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REPORT OF THE PORTFOLIO MONITORING MISSIONS IN HONDURAS AND NICARAGUA

Executive Summary

This report presents the findings from two monitoring missions undertaken in November 2013 to projects financed by the Adaptation Fund and implemented by the United Nations Development Programme (UNDP). The projects, both in Central America, seek to build the resilience of vulnerable communities to climate change through interventions in the water sector. The first project visited, in Honduras, focuses on urban communities in the capital city of Tegucigalpa. The second project visited, in Nicaragua, focuses on rural communities in a watershed of the Estero Real River. At the time of the visit both projects had been underway for a period of around two years, and provided an opportunity to glean early lessons from the early experience in implementation and execution. More broadly, monitoring missions are an important component of the Adaptation Fund's results-based management framework and seek to draw lessons across the portfolio to feed back into the Fund's policies and operations.

At the portfolio level, a number of early lessons were gleaned:

Institutional arrangements - Coordination between implementing and executing entities differed on the two projects, reflecting the importance of context specificity in designing appropriate implementation arrangements. In Honduras, the implementing entity had an active role in providing technical oversight to the project, whilst in Nicaragua project delivery was largely devolved to the executing entity and highly decentralized to the rural areas. These differences may be attributed in part to the different political systems in each country, and in part to the geographical characteristics of the target sites.

Stakeholder participation - In Honduras, there was a focus on involving multiple government entities, the academic community, and civil society, through an inter-institutional climate change committee. The inclusion of a high number of stakeholders had been purposeful and had brought about two primary benefits. Firstly, adaptation would be mainstreamed in all entities with responsibilities in the water sector. Secondly, the inter-institutional nature of coordination would provide continuity during and beyond the project despite the likelihood of political changes. In Nicaragua, the prevailing political model encourages people involved in the project to be seen as "protagonists" rather than "beneficiaries". Stakeholder engagement in Nicaragua, accordingly, was more focused on the devolution of responsibilities to the local level, and ensuring ownership through commitments from protagonists to undertake certain activities.

Challenges in rural and urban adaptation – Despite both projects focusing on the water sector, there were notable differences in the challenges in adaptation in the rural and urban contexts. The intervention sites in the Nicaragua project were remote from the capital city, which may have been a contributing factor to the high decentralization of execution to government services in rural areas. The densely populated urban milieu in Honduras poses particular challenges for adaptation, namely violence in impoverished areas, the continual movement of slopes despite ongoing stabilization and risk reduction works, and an apparent infrastructure deficit where water scarcity is the norm and urban communities are not sufficiently adapted to current climate variability. The scale of the problem, in each case, is evidently too vast to be overcome fully through a project-based intervention of the scale funded through the Adaptation Fund. The interventions, accordingly, seek to demonstrate pilot solutions with immediate benefits for highly vulnerable communities. Attention must subsequently focus on how these are financially sustained and scaled out to other vulnerable communities with additional financial resources.

I. Introduction

Background

1. This report presents the findings from two monitoring missions undertaken concurrently to projects financed by the Adaptation Fund (the Fund) and implemented by the United Nations Development Programme (UNDP) in Central America. The common purpose of these missions was to collect information on watershed management practices addressing climate risks in the Central American region; collect information on implementation arrangements for adaptation projects; and to collect lessons learned on the earliest projects approved by the Fund. Monitoring missions are undertaken in the context of the Fund's results-based management framework and seek to draw lessons from across the portfolio in order to provide feedback to the Fund's operations as well as the processes of project implementation and execution. The methodology used for the monitoring missions comprised qualitative semi-structured interviews with key stakeholders from communities, local government, non-government entities, academia, ministries and UNDP, as well as visits to project sites and the review of supplementary information provided by stakeholders.

