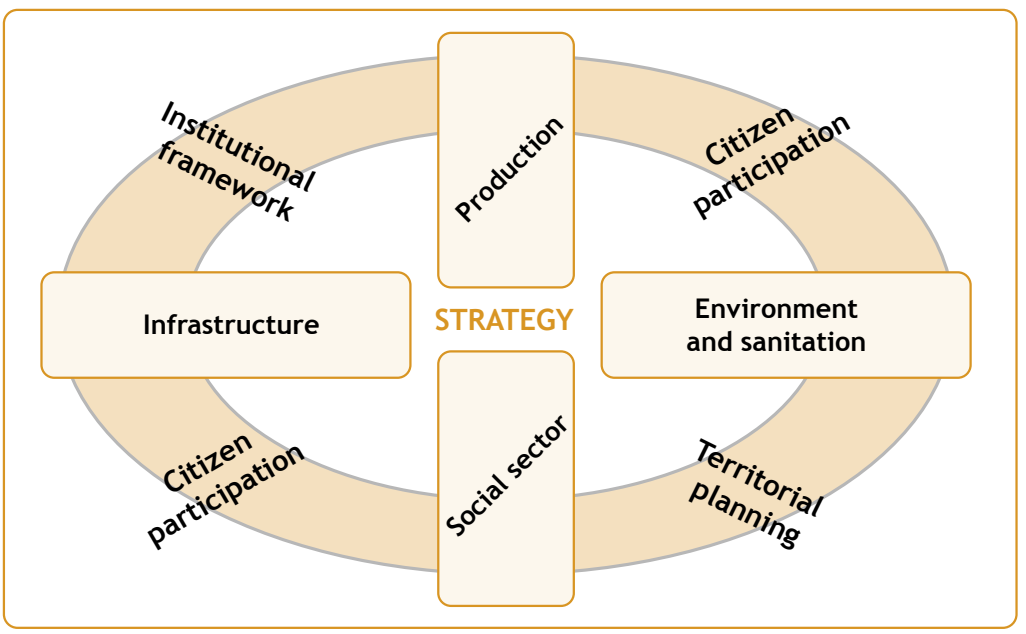
	Stage I: Emergency reaction and response (R1)	Stage II: Reconstruction, focus on prevention (R2)
Objective	Protect human life, livelihoods and physical infrastructure, supported by building capacities	Restore infrastructure, production, social services and facilitate the creation of sustainable opportunities for the affected population
Strategy	Act immediately based on the information available at the time.	Identify and prioritize actions based on a multi-disciplinary diagnostic assessment and analysis of the situation of the affected territory
Coordinated and led by	Ministry of the Coast (Sectoral/ Territorial)	Ministry of the Coast and Coordinating Ministry of Internal and External Security Technical Secretariat: SENPLADES

The Recovery Plan

After the March workshop, and under the leadership of the Regional Undersecretary of SENPLADES, the members of the working groups, universities and other stakeholders formulated (for the first time in Ecuador) a plan to recover from the impacts caused by the rainy season, with a territorial vision grounded in the lessons learned during the humanitarian response to the floods. The purpose of the plan was to guide all actions of the national, provincial and local governments to reduce the risk of disasters.

The following diagram shows how the relationship between the thematic and cross-cutting components (or strategic lines) of the recovery processes was conceived of. Recovery is a process that involves a number of sector-specific elements: production, infrastructure, environment and sanitation, employment, gender equity, human rights, etc. In order for society to be able to not only recover its previous level of functioning, but to orient its development toward greater sustainability, the territory needs to be planned in order to minimize risks, strengthen institutions and promote citizen commitment and participation in decision-making.

Thematic and cross-cutting components of the recovery process. Source: Sub-secretariat of Planning of the Coast



The box below summarizes the main characteristics of the Recovery Plan:

Box: Elements of the Recovery Plan

General objective of the recovery process

To guide governmental actions, integrating risk management in the construction of new conditions for development in the region that guarantee economic sustainability and a improved quality of life of the population.

Specific objectives

1. To identify and rehabilitate the basic infrastructure affected; build new infrastructure necessary to improve the integration and harmonious development of the territory.
2. Strengthen the agricultural sector and the social infrastructure, as fundamental elements of social and economic well-being of the population, through re-conversion initiatives.
3. Promote a health and sustainable environment that guarantees the preservation of life and natural resources.
4. Strengthen the development of an integrated information system that serves both the processes of planning as well as of immediate emergency response.
5. Guide short, medium and long-term investments in order to execute programs and projects that reduce vulnerability, build up the basic and productive infrastructure to be able to face the threat of rain, within the framework of a strengthened institutional system with a new vision of development.

Products

1. A schedule of sector-specific investments for the short, medium and long-term (based on budgets allocated by the different institutions).
2. A system for monitoring and evaluating the programs and projects aimed at reducing vulnerability.
3. An information system for risk management (as a mechanism to unite and formalize the information).
4. Proposed guidelines that incorporate risk management into the territorial planning framework.
5. Proposed guidelines for the operation of an institutional system to manage risks.

Principles of the process

- Foster human development and poverty reduction
- Establish coordination mechanisms at the national, regional and local scales.
- Recover and re-convert the livelihoods of the population.
- Prevent and reduce the resurgence of vulnerabilities of all kinds.
- Restore local capacities, take advantage of and build up the institutions created through the EOCs.
- Focus efforts on the most vulnerable groups.
- Promote the responsible empowerment of the population.

This plan was not finally approved by the national government; however, a series of measures and projects related to various aspects of recovery were funded and implemented, which attempted to create temporary jobs, some of which are summarized in this systematization (see the following chapter).

At the same time, a program had been formulated focused on rehabilitating infrastructure, with an estimated investment of one billion dollars over the next two years, which will be financed with resources from the General State Budget and with reimbursable and non-reimbursable international aid. The program will be coordinated by a secretariat attached to the Presidency of the Republic, and executed by the ministries and regional development entities. There are no consolidated reports available on the execution of this program, which later became a part of sectoral agendas.

Strengthening the institutional framework for Risk Management[5]

For the recovery phase, the Ministry of the Coast had established a new Mission: "*To coordinate the policies, programs and actions of the government in the region, aimed at reducing the vulnerability of the population, encouraging processes of de-concentration and decentralization, which contribute to good living and risk reduction*." (Blacio, 2009). In order to achieve this, the Ministry proposed a working agenda with the following objectives: Coordinate the recovery efforts in the region, lead the livelihood recovery program and strengthen local governments and their risk management capacities.

In this context, the "*Project to Build Local Public and Community Capacities in Risk Management in the Coastal Region*",was launched in July 2008. A team of 25 professionals carried out, with the participation of local EOCs, 85 workshops focused on recovery. The participants were trained in risk management, they systematized and analyzed information on local impacts and the measures put in place to address them and formulated plans that included details on priority recovery works and operations, their geographic locations, deadlines, characteristics and fundamental indicators, the institutions and persons responsible, as well as the possible costs and sources of funding. The information was translated into maps that summarize the risks and resources of each canton. In addition, 10 heads of regional and provincial situation rooms, 80 heads of canton-level situation rooms and 80 EDAN teams received training.

5 Based on Blacio, 2009

Field school, Sub secretariat of Aquaculture, 2009

Synthesis of the recovery projects

This chapter systematizes the most important aspects of the recovery process after the flooding in the coastal region in 2008, as well as the recuperation of livelihoods in the Cevallos canton after the eruption and ash fall from the Tungurahua volcano.

Recovery Projects Implemented in Relationship to the Flooded Areas of 2008

Already in April 2008, all of the interventions summarized here were in the initial assessment phase or had begun activities. Out of all of the projects, this document analyses three: Forestry Nurseries, Community Aquaculture and Infrastructure Reconstruction in Protected Areas. All of the projects implemented were focused on rural areas – although the urban coastal areas were flooded for a long time, no precise studies were done on the effect on urban life, much less were interventions designed for those areas.

Flooded Urban Area, Photo: Borja Santos Porras, UNDP

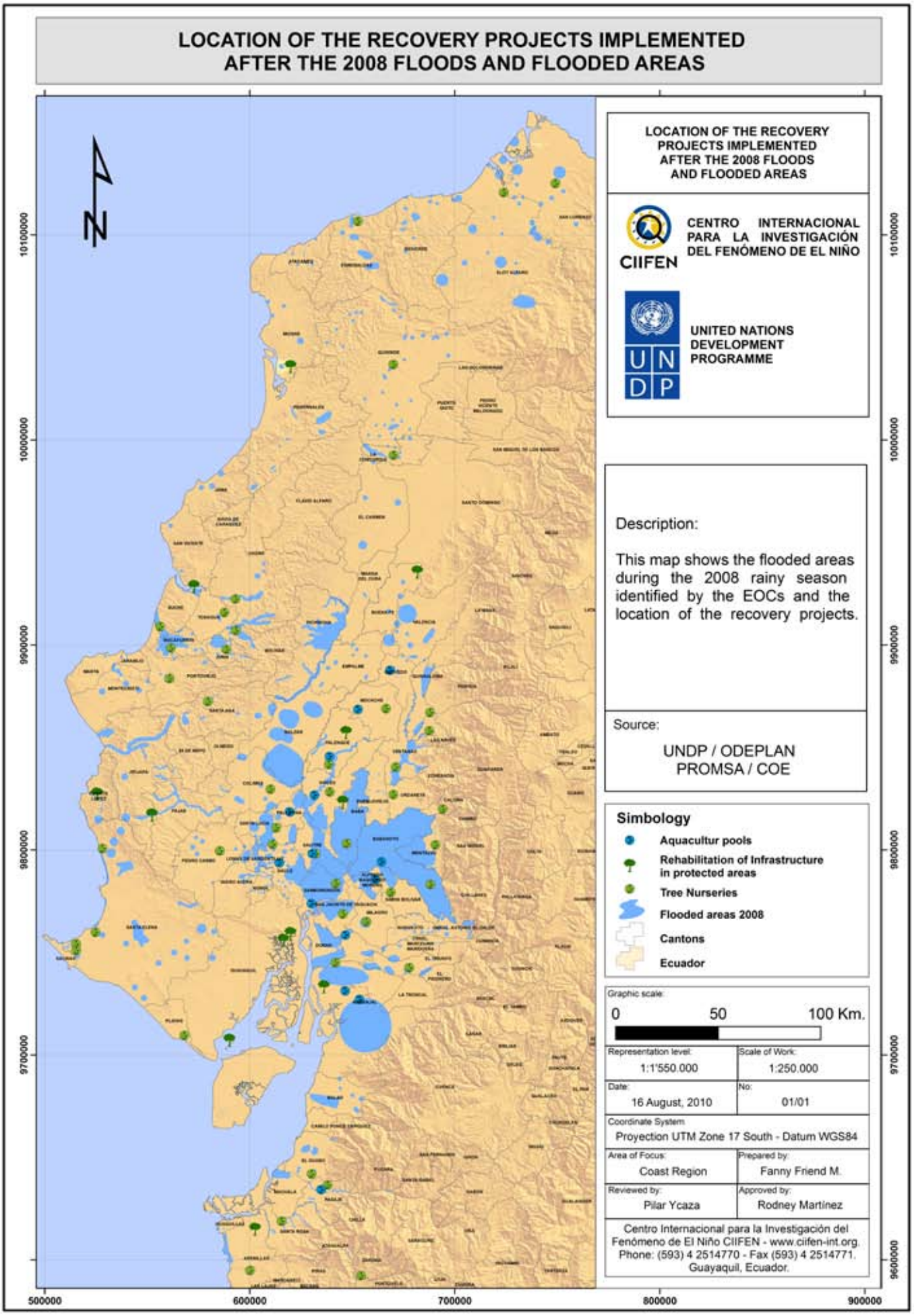
Another study (see Salomon, 2010) highlights the achievements of these projects with regard to the generation of employment and income; below is a table summarizing other relevant elements:

Project	Institution responsible	Financing	Interventions per province	Description	Products
Rural Aquaculture Pilot Project	Office of the Undersecretary of Aquaculture of the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP)	MAGAP: US$ 10,000 UNDP: US$ 50,000 ($34,000 were executed)	Los Ríos (10), Guayas (7)	Building of pools for fish farming; technical accompaniment and inputs to complete the first harvest	19 pools built and seeded in Guayas and Los Rios; spontaneous replication of the model; enriched water for irrigation.
Community Nurseries Project	Provincial Departments of the MAGAP	MAGAP: US$3,800,000 UNDP: $14,700	Los Ríos (11), Guayas & Santa Elena (16), Manabi (8), Esmeraldas (6), El Oro (5), Bolívar (2)	Building of nurseries and the propagation of plantlets to be distributed to farmers	50 nurseries of 2500 m2 each; 45 days of work given to those affected during the construction phase with 2165 temporary jobs; 250,000 plantlets per nursery.
Reconstruction of Infrastructure in Natural Protected Areas / ProCosta	Ministry of the Environment (MAE), Sub-secretariat of the Coastal Region, Partners of the Americas, FECD	MAE: around US$1,000,000 USAID (ProCosta Project): US$1,000,000	Guayas (1), Santa Elena (3), Manabí (4)	Rehabilitation of deteriorated infrastructure and reforestation in protected areas	Around 1,000 people employed temporarily, capacity-building

The only project that managed to carry out activities in most of the affected projects was the community nursery project; this project also created the most temporary jobs, with a significant expense for paying day laborers, which was absorbed by the national government. UNDP contributed technical assistance for monitoring the construction and functioning of the nurseries. The infrastructure reconstruction project also implied significant expense for paying temporary workers.

In the case of the pilot aquaculture project, the objectives were to guarantee food security and promote diversification in production; therefore, the funding was much less.

The attached map shows the location of the projects in relation to the flooded areas.


LOCATION OF THE RECOVERY PROJECTS IMPLEMENTED AFTER THE 2008 FLOODS AND FLOODED AREAS
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LOCATION OF THE RECOVERY PROJECTS IMPLEMENTED AFTER THE 2008 FLOODS AND FLOODED AREAS
CIIFEN
CENTRO INTERNACIONAL PARA LA INVESTIGACIÓN DEL FENÓMENO DE EL NIÑO
UNITED NATIONS DEVELOPMENT PROGRAMME
Description:
This map shows the flooded areas during the 2008 rainy season identified by the EOCs and the location of the recovery projects.
Source:
UNDP / ODEPLAN
PROMSA / COE
Simbology
Aquacultur pools
Rehabilitation of Infrastructure in protected areas
Tree Nurseries
Flooded areas 2008
Cantons
Ecuador
Graphic scale:
0
50
100 Km.
Representation level:
1:1'550.000
Scale of Work:
1:250.000
Date:
16 August, 2010
No:
01/01
Coordinate System:
Proyection UTM Zone 17 South - Datum WGS84
Area of Focus:
Coast Region
Prepared by:
Fanny Friend M.
Reviewed by:
Pilar Ycaza
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Guayaquil, Ecuador.

Pilot Rural Aquaculture Project

Background

This project was an initiative of the recently formed Aquaculture Sub-secretariat of the MAGAP (Ministry of Agriculture, Livestock, Aquaculture and Fisheries). Project activities started in May 2008. Its objective was to provide a production alternative to the people affected by the rainy season, through training and the transfer of technology in the form of fish farming techniques in rural areas that could be put into practice in a manner complementary to the usual economic activities. This would not only diversify the sources of income of the beneficiaries, but also make available a good source of protein at a low cost, contributing to the food security.

The project meant a change in the traditional focus of aquaculture in Ecuador, that traditionally was carried out in large shrimp farms, the objective of which is to produce large quantities of shrimp for export. The project also attempted to reverse the downward trend in local consumption of freshwater fish, that technicians say has occurred despite the fact that fish are an important ingredient of traditional dishes and local cuisine (Hill, 2010).

Implementation Mechanisms

Each beneficiary was to receive a donation consisting of the construction of a pool with a total capacity of 1000m^2 and measuring 25 x 40m, piping for the installation of the water outlet from the pool, fingerlings, enough food for a growing cycle of 6 months, a

Eye bird view of a flooded area in the coast, Photo: Borja Santos Porras, UNDP

mechanical scale and a net. The Sub-secretariat would provide technical assistance, periodic monitoring and training of the beneficiaries and other interested parties. A pool would be built, equipped and the fingerlings put in the water once, for a total of about $1,500.00 US dollars.

For the pilot, Tilapia (*Oreochromis sp.*) was used, a species of African origin cultivated in Ecuador since 1975; Chame (*Dormitator latifrons*), and white Pacu (*Piaractus brachypomus*), both native species. In the case of the Tilapia, sterile fish were provided so as to impede their reproduction, both to guarantee appropriate size and to limit their invasiveness.

The beneficiaries were selected based on information provided by the Sub-secretariat of Agriculture. They had to have small plots of land (up to 10Ha), with waterproof and uncontaminated ground, access to good quality water, a pump to fill the pool and the possibility to drain the pool water to adjacent fields. Efforts were made to select women, both to receive the donation and to receive the training. Where possible, the beneficiaries should be part of an association. An important qualitative element in the selection of the beneficiaries was their commitment, given that it meant starting a new activity, which meant assuming a certain amount of risk; they were also required to invite their neighbors and fellow association members to the training and play a multiplier role.

"…the beneficiary had to promise us two things: 1) obviously feed and care for the animals and 2) invite the community. The invited the community so that the community would attend the field schools and get trained, so that the experience would be replicated, with the beneficiary serving as the extensionist." (Pasquel, 2010)

Harvest, Sub-secretariat of Aquaculture- MAGAP

Each potential beneficiary received an inspection visit, during which the inspector would verify compliance with the above-mentioned conditions and fill in an environmental datasheet, identifying possible positive and negative impacts of the intervention. The compliance with these series of requirements, though it made beneficiary selection difficult, contributed to the success of the pool: *"85 or 90% of the people selected were affected* (by the floods). *The rest perhaps were not affected but were people in need of the help. That is to say, they were people who did not have money,* (but that) *had the will to work."* (Pasquel, 2010).

Once built, each pool was visited every two weeks by technicians and technicians of the Sub-secretariat. In the pools, Field Schools were organized, practical training workshops in which the beneficiary family participated, as well as their neighbors, members of their union and other interested parties. The training workshops covered all relevant subjects: site selection, building of the pools, acclimatization and planting of the species; samples and calculations of the food, disease and treatments, harvest and sales. The participants received educational materials and learned how to use the net and scale, the feeding charts, how to detect and identify diseases, etc. The idea was to motivate others interested in starting their own pools.

The harvest was done 6 months after the start of the crop. In the first harvest, the product of which belonged solely to the beneficiary, all the people trained throughout the farming cycle participated, as well as others interested in learning the procedure and buying the product. Post-pool production was at the expense of the beneficiary, whom the Sub-secretariat put into contact with suppliers of fingerlings and feed; the monitoring was then done bi-weekly.

Harvest, Sub-secretariat of Aquaculture- MAGAP

To support other interested famers who were not eligible to receive the donation, the Sub-secretariat signed an agreement with the National Development Bank (BNF for its initials in Spanish), according to which the Sub-secretariat granted a technical grade to those interested and whom could present this to obtain a loan from the BNF (Hill, 2010; Pasquel, 2010).

Project Results

Between August 2008 and July 2009, 19 pools were built in Guayas (10) and Los Rios (9) provinces. 11 pools were built in 2008 and 7 in 2009; 18 pools reached the first harvest. In the field schools, 660 people were trained, 200 of which were women. Of the beneficiaries only two owners are women, however, the technicians reported that many wives actively participated in the training workshops and have taken on the responsibility of caring for the pools and of the sale of the product. (Hill, staff memo 2010; Paquel, staff memo 2010).

The construction did not generate new employment; the pools were built using heavy machinery in about 12 to 14 hours, because it was not feasible to do it manually (Pasquel, 2010). During the land preparation and the harvest, the beneficiaries asked for help from their neighbors and family and paid them with fish. The operation of the pools did not require supplementary labor either.

Most of the pools (13, or 74%) were started with Tilapia; three, with Chamama; one, Chame and others with Chame and Tilapia. The beneficiaries preferred to receive Tilapia despite that it is an alien species and has invasive potential[6], given that it is widely consumed and the producers know and prefer it to Cachama and Chame. The technicians of the Sub-secretariat trust that these market preferences can be modified once more is known about the other species: *"The current consumption of Tilapia is very large and it is an export item. Everyone wants to do fish farming with Tilapia, that is the reality….When we make them try the Cachama meat, they are convinced. The Cachama is well known and has a good price in Los Rios, where they pay up to $2 per pound. We want to replace the Tilapia, but we need to conscious of the reality of the people."* (Hill, 2010).

The first harvest occurred, on average, after 6 months; all but one pool was harvested, in which the fish were lost due to a rupture in the pool wall. Not having to deduct the building or equipment of the pool, all profit from the first harvest went to the producers. The profit was very variable, but never negative.

Below is a summary of the location of the pools that reached the fist harvest and their production:

6 The suppliers guaranteed that the fish would only be male, but in practice reproduction occurred in at least three pools.