Objectives of the mission

2. The portfolio monitoring mission was included in the secretariat's work plan for FY14 which was approved by the Board at its twentieth meeting (Decision B.20/14). The projects selected for this mission were the project in Honduras "Addressing Climate Change Risks on Water Resources in Honduras: Increased Systemic Resilience and Reduced Vulnerability of the Urban Poor" and the project in Nicaragua "Reduction of Risks and Vulnerability Based on Flooding and Droughts in the Estero Real River Watershed", both implemented by the United Nations Development Programme (UNDP). A map of the project locations is provided in Figure 1 below.

Figure 1 – Physical Map of Central America (*source: National Geographic, online*)

3. The rationale for undertaking the monitoring mission in these two projects can be explained through the following characteristics:

a) Location: They are both located in the same region, namely Central America, and share borders within that region;
b) Sector: Both projects relate to the water sector, dealing with the impact of climate change on watershed management;
c) Components: Both projects were part of the earliest approvals by the Adaptation Fund Board (the Board), in the period preceding the definition by the Board of "concreteness". They present an important portion of "soft" adaptation measures - namely capacity building, policy development and planning compared with the majority of the projects and programmes in the Fund's portfolio.
d) Contrasting socio-economic situations: The project in Honduras targets the urban poor, whereas the project in Nicaragua is located in rural areas and targets farmer households.

4. Taking into account the context of the two projects as described above, three objectives of the mission were established:

Objective 1: to collect information on watershed management to address climate risks, in the Central American region, looking at the following aspects:

- The adequacy of the solutions proposed to address climate change-related risks in the water sector;
- The balance between "hard" and "soft" measures in adaptation projects and more specifically watershed management projects.
- The challenges for implementing adaptation measures in watersheds in urban and rural areas.

Objective 2: to collect information on implementation arrangements for adaptation projects, and more specifically watershed management projects, looking at the following aspects:

- The level of understanding of the implementation and execution functions by the project's stakeholders;
- The identification process of the projects' executing partners at the design stage and the contractual arrangements following approval;
- The level of involvement of local governments and communities in the project design, particularly the choice of adaptation measures, and the continued involvement during its implementation;
- The diversity of stakeholders involved in the implementation of the project and the challenges identified;
- The level of engagement with the private sector and the scientific community.

Objective 3: to collect information on how key project review criteria, that were assessed as adequately fulfilled prior to approval, have been applied during project implementation, including assessment of both the relevance of the criteria and the degree to which they have been met during implementation.

Methodology

5. The mission was undertaken jointly by the Adaptation Fund Board secretariat (the secretariat) and the UNDP Regional Office for Latin America and the Caribbean. It was carried out from 4 November to 8 November 2013 in Honduras, and from 11 to 15 November 2013 in Nicaragua. From the secretariat, the mission team was constituted of Mr Daouda Ndiaye and Mr Daniel Gallagher. The UNDP Regional Office was represented by Mr Reis Lopez Rello.

II. The project "Addressing Climate Change Risks on Water Resources in Honduras: Increased Systemic Resilience and Reduced Vulnerability of the Urban Poor" in Honduras

Context

6. The project "Addressing Climate Change Risks on Water Resources in Honduras: Increased Systemic Resilience and Reduced Vulnerability of the Urban Poor" became the joint first project approved by the Adaptation Fund Board at its eleventh meeting in September 2010. The project, with an approved funding of US$ 5,698,000, is implemented by UNDP and executed by the Secretariat for Natural Resources and Environment (SERNA).

7. Access to water is limited in many areas of Honduras. The country's growing urban population is leading to encroachment in areas prone to landslides and flooding, whilst climate scenarios indicate that existing water scarcity will be exacerbated by climate change and variability. These pressures lead to the largest urban areas (Tegucigalpa and San Pedro Sula) and several agricultural areas (Patuca basin) facing increased water scarcity in the near future. Additionally, Honduras is vulnerable to the El Niño phenomenon which, when considered in the context of increasing climate extremes, may severely impact the most vulnerable sectors of society.