Province	Canton / place	Survival rate (%)	Total Harvest (pounds)	Potential Profit @ 0.9 USD/lb
Guayas	Bajada de Progreso	72%	336.60	302.94
Guayas	Daule	92%	567.64	510.88
Guayas	El Mango	118%	578.50	520.65
Guayas	Jujan	82%	231.51	208.36
Guayas	Palestina	48%	704.88	634.39
Guayas	Salitre	109%	251.24	226.12
Guayas	Samborondón	38%	1316.88	1185.19
Guayas	Samborondón	58%	1161.95	1045.76
Guayas	Taura	71%	2045.58	1841.02
Guayas	Yaguachi	86%	506.99	456.29
Los Ríos	Guarumal	81%	1592.10	1432.89
Los Ríos	Babahoyo	118%	1118.17	1006.35
Los Ríos	Babahoyo	73%	1697.16	1527.44
Los Ríos	Palenque	21%	1029.00	926.10
Los Ríos	Quevedo	22%	196.61	176.95
Los Ríos	Vinces	24%	1622.00	1459.80
	AVERAGE	**67%**	**964.75**	**868.28**

The large variation in production depends on, according to the Sub-secretariat, the commitment and care of the producers, their compliance with technical standards and their close relationship with the professionals who advise them. Their affection for the activity can be seen in the words of Mr. Galo Alcivar, owner of a pool in Jujan: *"Because if the water level of the pool is very low, I have to switch on the pump, I have to fill it with water, even if it means getting up really early, to make sure there is clean water, so that the fish are happy, wise and in good taste…I like things properly done, few things, but properly done, poor but very organized."* (Alcivar, 2010).

As an additional benefit, the water taken from the pools as part of its normal management, has fertilizing properties and could be used by the farmers for their other crops.

Sustainability and risks

Already during the execution of the pilot project it was evident that other producers were interested in installing pools on their properties; some who had abandoned the activity years before due to high input costs[7], wanted to return, and the same beneficiaries wanted to build more pools to increase their production (Alcivar, 2010). The initial costs are high, around $1,500 for each new pool; the existence of a credit line specifically for this from the Development Bank helps overcome this barrier. The Sub-secretariat of Aquaculture calculates that with loans from the Bank, 50 pools in the Coast and 70 in the Amazon were built (Hill, 2010).

However, the system should be improved; the constant change of branch managers prevents the Bank from helping the applicants in a timely manner (Pasquel, 2010). Furthermore the application is still excessive and complicated for farmers who, whilst trying to avoid loan sharks, are struggling to deal with bureaucratic requirements. As indicated by one beneficiary: "*I was going to apply for credit in the Development Bank so as not to go to those sharks who take your money. They told me to get a whole lot of papers that I was never going to be able to put together….I had to go to the Sub-secretariat to get the papers, the lands, the pools, I had to get copies in the Land Registry, everything was a problem and it took like a month. (better) I asked for money from a coop in Guayaquil for clearing the land and for rice and used that money."* (Alcivar, 2010)

In addition to the cost of the fingerlings, the food can represent up to 50% of the cost of production. The Sub-secretariat plans to develop a "homemade" balanced food that producers could produce themselves. (Hill, 2010).

As this is a relatively new activity, the training efforts to guarantee the success of the production and its sustainability are crucial. To manage this risk, during the pilot project 4 courses of expansion were organized in which agricultural technicians from various ministries and organizations (MAGAP, MIES, MIPRO, ex CDG) and post graduate students participated. The project marked a milestone in the job orientation of the professionals of the Sub-secretariat of Aquaculture; in the words of the ex Minister of the Coast:*"…*

Pool, Sub-secretariat of Aquaculture- MAGAP

7 The Sub-secretariat of Aquaculture started a record of all the pools in the country; they estimate that between 7000 and 8000 producers, with pools of various size and management (from 70 to 1 000m3; from 5 to 1.5 fish per cubic meter) of which the majority use for their own consumption.

the aquaculture professionals were traditionally very linked to the activities of export companies …and had a vision very much that of the corporate shrimp export sector…. from this experience I find that there has been a change and that the people of the Sub-secretariat have found a way to be of public service to the most poor people and who in turn are the most affected by natural disasters." (Portaluppi, 2010).

Being located in areas susceptible to flooding, the pools could be affected in future rainy seasons. To alleviate this risk, locations that according to their owners flood less often, were chosen. The construction contemplates an overflow of water with grids, so that the excess water can drain; the walls are compact and high which allow for them to resist at least the regular seasons. Furthermore, the producers intend to use the pumps to drain excess water if necessary (Alcivar, 2010). If an unusually rainy season occurs, the pools could be affected; but this risk has not been quantified.

Could the experience be replicated as a means to restore livelihoods in the case of a new natural disaster? According to the organizers, the start-up would be quicker as the areas of higher impact and the interested farmers have been identified; they also know how to organize the process and a group of technicians capable of providing the necessary assistance exists. The biggest problem would be to generate the necessary funds and to wait for the rain to decrease to be able to build the pools.

In normal circumstances, outside of a disaster situation, the Sub-secretariat plans to extend the rural aquaculture to the rest of the coastal provinces, within the National Aquaculture Development Program framework – the laboratory in Babahoyo is part of this effort. However, the SENPLADES have prioritized these activities in the Esmeraldas, Manabí and El Oro provinces but not for Guayas and Los Rios. The support of MIES has been requested to add more producers to the activity, to increase production and facilitate better sale conditions (Pasquel, 2010).

As for negative environmental impacts, various precautions were taken: The fingerlings, specie of African origin potentially invasive, were all male to prevent their reproduction both in the pools as well as out of, in the event that they were able to escape. Neither antibiotics nor pesticides were used in the treatment of the water; therefore, the water could be used for irrigation without affecting the other crops.

No numbers exist to estimate the importance of this additional income in the economy of the producers; those interviewed stated that the impact is positive (Hill, Pasquel, Alcivar, 2010). Up until October 2001, that is to say two and a half years after the project was started, 10 of the original 18 producers have put fingerlings in their pools again.

Community Tree Nurseries Project

Background

The project aimed at benefiting people affected by floods by creating temporary employment in the construction and operation of forestry nurseries. Its general objective was to "*alleviate the loss of income of the farmers affected by the rain of 2008, preferably benefiting the heads of families residing in flooded areas."* Its specific objectives were to create temporary and permanent jobs, restore crops of perennial species that were affected by the floods and supply native plants to the Forestation and Reforestation Program (PROFORESTAL) of the MAGAP (Ministry of Agriculture, Livestock, Aquaculture and Fisheries), which proposes an ambitious effort of reforestation for the next 30 years.

The idea for the project arose at the Productivity and Livelihoods Support working group. It was considered that even though it was not possible to work directly with agricultural activities in the flooded areas, one could make the use of relatively small plots of dry areas (around 2,500 to 3,000m) to grow plantlets that later could serve to replace the plants lost in the flood.

The potential creation of temporary jobs for these nurseries is very high, not so much due to the amount of people needed for the construction, but rather because a lot of unskilled labor is required to prepare the soil, fill the plastic bags with this soil and plant the seeds of the chosen species.

Additionally, the delivery of forestry species (in addition to fruit trees, which can produce more quickly) could help encourage the planting of those species, especially on small properties, and in the reforestation of areas characterized by the degradation of the soil and erosion (Velez, interview and workshop, 2010; Rivadeneira, 2009 Report).



Nurseries, Photo: Alexis Rivadeneira, 2010

Implementation mechanisms

The MAGAP was to be responsible for leading the execution of the project. According to their specifications, each nursery had to have an area of 2,550m^2, a saran cover, an irrigation system and a building structure that could serve as an office and storeroom. The nurseries would be built on land owned by a formal organization of farmers, academic institutions or an NGO, and an agreement was signed for its use for three years. Once built, the nursery becomes property of the organization or community. In each nursery 250,000 plants of different species would be grown, depending on the interest of the beneficiary community.

During the first phase (construction and filling of the bags) the plan was to employ around 2500 people for two months; each receiving a wage of $200 per month. During the second and third phases (management and delivery) 500 people were employed for 4 months. About 60% of the people employed had to be women -- "*mothers, who carry out subsistence activities, from low income groups"; and 40% fathers of families affected by the apparent scarce supply of farming jobs or whose lands were lost by the effects of the rain, of low income."* The estimated budget for each nursery was $65,000.

The construction of each nursery was carried out by a contractor in a period of around 45 days. The subsequent management included the filling of the plastic bags with soil, the planting of the seeds to be propagated and the care of the plants; the work of the day laborers was to be supervised by a manager and nursery owner. The plants, ready in about 180 days, would be delivered free of charge to the land of the beneficiaries, identified by the MAGAP and the organizers in charge of the nurseries. The MAGAP technicians were in charge of following up the handling of the plants produced and delivered by the project. It was hoped that 100,000 families would benefit from the propagated plants.

With funds from the UNDP (United Nations Development Program) a Forestry Engineer was hired to accompany the process. He carried out periodic visits to all the nurseries to verify the progress of the work and activities, collect information on the amount of labor used and its origin and submit weekly and monthly reports to the Monitoring Committee made up of one representative from MAGAP and another from the Ministry of the Coast. He also offered technical assistance on how to adjust certain technical details such as the area of the nurseries, the species to plant, modification to the storerooms, the quality of the materials to propagate, improvements to the management of the nursery and recommendation for the training of the employed farmers.

It was hoped that after the end of the project, once the nursery was managed directly by the associations or communities owners of the land, it could be useful for other rural development programs. The infrastructure could be used to continue propagating plants, technology transfer and centers to stockpile: "*We would like for these nurseries to become State policy, that each year the nurseries grow plants, that the people are always actively producing plants, that the people know they can go and find the plants. That the people of the Development Bank know that the plants come from this initiative, that the*

plants grafted are from selected varieties. For this the communities are going to need stable and secure financing because the profit is no more than 40% of the investment." (Velez, 2010).

Project results

The project was described in a document that contained the main guidelines for its implementation; it did not give detailed directions on how to exercise financial management; procurement guidelines or design elements for the nurseries. Each Area Technical Manager (DTA for their initials in Spanish) from MAGAP drew up his plan of execution, in which some forms of contracting and construction were presented.

The construction of the nurseries started in August 2008 and finished around February 2009. Plants were delivered until May 2009. The process suffered delays in some provinces due to the difficulties caused by changes in budget lines and account consolidation authorizations, as the Ministry of Finance was in charge of those processes. In other cases, there were legal difficulties in finalizing the agreement with the associations who owned the land, finally, the construction of some nurseries was delayed due to the start of the rainy season at the beginning of 2009.

In total, 46 nurseries in 7 affected provinces were built, according to the following chart:

Province	Number of nurseries
Esmeraldas	4
Manabí	8
Guayas	12
Santa Elena	4
Los Ríos	11
El Oro	5
Bolívar	2
Total	**46**

The farmers hired to participate in the development of the nurseries were expected to receive training on how to manage these facilities and on cultural practices, but this did not happen. The DTA of Los Rios sent 5 farmers to receive training in cacao grafting at the Pichilingue Experimental Station of the INIAP, but with their limited experience they did not reach the levels of expertise that they needed to work with the contractor for the grafting of cacao plants.

With regards to the creation of employment, during the construction and management of the nurseries the contractors preferred to hire crews of known laborers, not necessarily residents of the affected areas. Some farmers from the area were hired to fill the bags and put them inside the nurseries.