8. The objective of the project is to increase resilience to climate change water-related risks in the most vulnerable population in Honduras through pilot activities and an overarching intervention to mainstream climate change considerations into the water sector. Given the cross-cutting scope of the water sector, the project seeks to incorporate climate change issues into the planning processes and investment decisions of key line ministries. Targeted work in Tegucigalpa and the watersheds that provide water to the capital city intend to validate concrete response measures – ranging from economic incentives to low-cost technology investments that aim to feed into orienting work at the policy level. The specific components of the project are:

- Relevant institutional structures including the National Water Authority, strengthened for mainstreaming climate change risks into water resources management as well as into national planning, public investment budgeting and decision-making processes at various scales.

- Comprehensive measures piloted to safeguard water supplies in Tegucigalpa City and its surrounding area, in response to existing and projected water scarcity and to the vulnerability to extreme climate events.

• Targeted capacity building and outreach to enable stakeholders at all levels to effectively respond to long-term climate change impacts

Progress to Date

9. Following approval of the project in September 2010, UNDP entered into an agreement with the Adaptation Fund Board in February 2011. An inception workshop was held in Tegucigalpa on 27-29 June 2011 and marked the commencement of project implementation. At the time of the monitoring mission, the project had been under implementation for 2 years and 4 months. In line with the performance-based grant financing used by the Fund, UNDP had submitted two annual project performance reports to the Board. To date, the Board has released the amount of US$ 4,187,787 of the US$ 5,620,300 approved for the project. During its implementation thus far, the following notable measures had been achieved:

- A coordination mechanism between SERNA and the Secretariat of Natural Resources and Environment (SEPLAN) for incorporating climate change into development planning had been agreed upon and four of 16 regions had already incorporated adaptation planning in their regional development plans through the application of a proprietary participatory methodological framework (CdT 4H).[1]
- The national meteorological network had been enhanced through the purchase and calibration of 46 new national meteorological network stations and the installation and development of a new climate-information network.
- Ecosystem water supply services in the high basins that serve the Tegucigalpa urban area had been protected through updating management plans for 35,380 hectares of protected area to incorporate climate vulnerability analyses and adaptation measures.
- The detailed design of concrete adaptation measures in vulnerable urban areas in Tegucigalpa had been undertaken, with high participation of community members and academia in the decision-making processes. The works seek to increase the adaptive capacity of at least 3,500 households with respect to water scarcity risk and at least 1,000 households with respect to flooding and landslide risk. The works in two principal communities were out to tender at the time of the mission.
- In the knowledge management realm, a range of high quality communication articles had been prepared for diverse audiences, to disseminate information on climate adaptation and best practices synthesized through the project.

Meetings with Institutional Stakeholders

10. The following meetings took place with institutional stakeholders, where the mission delegation discussed various aspects of the project implementation and execution, in line with the objectives of the mission.

UNDP Resident Representative and Honduras Country Office team

11. The mission team met with Mr. Edo Stork, Interim Resident Representative of UNDP in Honduras, Ms. Noelia Jover, Climate Change Officer, and Ms. Sandra Buitrago, Disaster Risk Reduction Officer. Discussions revealed that the Inter-institutional Committee on Climate Change (CICC), led by the Secretariat of Natural Resources and Environment (SERNA), had

[1] https://adaptation-fund.org/sites/default/files/Cuaderno_de_Trabajo14012013_v30_(simbologia)%20baja%20definici%C3%B3n%20x%20mail.pdf

played an instrumental role in bringing together a multitude of actors to collaborate on this project, and more widely on adaptation issues in the country. These entities drew from academia, non-governmental sector and several government bodies. The project, from UNDP's perspective, represented a key part of their strategy for Honduras to focus on pro-poor development. Specifically, the urban context is a central focus for the country strategy and the project's focus in this realm, both at the design stage, and looking ahead, was in keeping with this aim. The project team reported that the "national water authority" which had been proposed through the project had not come to fruition as it did not have the required political backing for operationalization. That being said, the essence of the functionality of such an institution was indeed present through the inter-institutional nature of implementation, and the work that was being delivered though the project.

Secretariat of Natural Resources and Environment (SERNA)

12. The project team at the National Office for Climate Change (DNCC) provided an overview of the institutional arrangements through which its involvement in the project was managed. Within SERNA, the sub-secretariat of environment provided oversight to the DNCC, which in turn was responsible for national delivery of action on adaptation to climate change. The project coordinator, a staff member of SERNA, provided the link between the project board and the multiple stakeholders involved in the project execution.

13. One of the primary challenges faced by the project execution team in SERNA related to the coordination of a multitude of entities; this was the "first time that so many entities had been brought together" to deliver a project of this type and scale. The variety of perspectives at commencement resulted in increased complexity in managing differing expectations and priorities in addressing adaptation needs. At the same time, this challenge had brought new opportunities. For example, the capacity building that was offered through technical seminars and postgraduate courses in adaptation was spread across all entities involved, including non-governmental and community-based stakeholders with tailored training according to the needs identified through the project. This was an opportunity for stakeholders to come together to share perspectives and proposed solutions for adaptation challenges in urban areas, which was a valuable prelude to their work on the project together. This set the groundwork for the concrete achievements of the project to date, such as the establishment of a centralized and shared meteorological network, which required the coordinated work of several institutions.

14. On the urban nature of this adaptation project, the project differed from rural projects in several ways. Firstly, it was felt that urban communities in Tegucigalpa often had a marginally higher income than rural communities in the surrounding areas. This did not necessarily translate to higher wealth since there was diminished purchasing power living in areas with higher living costs, and this gave the impression that urban communities on the whole had a lower quality of life than their rural counterparts. Marginalized urban communities often lived on illegal lands in unplanned settlements at high risk of landslides and flooding. Such areas were, additionally, characterized by high poverty and often gang violence, including in some of the areas that the project sought to intervene.

15. A positive observation from working in the urban realm was that communities experiencing the urgency of the risks facing them were eager to be supported, and to contribute to the delivery of concrete solutions. As such, the project solutions in urban areas had been designed in a highly participative manner where communities were included in decision-making along with SERNA, the National Autonomous University of Honduras (UNAH) and the Municipal Government of Tegucigalpa. A further positive characteristic of the urban project related to the

proximity of several of the main entities, who could meet and collaborate in the same city. Similarly the greater urban area and the peri-urban to rural catchment areas that provide water to Tegucigalpa were in close proximity to the headquarters of the entities involved.

16. With regards to sustainability, discussions took place on how the measures may be replicated in the future. Due to limitations in the national budget, the project had provided a valuable opportunity to finance measures that concretely reduce climate risk, and would not have been undertaken had the project not received finance from the Adaptation Fund. Given the enormity of the adaptation needs of Tegucigalpa, and more widely Honduras, the challenge looking forward would be how to ensure that the measures that are being piloted can be scaled up and scaled out to address the adaptation needs of other vulnerable communities. The team at SERNA felt that the pilot activities were a crucial step on the road to addressing the challenge more widely, and integrating climate considerations throughout all sectors.

Autonomous National Service of Aqueducts and Sewers (SANAA)

17. The Autonomous National Service of Aqueducts and Sewers (SANAA) reported that water supply for Tegucigalpa comes from four principal watersheds yet is insufficient to meet the needs of the city population. The water provision amounts to approximately 50 per cent of the actual water needs, and as such, the city's population experiences frequent and severe cuts in water supply. The main role that SANAA plays in the project is the installation and management of four automated weather stations (one in each watershed), and the formation of 17 local water boards, with legal, technical and administrative support. Together with the Institute of Forest Conservation (ICF), it has trained local people in the designation of protected areas, and conservation management practices for land use and protection of the water resources. It has trained 30 technicians from across all actors involved in the project and is cooperating across institutions in the delivery of its work on the project.