The production volumes in Guayas, El Oro and Santa Elena were less than expected and two nurseries planned for were not installed in Cañar due to operational difficulties. Among the timber species cultivated were Teak, Cedar and Balsa. The fruit trees and others included African Palm (bought from industrial greenhouses to distribute in San Lorenzo, Esmeraldas), Cacao, Passion Fruit, Citrus, Coconut, Banana, Coffee, Papaya, Guava, Sugar Cane, Mango, Tree Tomato and Granadilla. The selection of which plants to grow depended on the existence of seeds and of the criteria of the Agricultural Directorates of each province according to the needs of the farmers; for this reason in Esmeraldas African Palm plantlets were bought whereas in other provinces, coffee and cacao.

There were problems in stocking the plants, especially the native timber species, as not all the species produce seeds when the sowing began. (Note that this problem did not occur in protected areas run by the MAE, who obtained plants from the Provincial Council of Manabí).

At the instruction of MAGAP, each beneficiary received 500 plants and not the 100 originally planned for, so that the number of beneficiaries of the plants decreased considerably.

In the case of cacao, the produced plants contributed to replace 50% of the 5,500 hectares lost during the winter (Velez, 2010).

Current situation of a nursery, Photo: Cecilia Falconí, 2010

The results can be summarized as follows:

Parameter	Expected	Actual
Plants produced	11,500,000	8,675,000 (75%)
Temporary job positions created	2000	1785 (89%)
Permanent job positions created	500	380
Women employed	60% of the total	50%
Plants given to each beneficiary (plants were not delivered to Proforestal)	100	500
Number of beneficiaries of plants	100,000	15,000 (15%)

Sustainability and vulnerability of the project

Once the funding to hire day laborers and to buy supplies for maintenance, seeds and plantlets ended, the activity of the nurseries decreased significantly. Only those in the hands of educational institutions are active (the Juan Jose Castelo Foundation, for example). The lack of funds would be the main obstacle to achieve the continuous operation of the nurseries.

Due to differences in approaches within the MAGAP, no link with Proferestal was established so that this program could obtain plantlets produced in these nurseries (Portaluppi, Velez, 2010). With regards to the possibility of selling the plantlets to farmers interested in growing them, the MAGAP decided not to do so, arguing that there was no tradition of cultivating forestry species among small farmers and that they do not have an incentive to buy these types of trees, so, they were given only a mix of fruit and timber trees (in general around 30% of forestry species) to encourage them to experiment with these crops (Velez, 2010). In conclusion no mechanism was established to be able to keep the nurseries operational to supply local or regional demand, whether from public companies or private buyers.

When deciding on the location of the nurseries, areas less susceptible to flooding and those closer to highways, that had an irrigation system and electricity were chosen; after which they would have to overcome legal problems, prove ownership of the land and infrastructure to be installed, etc. All this conspired against the rapid development of the project and could have kept the nurseries away from the populations most affected by the floods and therefore where the need for temporal employment most existed.

In terms of its usefulness for the creation of temporary employment after disasters, the nurseries already built could enter into intensive phases of plant production, employing the disaster victims, as well as linking themselves to parallel reforestation efforts; the inter and intra-institutional coordination mechanisms and agreements should be made clear before the contingency to facilitate the rapid creation of markets for the production of the nurseries.

In any case it is evident that the nurseries could represent an important contribution to overcome the base vulnerability of the rural areas of the Coast: limited diversification of agricultural production, deforestation and degradation of the soil, the need to develop capacities to cultivate forestry and fruit species, etc. Furthermore, one unexpected benefit from the project was the re-establishment of ties of trust and team work between the MAGAP technicians and the farmers where the nurseries were operating and who received plantlets.

Location of the community nurseries in each province

Province – canton/parish/location	Associated institution
Los Rios (11)	
1. Babahoyo	Febres Cordero Women's Front
2. Baba:.Arenillas	Canton Agricultural Center
3. Baba: Cañaveral	Las Mercedes Association of Agriculture Workers
4. Baba: El Tillo	El Tillo Montubia Association
5. Mocache: Mango Azul	Nueva Esperanza Rural Association
6. Montalvo: La Esmeralda	Buscando Futuro Association of Agricultural Producers
7. Palenque: La Saiba	La Saiba Rural Association
8. Quinsaloma: El Guabito	1 de Noviembre Agricultural Producers Association
9. Urdaneta: Catarama	Catarama Rural Association
10. Ventanas: El Descanso	Tierra Fertil Provincial Federation of Community Organizations
11. Vinces:	Vinces Technical Agricultural Institute
Guayas y Santa Elena (16)	
1. Pedro Carbo, Valle de la Virgen	Passailaigue High School
2. Daule	Galo Plaza Lasso Agricultural High Schools
3. Yaguachi	El Boliche Station, INIAP
4. Playas.	Rashid Torbay National High School
5. El Naranjal Nursery, El Paraíso District, Taura Parish	La Unión Association of Agricultural Producers
6. Santa Lucia:	Santa Lucía Cantonal Agriculture Association
7. El Triunfo	Association of Cane Farmers of Ecuador
8. Milagro:	Agrarian University of Ecuador
9. Salitre:	Municipality of Salitre
10. Simón Bolívar	Agricultural Center of Simon Bolivar
11. Samborondón	Samborondón Public High School
12. Colimes	Caminando Hacia El Futuro Foundation

Province – canton/parish/location	Associated institution
13. Santa Elena: Atahualpa	Fundeco Foundation
14. Santa Elena: Olon	Remigio Crespo Toral High School
15. Santa Elena: Loma Alta	Loma Alta Community
16. Santa Elena: Limoncito	Juan José Casteló Foundation
Manabi (8)	
1. Sucre: San Roque, Charapotó	San Roque Community
2. Rocafuerte: San Eloy site	Association of Rice Farmers and Merchants
3. Portoviejo: Alajuela site	Alajuela National Technical High School
4. Santa Ana: Ayacucho, Sitio Faustino	Association of Cacao Producers
5. Chone: San Antonio, Bravo Chico site	Ciro Dueñas Andrade Community
6. Tosagua: Bachillero, Monteoscuro site	Association of Autonomous Workers
7. Bolívar: Km 1 on the Junín-Calceta highway	
8. Junín: Sitio: Las Piedras	Union of Women Yucca Farmers and Processors
Esmeraldas (6)	
1. La Concordia	UT Esmeraldas Vargas Torres
2. Quinindé: Rosa Zárate Parish	Quininde Superior Agriculture Institute
3. Tachina Parish	Tachina Technical Agricultural School
4. Borbón, ex Eloy Alfaro	Muisne: Nueva Esperanza Association of Rural Women
5. San Lorenzo: Carondelet	Plants were purchased from Energy Palm to plant directly in the fields of the farmers
El Oro (5)	
1. Pasaje: Progreso site	
2. El Guabo: Río Chico site	Garrido Pre-Association of Small Farmers
3. Santa Rosa: Santa Rosa site	Emerenciana Nursery, Bolivarian Association of cacao and short cycle producers
4. Arenillas: Palmales site	
5. Zaruma: Zaruma site	Betty Carrión, Nuestra Señora del Carmen Foundation
Bolívar (2)	
Caluma: San Pablo de Pita	Social Development Association
Las Naves canton	Agrodosmil Association

Pro Costa Project: "Improving Ecuador´s Coastal Protected Areas and Buffer Zones through Short-Term Employment of Flooding Victims" and

Infrastructure Reconstruction Project - Ministry of the Environment

Background

These two projects were designed simultaneously, in early 2008, with similar overall objectives: to rebuild the infrastructure of protected areas of the coast which suffered damages during the rainy season, thus creating short-term jobs. The construction projects employed people from the communities where the work was done, who had been affected by the flooding. However, there were significant variations in their planning and implementation.

The Pro Costa project

The Pro Costa project was funded by USAID and implemented by Partners of the Americas, the Americas Foundation and the Ecuadorian Cooperation for Development Trust (FECD), with the cooperation of the Provincial Council of Manabi. The national government participated through the Coastal Marine Sub-secretariat of the Ministry of the Environment, which approved the operational plan and contributed to the organization of the activities within the protected areas.

The project was implemented between August 2008 and December 2009 in 9 coastal communities that were within or in the area of influence of protected areas affected by flooding in the provinces of Manabi, Santa Elena and Guayas.

Reforestation, MAE

Below are the 9 places where the intervention took place:

Province	Protected Area
Guayas	El Morro Wildlife Reserve
Santa Elena	Loma Alta, Alta
	Salanguillo
	Dos Mangas
Manabi	Agua Blanca, Los Frailes, Puerto López (Machalilla National Park)
	Comuna El Pital
	Upper Portoviejo River basin
	La Segua wetlands

All of the interventions contains three elements: the reconstruction of infrastructure, training of park guards or naturalist guides related to tourism activities in the protected areas, and the reforestation of river basins with native species. The importance of each element varied depending on the problems found and the priorities set by each community (see below). The project also implemented a novel strategy to train the residents of the areas of influence of the protected areas: the Conservation Corps, a methodology employed in Central America which consists of concentrating people living in high-risk areas in camps, where in addition to teaching them how to organize the operations of the camp and asking them to follow a series of rules, they are offered educational sessions on disaster prevention and other pending environmental issues: watershed conservation, water management and solid waste management. In addition, mini-projects are carried out to help better manage the environmental and sanitary problems of the population, like trash containers, ditch cleaning, etc.

Implementation

During 2008, an assessment was carried out to determine the zones, plan and prioritize the interventions with the participation of the local communities: *"In the first assessments, a brainstorming was done on all of the things that could be done, and then information-sharing activities were carried out in each of the 9 sites to gather the points of view of the local communities, in terms of what they feel are the priorities; then, after the priority-setting meetings, we were able to have a defined operational plan that reflected what the people really needed."* (Chavez, 2010).

Infrastructure Reconstruction: In addition to creating temporary jobs, an attempt was made to rehabilitate basic infrastructure for the communities or infrastructure that could be used for income-generating tourism activities. In the words of Juan Chavez, "the goal of the project is to provide short-term jobs for various communities that were affected by this winter season, by reconstructing infrastructure that could serve to improve their living conditions or for businesses that could earn more money….for example building a bathroom in a public place where the problem of human waste is severe, like in the Poza

Honda area, in order to improve the quality of life in those communities, or for example in Loma Alta, to rebuild a community tourism lodging facility that was completely run-down." (Chavez, 2010).

The contractors, selected in a competitive process as mandated by Ecuadorian law, were obligated to hire local manpower unless they needed expert workers.

Reforestation: The reforestation began in early 2009, to take advantage of the rainy season; the previous months were dedicated to collecting seeds and producing plantlets in nurseries of the Provincial Council of Manabi and private nurseries in Guayas and Santa Elena. For the reforestation work, $150 was paid to each day laborer. In the first phase, after confirming that the land had been properly prepared, the plants were distributed to them; when it was confirmed that the plants had been planted, they were paid 75 dollars. Then they had to take care of the plants, replace any that didn't take root and clean the base of the plants when the rainy season was over. The other 75 dollars were paid when the promoters verified that the plants had sprouted and were healthy.

At the same time, rules were established with respect to the reforestation: the project would not fund the clearing of native forests to plant tree species and native species would be planted. The residents chose the species from a list of those available. In addition to the Provincial Council of Manabi, plants were acquired in Guayas and Santa Elena. The trees were planted "*as is natural at different distances, interspersed among each other…"* (Chavez, 2010).

Conservation corps: The camps of the conservation corps were not job creation initiatives; rather they were spaces for the residents of protected areas or their areas of influence. Each camp contained between 40 to 70 people and they were organized in different places, under tough conditions and with military-like discipline. Around 40% of the participants were women, who even brought their small children. Each camp was announced by the local promoters going door-to-door, and applicants to attend the camps had to fill out a questionnaire which included questions about their health status, allergies, etc. During the camp, community work activities were combined with education, environmental activities and recreation the attendees organized themselves into squads into which the work was divided in each camp. For this activity, compensation was only



Infraestructure reconstruction, reforestation and conservation bodies - MAE

paid to the promoters and the squad leaders, who were responsible for the logistics of their group.

It was not evaluated whether or not this activity had produced any change in behavior of the campers.

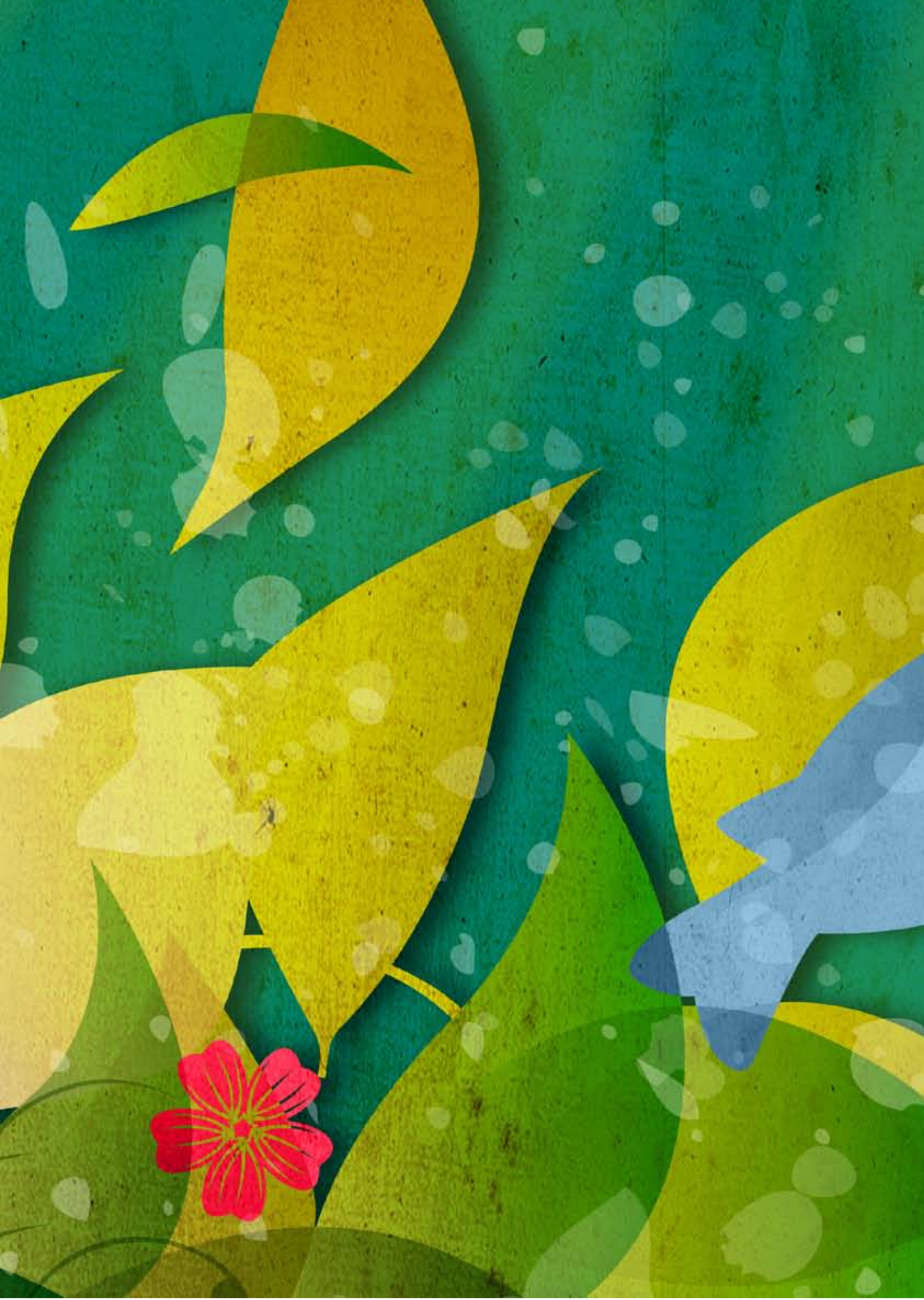
The greatest difficulties were caused by the large distances between sites, from the central mountains of Manabi to the Gulf of Guayaquil, which made for long trips and made it difficult to monitor and verify the progress of the works. The project decided to hire an overseer for the Manabi area, and another for Guayas and Santa Elena, but in any case, oversight was difficult. It was also a challenge to organize the logistics for the conservation corps.

Results

The project supported the reforestation of 400 hectares, most of which (300) located in the Portoviejo River basin, with native species endemic to the dry and rain forests of the Ecuadorian coast. At least 682 local people participated in the reforestation work, 269 of which received monetary incentives from the project for planting the plants. In addition, seven Conservation Corps camps were set up in different areas of the Province of Manabi which involved around 200 people. Through the project, in addition, 56 nature guides from three protected areas or buffer zones were trained so that they could better perform their jobs, and 74 park rangers from Santa Elena and Guayas were trained on forest fire prevention and geographic positioning systems.

As far as female participation goes, it varied depending on the type of activity. Women accompanied their husbands in the reforestation but did not get involved in infrastructure reconstruction and rehabilitation, since these tasks are not traditionally done by women on the coast.

Training and Capacity building - MAE



Infrastructure reconstruction project - Ministry of the Environment (MAE)

This project was designed by the MAE in the context of the working groups organized by the Ministry of the Coast and financed with funds from the Ministry of Finance. It began and ended in 2008. Its objective was to rebuild infrastructure that had already been deteriorated and which suffered significant damage during the rainy months. In addition, the project build structures to facilitate community tourism activities and carried out reforestation work. Below is a table describing the 22 interventions:

Province	Protected Area	Intervention
Manabí, Puerto López Canton	Machalilla National Park	Reconstruction and repair of internal roads
		Recuperation of the plant cover in the riverbeds of the Salaite, El Pital, Los Punteros, Pueblo Nuevo, Río Seco, Las Pampas, Piñas and Buenavista Rivers
Manabí, Sucre Canton	Isla Corazon Wildlife Reserve and Isla Fragatas	Reforestation of the mangrove
		Reconstruction and rehabilitation of the self-guided trail
Esmeraldas (cantons of Esmeraldas, Atacames, Quinindé, Muisne); Manabí (Pedernales Canton)	Mache Chindul Reserve	Restoring plant cover in the beds of the Cuaque, Tachina, Coasa and Cheve Rivers.
		Protection of slopes through reforestation along the Pedernales – Esmeraldas highway in the communities of Vite, Eloy Alfaro, Cheve and Chindul
		Sustainable productive projects aimed at families living within the reserve: workshops for craftspeople working with tagua and guadua cane; small household projects for raising domestic animals and ecotourism proejcts
Guayas	Manglares Churute Reserve	Reconstruction and rehabilitation of walking paths, a parking area
		Reconstruction and rehabilitation of the internal roads of the reserve and local communities (El Mirador, La Flora)
		Recovery of vegetation coverage through the planting of native species along the edges of the reserve

Province	Protected Area	Intervention
	Abras de Mantequilla Wetlands	Recuperation of the plant coverage on the edges of the micro-basins of the Vinces River
		Recovery of plant coverage on the edges of rivers with the planting of native species
		Reconstruction and rehabilitation of the road located 1 km from the Vinces highway via Quevedo, leading to the El Recuerdo community and Km 10 of the Pechinche community road
		Protection of slopes via reforestation
Santa Elena	Chongón-Colonche Protective Forest	Sustainable productive incentives: agriculture, forestation and animal raising
		Reconstruction and rehabilitation of internal roads, San Vicente – Rio Blanco, Julio Moreno-Bella Vista del Cerro, Loma Alta-El Suspiro, Manglaralto-Dos Mangas
Los Ríos, Valencia Canton, Patricia Pilar parish	Palenque River Protective Forest	Reforestation of the forest with native species: selection of seed trees for identification and conservation, collection of seeds.
Los Ríos, Palenque Canton	Jauneche Protective Forest	Repair and reconstruction of two guard huts.
Guayas, Guayas Canton	El Morro Reserve, El Salado and Arenillas	Reconstruction and rehabilitation of walkways of the four areas
		Reconstruction of interpretation centers
Guayas, Guayas canton (within the city of Guayaquil)	El Paraiso Protective Forest (San Eduardo Sector)	Recovery of plant coverage
		Construction of outlet canals in the southern sector of the

Results

In the Ministry of the Environment (MAE), no reports were found on the final results of the works nor on how many people, by gender, were employed in each of them. In the texts of the contracts signed with the executors of each work, there was a clause that specified the obligation to hire local workers unless experts were required.

Sustainability and risks for both projects

All of the activities undertaken were successful in creating temporary employment. In terms of the future uses of the infrastructure for tourism activities, its sustainability depends that it can be used to generate income for interested residents; this in many cases requires training the community in tourism commercialization, visitor management and other activities. Ideally the infrastructure can be connected with already identified needs (for example, the case of the touristic port of El Morro, which was an already existing demand from before the flood season) or with projects to build capacities, promote and market tourism, like those implemented by the Coastal Resources Management Program (PMRC) in the La Segua wetlands.