National Meteorology System (SMN)

18. The principal role of SMN in the project is to develop the network of climate and weather information in the country. This involves the installation and management of a network of 46 new automated weather stations (four of which are installed by SANAA). At the time of the visit, all the testing of the equipment had been completed. As part of the agreement with the equipment contractor, staff from the four entities involved in the project undertook the full installation and calibration of the equipment. Whilst this has required technical training and has lengthened the process, the key benefit is the sustainability in the long term, since SMN and the supporting institutions will be able to administer maintenance autonomously. The key challenge in this component of the work has been technical limitations i.e. the lack of GPRS coverage in Honduras. The data gathered is available online at *smn.gob.hn/web* and will be shared with all actors that require such information for their decision-making on climate risks.

Technical Secretariat of Planning and Cooperation (SEPLAN)

19. The delegation met with SEPLAN to discuss the entity's work on mainstreaming adaptation considerations into regional development plans both in the urban areas of Tegucigalpa, and more widely throughout the regions of the country. Together with civil society and NGOs, and technical staff from UNDP and SERNA, SEPLAN had developed a participatory adaptation planning methodology. This methodology, made available in a workbook format had been applied to five regional planning processes throughout the country with the intention to fully mainstream adaptation into development processes. The clear result is that concrete adaptation

measures are now included in these regional development planning budgets and plans in a way that had not been previously. The process had been undertaken in a participatory manner, evidenced by the number of entities involved and the bottom-up process of designing the plans for investment activities in each region together with the prospective beneficiaries. In addition, each regional plan had an action plan of how to coordinate infrastructure investments and identify potential sources of funding.

20. The added value of the Adaptation Fund project, according to the experience of SEPLAN, was to bring adaptation into the planning process in a way that had not been considered previously. In that respect, it was clear that adaptation is now fully incorporated in the planning process throughout all of SEPLAN's work, and at the regional level through the regional development boards. Whereas previously there had been an awareness of disaster risk reduction, and consultants used to be used to deliver technical support in this area, capacity built through the project now meant that SEPLAN had its own in-house expertise on adaptation and its crossovers with disaster risk reduction. An unintended positive impact, which staff remarked may indeed be the most positive aspect of the whole project in terms of adaptation planning, was that the institution realized the need to have their own in-house expertise in this area to ensure full mainstreaming of adaptation in the long-term. As such, SEPLAN had been able to develop with in-house expertise two web-based planning tools which allow public and private institutions to make more informed decisions regarding investments in infrastructure and related developments. The main users of these new tools were the government, national universities and private sector entities. The continuing challenge will be to ensure that the information provided through the portals was accessible and user-friendly to a wide audience.

Autonomous University of Honduras (UNAH)

21. The academic staff from the Department of Earth Sciences and the Department of Civil Engineering, were responsible for contributing to several project outputs, including a technical diploma which had been financed through the project and had delivered high-quality training to staff across several institutions. This had been the foundation work to ensure that adaptation would be considered in every institution relevant to the project, and widely throughout the country. It had been an exercise in breaking down silos, encouraging people from diverse professions and institutions to work together on a common problem, and culminated in research projects that were demand-driven according to the needs of the respective institutions.

22. The Department of Civil Engineering had been strongly involved in the vulnerability studies and the design of the concrete adaptation works in Campo Cielo and Cantarero Lopez. Graduate students had contributed to the design of 14 community-based adaptation proposals in urban areas of Tegucigalpa characterized by extreme poverty where many inhabitants lived on less than $1 per day. These communities lived generally in informal settlements that had sprung up over the past 30-40 years, were at high risk of landslides, and the majority did not have access to an adequate supply of potable water. The students had undertaken community surveys, consultation, design and verification of the proposals, and iteration on the proposals under the guidance of a consultant engineer from the Municipal Government of Tegucigalpa. A clear benefit of the involvement of academia in the project's design was the practical experience that the students had gained on concrete works that would otherwise have taken them several years of professional practice to obtain. The university students and graduates gave detailed presentations on their designs in fourteen urban adaptation contexts. A particular case related to the urban community of *Campo Cielo*, where unstable lands had been built upon and the saturation of soil frequently leads to loss and damage due to landslides. The proposed amelioration works in this case comprised rainwater harvesting from all the roofs in the

community, which covered an area of 50 per cent of the sub-catchment, as well as improved drainage canals to evacuate the area of excess water that would otherwise exacerbate landslides in times of extreme rains. These works were expected to benefit 336 families and 521 primary school children. The works are presently out to tender, a process being managed by the Municipality of Tegucigalpa.