Rehabilitation of turistic infrastructure and reforestation of mangro - MAE

The eruption of the Tungurahua: recovery in the midst of volcanic activity

Background

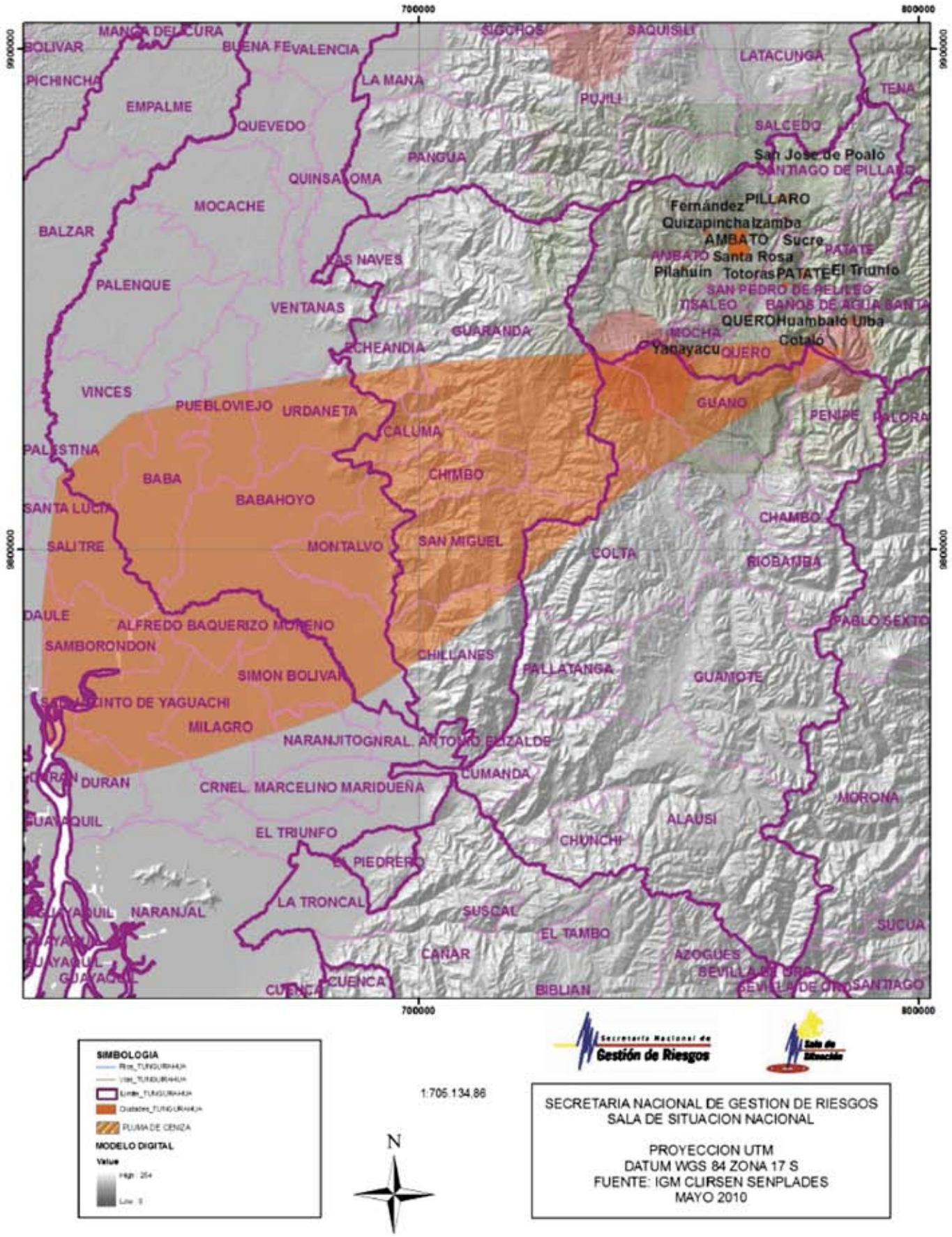
The Tungurahua volcano (5,023 masl) is located over the massifs of the central Ecuadorian mountain range, 35 kilometers southeast of the city of Ambato, 30 kilometers from Riobamba and 150 kilometers southeast of Quito. In its foothills is the city of Baños de Agua Santa and 60% of the volcanic edifice is located in the Province of Chimborazo.

The volcano is one of the most active in Ecuador; there are historical records of eruptions in 1641, 1773, 1886 and 1916-1918. In 1999, the volcano began a new eruptive process, which has stretched out to the present day, with significant exacerbations in 2001, 2003, 2006, 2008 and 2010. The results of the eruptions (pyroclastic and mud flows, ash, small flows of lava and tuffs) have affected the provinces of Tungurahua, Chimborazo and Bolivar. In the province of Tungurahua, the most affected cantons have been Quero, Pelileo, Tisaleo, Mocha, Cevallos and sectors of Juive Grande and Pondoa in the Baños canton.

The ash (as an example, see the map of its distribution in the 2010 exacerbation, attached) has grave impacts on the health of people, their houses and on production: it suffocates crops, pollutes and obstructs water reservoirs and deteriorates pastures for grazing. The continual fall of ash produces a prolonged crisis that steadily increases the vulnerability of those affected; both the governmental response as well as humanitarian aid efforts were focused on alleviating the immediate impacts of each event, by distributing food, water and medicine for people and animals; helping to evacuate people where necessary; setting up shelters and addressing the problems of displaced people.

Shoe factory, Cantón Cevallos, Photo: Cecilia Falconí

TUNGURAHUA VOLCANO: ASH PLUME



Gradually, proposals emerged that aimed at reducing the vulnerability of the population, seeking more structural solutions. In the specific case of UNDP, its actions in this sense began around the year 2003 with an initial project implemented by the Italian NGO COOPI, which focused on diversifying production and adopting appropriate technologies to address each fall of ash in the cantons of Quero, Cevallos and Tisaleo.

In 2006, the most serious flare-up occurred since the re-start of volcanic activity – damages totaled approximately $67 million. As part of the response efforts, the Technical Secretariat of the Social Front (STFS) [8], with support from UNDP/BCPR, produced the Policy Guidelines for the Process of Recovery and Sustainable Social Development in the Area of Influence of the Tungurahua Volcano. According to this document, "*The guidelines are general policy pronouncements and the starting point for a more detailed process of public planning and management that will be done at a later point and that will be based on a strategic recovery plan and specific sectoral, provincial or canton plans, as determined by the government and territorial authorities.*"

The document presented five themes around which the response, and later the recovery, should be organized: awareness of threats, territorial planning and capacity-building; security and preparation for the response; and corporate social responsibility. The intention was, by taking action related to each theme, to generate the conditions to transition from the response phase "to a full recovery and sustainable development phase." The entire process was to be led by the STFS and the specific aspects of each theme were assigned to the appropriate sectoral ministries. It was estimated that the entire plan would cost around US$43 million.

The proposal was never officially instituted; one year later the country chose a new president and the process of institutional transition of risk management began, as part of the profound reform of the State that is underway in the country. In any case, the document reveals the thinking and debate that existed around risk management and recovery. Undoubtedly, these advances would later be expressed in the organization of the Technical Risk Management Secretariat and would inspire many of the strategies implemented during the 2008 floods.

Implementation

In contrast to the other experiences described in this document, the experience of the Cevallos canton in Tungurahua province is one of transformation and diversification of productive activities, among a population that suffers the chronic effects of the prolonged eruption process of the Tungurahua volcano.

In the particular case of Cevallos, the greatest impact that the canton experiences is the fall of ash, which has reached sufficient intensity to seriously affect agricultural production and the daily life of its inhabitants.

8 Institutional predecessor of the current National Secretariat for Risk Management (SNGR).

Cevallos is the smallest and most recently formed canton in the province of Tungurahua, created in 1986 and with a current estimated population of 8,239 residents, of which most (60%) live in rural areas[9]. It is at the southern end of the province, 14 kilometers from the provincial capital of Ambato and 18 kilometers from the mouth of the volcano. The climate here is temperate, and the altitude varies from 2800 to 3100 meters above sea level, with an average temperature of 14 - 15°C and precipitation of 659 mm per year. The canton has around 30 neighborhoods and caserios dispersed around a small urban nucleus. Because of its location, the only eruption impact that it suffers from is the fall of ash.

The traditional economic activity of the canton was fruit farming; the people grew produce and raised animals in a precarious manner, what the technical staff of the municipality called the "economy of the backyard" (Paña, 2009). According to municipal officials, 40% of the national production of apples, pears, claudias and peaches come from the province of Tungurahua; of that amount, 20% comes from Cevallos. Until the end of the 1990s, this region even exported its products to Colombia. When the importation of fruits from Chile and the United States was permitted, the local economy began to decline, and later production also suffered from the impacts of the ash falls. Despite everything, and with the risks from the reactivation of the volcano, fruit farming has remained, although on a more limited scale.

In 2001, the municipality estimated that 90% of the fruit production was lost, and 1500 families lost their livelihood; 40% of the farmers had past-due debts.

The overall strategy was based on forming and strengthening productive associations. In this way, the canton could move from humanitarian aid distributed to each affected family, to a search for solutions that could reduce vulnerability.

"*….to solve individual problems is very difficult…everybody came to tell us that they had lost the most, that they are poorer than the other guy, and we even saw how the aid made them form a line and said to them: you are victims, you are not victims, you are less affected, you have money, you don't have any money, and so they decided who to help…. and that was wrong, that goes against human dignity*." (Constante, 2010).

It was not practical to form only one canton-wide organization, and so the decision was made to structure organizations by type of productive activity and place of residence. Little by little, as the first associations were successful, other residents joined in and associated themselves, the economic activities began to diversify and support was pooled together to fund the entire activity. 22 associations were eventually formed, along with one second-level organization that grouped them together. Each association is made up of Household Production Units, and their eligibility to receive assistance from the municipality is certified by the president of each association. With this general

9 INEC, Population Projections 2001-2010

arrangement, the municipality supported various activities: pig and cuy (a type of guinea pig) raising, shoe production, and more recently meat processing, marmalade and jelly production, and the production of balanced feed for small animals.

Livestock activities

Upon being asked, residents chose cuy and pig farming, activities which have a long tradition in the canton. The intervention used existing knowledge and improved the infrastructure and above all how the animals were managed, through a long training process.

The municipality provided materials and technical assistance to build the dwellings for the animals and breed stock. The beneficiaries provided the labor, and cared for and fed their animals. The members of the board of directors of each organization monitored the activities of its members, and received and distributed the materials supplied. They were also responsible for identifying the most appropriate animals and presenting the respective purchase request to the municipal technician; with these inputs, the municipality completed the process of acquisition. The animals were only delivered if all of the members had completed their infrastructure; all of these precautions were intended to ensure the commitment of the beneficiaries, prevent paternalism and strengthen the organizations.

In 2008, a project funded by the United Nations Development Program built the capacities of the small farmers through training and the building of cuy stalls.

Traditional cuy shelter, Photo: Borja Santos Porras, UNDP

Upgraded cuy shelter, Photo: Borja Santos Porras, UNDP

Shoe manufacturing

At the beginning, there were 12 craftspeople who made shoes in the traditional fashion. By attending to their demands, the municipality provided them technical assistance and training, and also has facilitated their participation in trade fairs. The small shops have also been able to take advantage of other government aid, have received loans and have joined business chambers. Their capacity to associate has helped them to resist the onslaught of cheap shoes imported from Asia.