Image 1 – Model prepared by university students and graduates involved in conceptual design of rainwater harvesting works in the urban settlement of *Campo Cielo*

Image 2 – Model of rainwater harvesting model at the individual level, as an adaptation strategy to reduce water infiltration on steep slopes, prevent landslides, and increase water supply

Ex-Minister of Environment

23. The mission team met with the ex-Minister of Environment, Dr. Cuellar, to discuss his role in coordinating the initial stages of the proposal formulation through to its approval and implementation. He had been involved in the process of overseeing project formulation at the very early stages and, as such, could comment on the project's evolution to the present day. He remarked that a cornerstone of the project implementation had been its participatory nature, which had been deliberately done in the knowledge that successful adaptation initiatives would need all key actors to take ownership over the solutions being deployed. He said that the government could be proud of the project to date and its creation of dialogue between many institutions that were actually collaborating on the delivery of concrete works. It was not SERNA who was undertaking all the work, on the contrary there was equal involvement with civil society, academia, and all of the institutions through the inter-institutional committee on climate change. He noted that this wide participation guaranteed some stability to the project regardless of any potential change in government administration in the upcoming elections.

Municipal Government of Tegucigalpa

24. This meeting focused on the experience of the Municipality in executing the concrete adaptation works in four highly vulnerably neighbourhoods (*Campo Cielo, Cantarero Lopez, Jose Angel Ulloa* and *Fuerzas Unidas*) as well as their working relationship with other stakeholders. The works in these communities sought to increase the adaptive capacity of at least 3,500 households with respect to water scarcity risk and at least 1,000 households with respect to flooding and landslide risk. In prefacing the discussion, staff from the Municipality recognized that their involvement in taking on the challenge of adaptation had required a change in culture from the realm of disaster risk reduction. Honduras had a solid history with international support in disaster risk reduction, especially with support from donors following Hurricane Mitch in 1998, but adaptation required a move away from predicting and preventing the impact of disasters, towards the incorporation of climate uncertainties and more proactive approaches to planning.

25. For this adaptation project, the design of the concrete adaptation works had sought a close collaboration with the academic community through the involvement of the departments of civil engineering and earth sciences from the Autonomous University of Honduras. The students and graduates, under supervision of senior academic staff, had been involved in the participatory consultation with communities in *Fuerzas Unidas* and *Campo Cielo,* followed by the preliminary design of rainwater harvesting solutions and stormwater drainage schemes in the target areas. The relative inexperience of the students and graduates, however, had necessitated technical backstopping through verification of all of the proposed designs from an engineer hired by the municipality.

26. The practical challenges that the municipality encountered included (i) the continual physical impact of land movement impacting the project area, where it was clear that vulnerability was dynamic and was likely to remain medium to high over the long term, even if these pilot interventions reduced it to some degree; (ii) land tenure and building code compliance issues had not been fully considered at the design stage, where for example it was clear that houses had been constructed without proper enforcement of land use planning regulations and building codes, as is common in much of Honduras. Hypothetically, a more optimal situation could be to recognize that the land should not be inhabited due to its high vulnerability, yet the reality of densely populated urban areas is that land is at a premium and high-risk slopes are necessarily occupied. Adaptation strategies therefore had to seek to

improve the situation in a pragmatic manner accepting that optimal solutions are often unattainable due to resource limitation and issues of practicality; (iii) it had become apparent that the scale of the larger adaptation problem in Tegucigalpa was far larger than could be addressed through funding this project alone, and as such, the pilot measures undertaken with funds from the Adaptation Fund would need to be complemented on a large scale with alternative sources of finance. For now, the municipality recognized that it was key to work closely with the other institutional stakeholders (particularly SEPLAN) in mainstreaming the pilot initiatives more widely in public policy and planning in order to direct the required funding to the adaptation and disaster risk reduction needs of the country (iv) security had been a concern during project implementation due to the prevalence of violence in poor urban areas of Tegucigalpa. This had been mitigated by close participation of community members in the consultative process and site visits undertaken by, for example, the university students and graduates. This approach of constant dialogue had created a level of trust that helped to reduce the risk of crime or violence against stakeholders involved in executing the project works, and would be maintained going forward.

Fundación Vida

27. *Fundación Vida*, a Honduran non-governmental organization, which was part of the Adaptation Fund NGO Network, had followed the project closely since its inception. The representatives from *Fundación Vida* presented the findings of a monitoring report it had produced earlier in the year and discussed its perceptions of project implementation to date. *Fundación Vida* confirmed that there had been sufficient flexibility in project design to allow for continual involvement of community members in decision-making and that community members were generally very supportive of the project. An important observation was made that the inter-institutional committee on climate change (CICC), which had technical and political character for climate change decision-making, had representation from all major government and non-government stakeholders and, as such, continuity was expected in the approach on climate adaptation, regardless of any change in government in the forthcoming national elections.

Closing meeting with Inter-institutional Committee on Climate Change (CICC)

28. The mission team participated in a meeting of the CICC which functioned as a closing meeting for the week-long mission. The representatives of the Adaptation Fund Board secretariat presented its preliminary observations on the successes of the project thus far, and the challenges that remained during the remainder of the project implementation and beyond. It was clear that the water scarcity problem in Tegucigalpa was immense and that the urban population was highly vulnerable to the impacts of worsening floods and droughts. The project had succeeded in bringing together for the first time a very large range of stakeholders to seek a long-term solution to addressing the urgent adaptation challenges. To date, it had put in place much of the groundwork for mainstreaming adaptation in the planning process, ensuring that institutions had the technical and human resources to adapt, through training key personnel on the climate adaptation diploma, and had begun to install the meteorology equipment and system that would equip the country to take better long-term decisions on climate adaptation. The remainder of the project would now seek to pilot the concrete works in urban areas that aimed to reduce the impacts of floods (through storm water drainage) and droughts (through rainwater harvesting). The challenge in the longer term would be to seek national and international financial commitment for scaling up adaptation solutions into public policy and action.

Site Visits

29. The mission team was unable to visit the urban areas of *Campo Cielo* and *Fuerzas Unidas* due to security concerns, but was briefed on progress there from the Municipal Government of Tegucigalpa, the university (UNAH) and *Fundación Vida*. Two site visits were undertaken: firstly, to the urban location where weather instrumentation was being calibrated, and the installation area of one of the new systems at *Represa Concepcion*, then secondly to the watershed of a major river which supplies water for Tegucigalpa: *sub-cuenca de Rio Guacarique*.

Visit to calibration site of meteorological instrumentation

30. The mission team visited the temporary site of the new automated meteorological instruments, which had been received by SNM and SANAA and were undergoing calibration at the time of the visit. Staff from SNM explained that there was a lack of experience with automated weather stations in Honduras, which naturally had meant some challenges had to be overcome during the process of receiving, testing and calibrating the equipment. One measure taken in this regard was to train 30 people from the relevant institutions in Honduras with technical workshops delivered by experts from the equipment manufacturer. The same staff from the national institutions was responsible for the installation of the equipment and, as such, could share their experiences in doing so through the technical forum of the inter-institutional committee on climate change.