At the moment, there are around 50 workshops, each one employing an average of 30 people; the number of stores has grown from 2 to 15 (Constante, 2010). The workshops not only maintain full-time employees, but also hire independent artisans to produce parts of shoes in their own homes or workshops; in this way, networks of producers have been established to serve these small industrial businesses.

Other activities

The municipal government has launched complementary projects to add value to local production: a meat processing plant and a Services Center which has a cuy slaughterhouse, a feed plant, an agricultural input center and also provides training services.

Artisan in the shoe making, Cantón Cevallos, Photo: Cecilia Falconí, 2010

Canton development and physical land-use plan

The dynamics of the process made it necessary to formulate a canton development plant that could incorporate these activities into the budgetary and operational planning process. Later, a land-use plan was formulated, the first in the province, which was put into practice even despite significant opposition, and which represents, according to the mayor, a strength of the canton: "*The population growth of Cevallos is orderly… because we do not feel that there should be unorganized growth or development. So if we want to be animal farmers, very well, how do we organize ourselves, where do we want to go. If we want to be crop farmers, how do we order our crop production. Because it is not a question of putting things there which later will cause environmental problems*" (Constante, 2010). The Development Plan made it possible to identify and respond to other demands, like that of the group of 12 shoe craftspersons which eventually became an association with 50 workshops.

Gender focus

According to municipal staff, women represent around 75% of the attendees at the trainings and are the ones who lead the productive activities (Paña, 2009).

Financing

Given the lengthy nature of the process, it was possible to seek out different sources of funding and support. First, the municipality had to obtain the national government's understanding and support (specifically, the Civil Defense, which was responsible for the response until 2007) so that funds allocated to emergency response could be used for productive activities: *"the civil defense told us, because we were using emergency funds, they said what do the cuys have to do with the volcano? Where do the cuys fit in? What you have to do is buy masks for people, buy stuff like that, brooms, that is what you have to do, they said, give them training. So we told them that these are food security projects, basically to ensure the survival of the people*" (Constante, 2010). The Ministry of Finance also had to be convinced of the sustainability of the initiatives, and support was also sought from the Ministries of Social Welfare (today the MIES) and Labor.

International cooperation agencies also had to adapt to the situation, and overcome the variety and dispersion of their initiatives. Among the most significant donors were the COSUDE and the governments of Japan and Germany, the cooperation agencies from Italy and the United States and various United Nations organizations, especially UNDP: *"the incorporation of the United Nations Development Program was important because…. more than the amount of money that they gave, they believed in this process and in a certain way provided the complement, the definitive identity of recovering livelihoods, of talking with the people, of talking about survival"* (Constante, 2010).

Other important collaborators include the universities, and their technical contributions: the Technical University of Ambato, the National Polytechnic School, the Polytechnic School of Chimborazo; the Ministry of Agriculture, the INIAP.

Once the process is consolidated, the search for additional support and the continued technological development are also being taken over by the producers themselves, as is the case of the shoe manufacturers.

Sustainability and risks

The sustainability of the process rests above all in the diversification of production: the same family can raise pigs and cuys, have a garden and continue to grow fruit crops. Without a doubt, the political stability has facilitated continuity; the current mayor is now in his third term. In the future, it is believed that the capacities created locally will allow the municipal technicians and the population to obtain support from new authorities.

The intervention and leadership of the municipality are evident and sustain the process. The municipality has expanded its traditional role to support all of these initiatives, even creating a department for it: "*In the country, the main concern has always been – and it's fine – to provide water, give them a sewer system in the best case, or provide a sports field, build the community center, pave the road. That was the main concern of mayors… (but) Part of our vision of development has always been to support production…if people*

Drawing contest to conmemorate World Disaster Reduction Day, Cantón Cevallos

have income, if they have money in their pocket, they are going to have better education, better health, a better quality of life .. People have to live well, people don't have to live off of solidarity, from charity… one of the main activities of the administration is to support economic development. That is why we have the Local Economic Development Unit, the Local Economic Development Department, something that does not exist in many municipalities in the country" (Constante, 2010).

By growing production to such an extent, it could be that certain critical resources become scarce. Specifically, producers talk about a shortage of pastures for feeding the cuys and the lack of local labor for the shoe industry. The producers are responding to these situations with individual strategies (using their neighbor's land to grow grass, importing workers from nearby cantons) but the problem has not been systematically addressed yet.

In terms of natural threats, the main threat continues to be the falling of ash. This is followed by a shortage of water, a result of the deterioration of nearby *paramos* (high-altitude Andean plateaus). While the Cevallos canton does not contain *paramos*, it participates in a commonwealth with the cantons of Mocha, Quero and Tisaleo, where the *paramos* are, and contributes to the planning and execution of measures to conserve water and reduce pollution (water reservoirs, drinking pools for livestock, water source protection). The Provincial Council created a fund for managing *paramos* that supports several indigenous communities.

The recovery process seen by the community, Cevallos 2010

Analysis and conclusions

At the beginning of this document, some conclusions on the advance planning of post-disaster recovery were mentioned. Below are other important aspects of the processes that were analyzed:

Both in the case of the 2008 flood season as well as in the process that is taking place in the Cevallos canton, an element that stands out is the importance of leadership in convincing the stakeholders to think about, plan and execute the recovery, thus overcoming the tendency to limit interventions to mere response or to work in an isolated manner. Therefore, the design of institutional arrangements that facilitate leadership and coordination from the pre-disaster phase, will contribute to a faster response and a more efficient implementation of recovery efforts.

In the case of the Cevallos canton, its mayor is the visible head of the process of production diversification, and its main promoter. At the head of his team, he has been able to put together contributions from a variety of entities in order to keep the process alive; the stability of his leadership and undoubtedly contributed to this success, as he has been in office for ten years now.

In the case of the flood response, the Ministry of the Coast became and effective space for coordination and a facilitator of sectoral efforts: *"In 2008, things worked very well, the Ministry of the Coast was our office, and all of the players were there: health, education, agriculture, social inclusion, MOP [Ministry of Public Works], the militia, with a sense of belonging, with the idea of giving people back their confidence, of thinking about feasible ideas. There were four months of thinking about important solutions, which were finally realized. To the extent that the experience of the state response was categorically very superior to previous experiences…."* (Velez, 2010).

The experience, both personal and institutional, improves the governance of the response efforts and facilitates the road toward better recovery.

The leaders and main stakeholders of the processes described were not unfamiliar with issues related to risk management; on the contrary, from their positions as politicians or technicians they had gone through similar processes before. For instance, the mayor of Cevallos had been a council member during the first years of the eruption of the Tungurahua volcano, and the entire team of undersecretaries of the Coast, as well as the Minister of the Coast, had occupied technical or political positions in institutions or NGOs involved in responding to natural disasters and providing humanitarian aid. These personal learnings have been transmitted to the institutions led by these actors, both informally as well as through intense training programs. Only time – and the recurrence of new disasters – will tell how much has been achieved in terms of institutionalizing response and recovery capacities.

The response and recovery efforts benefitted from the existence of coordinating entities based in the territories, which bring together institutional, territorial and sectoral resources.

The experience in the coast demonstrates the benefits of taking various perspectives into account: that of institutions (ministries, development organizations, the militia); that related to the organization of the territory through the EOCs; and finally, the treatment of sector-specific issues by the corresponding ministries. Coordination was maintained even during the design of the recovery initiatives, which made it possible to share technical resources, prevent duplications and leverage the international cooperation contributions.

When the projects entered into operation, the management of those operations passed into the hands of the corresponding sectoral entities, and the coordination between institutions was gradually lost. An example of this is that while the MAGAP and the MAE both executed forestry projects, they did not share information on the supply of plants. Local authorities, once the emergency situation had passed and the humanitarian response phase had wound down, left the forums for coordination established in the EOCs and turned their attention to rebuilding infrastructure. The disappearance of the Ministry of the Coast, in late 2009, put an end to that experiment in regional coordination.

In the case of the coastal and Amazon regions, where weather phenomena produce large-scale effects that transcend provincial boundaries, consideration should be given to establishing regional EOCs that can take on the territorial dimension of response and recovery. Mechanisms must be sought to monitor and accompany efforts so that coordination is maintained even during the project implementation phase, even though at that point sectoral leadership becomes more prominent.

Before the disaster, work must be done to characterize and reduce vulnerability

All of the projects analyzed aim at, at least in their intentions, to fulfill a double role: to reduce the underlying vulnerability that makes victims so susceptible and to facilitate the availability of employment and income so that they can recover after the disaster. In this sense, "saving them" to implement them in the recovery phases is not ethical nor useful; it makes more sense to take actions to reduce vulnerability in the pre-disaster situation, especially in areas that are repeatedly affected by recurring events; or, if the projects are executed as a response to an event, efforts must be made to make them sustainable.

"*…when a person or a community does not have economic resources, or a good standard of living, they are much more vulnerable to any emergency that happens…So then if projects are carried out in these communities to strengthen the local economic, the people will be better prepared to be able to withstand the emergency. If a person lives in a flood-prone area, and ... his fields are flooded, but he has savings, and he has the chance of earning income from some other source that is not exclusively agriculture, he could resist the emergency, once the problem passes and obviously he will suffer some*

economically, but will not be ruined… So one way to prevent disasters is not only with recovering river basins or rebuilding infrastructure, but basically from my point of view, it is to focus on improving the living, socio-environmental and economic conditions of those local communities" (Chavez, 2010).

"*The issue is continuity and sustainability. The nurseries are a strategic kind of project, that can help us to recover from a situation like the one we went through in 2008…*" (Velez, 2010).

Rather than having portfolios of projects ready to present after a disaster, it is necessary to develop common criteria geared toward recovery to be applied as early on as possible, as an integral part of the response measures.

Pre-designed projects with the exclusive purpose of creating jobs or recovering income have the disadvantage of not being contextualized – to the type of threat, the characteristics of the terrain, the knowledge and culture of the affected population, etc., and it could be more difficult to take advantage of the unique opportunities that accompany each process. It is more useful to develop criteria ahead of time, with the institutions that will be participating in the response, that all of the interventions should meet: giving employment preferably to affected families, promoting work opportunities for women, appropriately using local resources, encouraging participation in project prioritization…

When selecting interventions to recover or diversify livelihoods, the demand for technical accompaniment and material that each type of project could generate must be considered, and institutional resources should be planned accordingly.

In the case of the Cevallos canton, all of the interventions began with economic activities that were already traditionally practices (raising small animals, shoemaking), and therefore the effort was focused on introducing technological improvements and building capacity, as well as providing the beneficiaries with inputs to expand their businesses. This, together with the length of the process and the continuous political support, make it possible to adjust the support depending on the availability of technical and financial resources, to end up with strong groups of producers capable of properly managing their businesses.

In the case of the coast, relatively novel initiatives were tested during very short periods of time. One new activity was fish farming; in order to guarantee its success, an extraordinary commitment was required, both from the producers as well as the technicians who accompanied the process:

"*What was the main problem? Starting this from scratch. Because it was a new project, and you know that you are working with people who to a certain extent are a little closed-minded. So there was a small problem when we tried to make them see many things… We had an average schedule of visits, visiting 4 pools and we were in the field from 6 in the morning to 10 at night. Imagine! We had an average of 4 inspections per day,*

5 people! …. because really in our zeal to bring life to the project, we went over the edge…" (Pasquel, 2010).

The forestry nurseries also required a continuous investment of resources and technical support to be maintained, as well as the establishment of commercial ties with the buyers of the species produced. In addition, one has to work on the demand side, encouraging the planting of timber species as well as fruit and more traditional crops, like cacao, coffee or African palm. In that sense, the lack of resources to give continuity to the support is a threat to the sustainability of the intervention.

"*…. the limiting factor is always the resources needed to be able to refinance, to multiply the plants again. We have done tours, we see that the facilities are being maintained, the nurseries are there… and the people are willing, anxious, to start up again. We are making a re-investment, a re-engineering in order to later, after some discussions, see how we can finance the project again so that the people can continue producing plants, and obviously keep working*" (Velez, 2010).

The interventions financed by the MAE rehabilitated tourism infrastructure but did not strengthen local capacities to manage the tourism business. Unless synergies are sought with other projects or programs, it is likely that the infrastructure will deteriorate again.

"*….in order to foster sustainable economic development in these communities, it is not enough to rebuild infrastructure, but there has to be accompaniment afterwards … if that community has no idea how to market tourism, it has no idea because it has no experience in attending to visitors, how can they make any money with that infrastructure? What could happen is that when the infrastructure fails to generate resources because the people don't have the necessary capacities, and don't have the money to maintain the infrastructure, it could deteriorate…So the projects have to go a step farther, and think about ending the project only when the person who received the benefit is fully capable to produce economic resources in a sustainable way, and better yet can incorporate the conservation of nature in the generation of those resources*" (Chavez, 2010).

The funding (both in terms of quantity and availability) is a critical factor. The existing legal framework, which prohibits the establishment of reserve funds, makes it necessary to seek other types of arrangements that can ensure the timely allocation and execution of the necessary resources.

All of the interventions, and even the immediate response, suffered because they were not able to mobilize resources fast enough. There are no arrangements that allow for a fast release of funds in the event of an emergency, like the one in 2008; in Tungurahua, it was difficult to use the funds allocated for response in the recovery phase, even if that made more sense in the context of the situation of the Cevallos canton.

In the case of the coast, the humanitarian response began in January, coinciding with the start of the 2008 fiscal year, and the beginning of a new system of financial administration

(ESIGEF) which, regardless of the political will to allocate resources, complicated the release of disbursements to attend to the emergency (Portaluppi, 2010).

"*the Civil Defense told us, because we were using emergency funds, they said what do the cuys have to do with the volcano? Where do the cuys fit in? What you have to do is buy masks for people, buy stuff like that, brooms, that is what you have to do, they said, give them training. So we told them that these are food security projects, basically to ensure the survival of the people. And we kept talking to them and they also began to be interested in the issue, luckily we were clear about where we wanted to go, and we convinced the Civil Defense….. the same thing happened with the people from the Ministry of the Economy, the officials said: but you guys are crazy… putting the cuys there, if you give them that then they will eat the cuys the next day and will be left with nothing, that is not going to work, they said .. so we explained it to them: that is why we have a legally constituted organization, there are commitments involved, etc." (Constante, 2010).*

International cooperation funds, when they are given to the State, are processed in a manner similar to that of public funds, which also makes it difficult to mobilize them: "*They (representatives from international donors) came on February 10… and they said to me: what do you need? 10 million or 10 mattresses? And I said: 10 mattresses, I don't need money because I can't do anything with it*" (Portaluppi, 2010).

Current Ecuadorian legislation prohibits the establishment of emergency funds, under the assumption that good budgetary planning makes them unnecessary. The (relative) unpredictability of the occurrence and the magnitude of natural threats contradicts this idea; in order it to become unnecessary to declare states of emergency, all of the risks would have to be mitigated beforehand, which is impossible in reality.

"…*emergency funds would have fewer reasons to exist at the moment that the public institutional system shifts to employing risk reduction as a regular and systematic practice, that everything done is done with this focus, in that case the fund would have fewer reasons for existing, because you would have all public institutions oriented toward this perspective of reducing vulnerability, building capacities, etc., and incorporating these actions into their institutional budgets*" (Portaluppi, 2010).

In the absence of these kinds of funds, the institutions can make use of other mechanisms, like annually requesting *funds for settlement*, in order to overcome the initial delays in mobilizing resources for response actions (Portaluppi, 2010).

From the point of view of the beneficiaries of productive projects, it is also necessary to provide them with timely access to credit, so that they can replicate or expand successful experiences; as well as to facilitate mechanisms to forgive or refinance debts. As a last resort, it is useful to turn to direct monetary transfers through a careful selection of recipients.

The only project that concerned itself with establishing sustainable mechanisms to finance the initiatives of the rural residents was the Rural Aquaculture project. From its design

phase, while resources were being negotiated with UNDP to implement the pilot project, an agreement was established through which the National Development Bank would provide credit to producers who wanted to begin this activity, with payment installments that coincided with harvest periods. In those cases, the Sub-secretariat would certify the aptitude of the producer and provide all of the technical support necessary. The problem was putting the mechanism in place – the bureaucratic hurdles made it difficult for small producers to access formal loans. In the case of the Development Bank, the constant turnover among the directors of the branches meant that the new directors didn't know about the project and didn't facilitate the issuance of the loans, despite the fact that there was an agreement in place.

In addition, there need to be policies so that those who have lost their livelihoods can refinance their debts or have them forgiven. In the Ecuadorian case, debts owed to the National Development Bank were renegotiated. Perhaps it would be wise, in order to avoid the misuse of loan funds, to develop criteria ahead of time that would determine whether a loan should be forgiven, based on empirical evidence of the damage, or by using instruments that can more precisely determine the areas affected.

Finally, and in order to restart the economy of the affected regions, it can be helpful to use the mechanism of making direct monetary transfers through the distribution of an Emergency Bond. In the case of Ecuador, the beneficiaries were selected by cross-checking the list of people affected with the SELBEN database, which is used to administer the Human Development Bond; in this way those distributing the bonds were assured that the money would be going to the most economically vulnerable people. (Portaluppi, 2010).

The role of the international cooperation community, in addition to providing funds and inputs where necessary, is useful in advising domestic institutions on how to manage certain topics.

There are technical areas, like the organization of the humanitarian response, ensuring food security, welfare and the emotional recovery of children and women, preventing gender violence and sexual attacks in the shelters, the shift toward recovery, job creation, where the timely provision of technical support by international cooperation institutions can mean the difference between a limited response and the recreation of vulnerabilities, and a process that promotes sustainable development, and that can stave off poverty and environmental degradation.

"*….they (the technicians provided by cooperation agencies) spent the entire emergency there and also took part in the working groups, for example the WFO, UNDP, OCHA, UNICEF... and in the case of the recovery focus, I think that UNDP helped us there a lot… With UNICEF, the Population Fund (UNFPA)…., come help us to see how to incorporate gender in all this… and we did. Especially in the shelters, with issues like preventing violence, sexual violence, the support package for women. With UNICEF we did something extraordinary, which was part of the recovery process… which was the part of helping people to recover emotionally, especially boys and girls*." (Portaluppi, 2010)

The gender approach must be more fully incorporated into the proposal design process.

Despite the active inclusion of women in the projects in the coast, they continue to play supporting roles to their spouses: in fish farming, they take over only when their husbands are away; in the reforestation, they help their husbands. In general, the husbands make the decision on how to manage and sell the production, when there is any.

Thought must be given to projects that ensure that women have a greater control over the resources. To start with, the uses of the money earned from these projects, especially those intended to provide temporary employment, should be studied: Who decides how the money earned is spent? Is the money used to recoup losses and restore the health and nutrition of the family?

There must be a database of information documenting the magnitude and recurrence of the impacts of these natural phenomena.

It is evident that these threats are chronic and recurring; in this sense, it is surprising that there are no estimates of their accumulated impact. It appears that with each new episode, whether a heavy rainy season or new volcanic activity, triggers new chapters of damage assessment, response and recovery efforts that do not benefit from the knowledge of the pre-existing situation. There are many questions whose responses would undoubtedly make it easier to make the right decisions when doing development planning for these regions, and when building up the institutional structure related to disaster risk reduction. Some of these questions are posed below, though this is far from an exhaustive list:

- What has happened with the population of the cantons affected since the Tungurahua volcano began erupting? Has it decreased, as people say it has in cantons like Penipe? Or has it increased as a result of the productive development spurred on by the recovery, as some of the residents of the canton of Cevallos think? How are the indicators of povery, equity, quality of life in the area? The results of the new Census of Population and Housing will help to clear up these doubts. But since this is a region that is so exposed to the threat of the volcano and with so much underlying vulnerability, it would be a good idea to conduct periodic surveys of population and economic activity, which would help to estimate the success or failure of the recovery strategies implemented (or not) in the affected cantons.
- In the case of the coastal region, the impacts of rainy seasons are recurring; the only thing that varies is their length and seriousness. There are surely groups of people at risk who are trapped in recurring cycles of losses, incomplete recovery processes, greater vulnerability, greater losses…. Where are these citizens? How can we help to break the vicious cycle?
- From the point of view of disaster risk reduction, is it reasonable for the population to remain in the areas where the impacts are recurring? To what point should we

be encouraging the occupation of those territories? If it is inevitable, how can the underlying vulnerability be reduced and kept from increasing with each event?

- How much money has been spent in all of the response and recovery efforts, and how has this spending influenced the economic recovery of the regions involved? Have the risks been recreated?
- What measures have the most impact and sustainability? How can the government evaluate and prioritize investments to response to each event and strive for recovery?

In the case of cities at risk, there have to be exploratory and almost experimental approaches to begin to learn about an influence a reality that is not taken into account by those managing disaster response, recovery and local development efforts.

While many cities and towns were totally or partially covered by water during a large part of the rainy season, there was no information available about how much economic activity was affected there, nor budgets to intervene in urban areas. It can be assumed that the economic impacts were very serious, especially for informal vendors, who usually occupy the streets which are easily flooded.

In the case of urban areas, the information gathering should begin from zero. Research must be done on how the economies of cities at risk work; what is the status of basic services; how much social vulnerability is there; how does the informal sector function; what happens when the threats become real; who are the most affected.

There need to be damage scenarios, vulnerable sectors and activities must be identified and working groups formed to reflect and propose solutions, especially in areas susceptible to flooding, even during winter periods that can be considered within normal range.

For this case in particular, one recommendation is to develop a portfolio of pilot projects, which include monitoring mechanisms, in order to test them in the event of a new emergency.

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