31. The main purpose of the advanced weather monitoring equipment, which measures seven meteorological variables, was to undertake hydrological studies and to share data through an online weather and climate system with decision-makers. Arrangements for the long-term maintenance of the equipment, such as the replacement of lithium batteries, had not been fully agreed with the provider of the equipment through the original tender, but arrangements were being put in place in this regard. Traditional equipment would continue to be used, where it existed, for backup and verification purposes with automated rainfall data.

Image 3 – Staff from the mission team discuss the installation of automated weather stations for generation of climate information with system operators

Image 4 – Staff from the mission team visit site of calibration of automated weather stations

Visit to sub river-basin (Rio Guacerique)

32. The watershed of the Guacerique River, to the west of Tegucigalpa, is the main source of potable water to the city and its surrounding area, providing over one quarter of its water supply. The watershed is a protected forest area with an area of 211 sq. km and is home to approximately 11,000 inhabitants in 41 communities spread between rural and urban areas. Within the framework of the project financed by the Adaptation Fund, a land management plan has been put in place which intends to combat a number of issues, namely: the unsustainable exploitation of the forests and water resources, the lack of provision of basic water and sanitation, both of which are exacerbated by climate change and have the long-term of effect of diminishing the available water for the urban area of Tegucigalpa.

33. The visit allowed the mission team to see firsthand an overview of the land management works ongoing in the watershed, and to interact with beneficiaries of the project in one of the watershed's tributaries, *Micro Cuenca Los Horcones*. A meeting was convened where staff from the mission team could interact with children from the community, parents and teachers who had received training in climate change and had undertaken activities through the project, community leaders and extension staff from SANAA and ICF. Parents and teachers spoke about how climate change was bringing an uncertain future to the community, manifest through increasingly variable and severe floods and droughts, and demonstrated an understanding of the linkage between education on climate and conservation, upstream protection of vegetation and land, and the downstream availability of water resources for both rural and urban areas. The schoolchildren presented drawings that they had done depicting the importance of the environment to their wellbeing and the risks of not accounting for climate change. The mission staff then visited the upstream protection works and pilot micro-irrigation projects in the watershed. Small farmers had been supported by the extension services of SANAA and ICF, to acquire and operate micro-irrigation infrastructures, which allowed them to cope with water scarcity and improve their production. Water savings are very important for the horticultural sector since at least sixty per cent of the horticultural products from the watershed reach the city's market. However, producers' representatives explained that there was a lack of technical and financial support from extension services of the Ministry of Agriculture and national financial institutions, which impeded their ability to scale up the micro-irrigation projects piloted in this and other micro-watershed in the area.

Image 5 – Community leaders and government extension staff discuss the project intervention in the upstream areas of the Guacerique River watershed

Image 6 – Children from the school in the community of *Los Horcones* present their drawings depicting environmental and climatic challenges in the community

Image 7 – The mission team visited a demonstration site of a micro-irrigation system in the upstream areas of the Guacerique River watershed as an adaptation strategy that increased resilience of agricultural livelihoods through reducing consumption of scarce water supply

III. The programme "Reduction of Risks and Vulnerability Based on Flooding and Droughts in the Estero Real River Watershed" in Nicaragua

Context

34. The programme concept was endorsed by the Adaptation Fund Board in its tenth meeting in June 2010, among the first four concepts endorsed by the Board. The fully-developed programme document was approved by the Board in its twelfth meeting in December 2010. The programme is scheduled to have four-year duration with a budget of USD 5,500,950 and was launched in 21 June 2011.

35. The programme aims to reduce risks from droughts and flooding generated by climate change and variability in the watershed of the Estero Real River. In Chinandega and León, the Estero Real River Watershed (3,690 km^2), and in particular the sub watershed of the Villanueva River (1,550 km^2) – also known as Rio Grande or Aquespalapa – is emblematic of the combined impacts of development challenges and strong climate variability.

36. The programme relies upon a coordinated set of interventions designed to implement new public policies for addressing climate change, i.e. investments in infrastructure for storing and using rain and surface water in eight micro-watersheds in the upper watershed of the Estero Real River; introducing more efficient use of water in all production processes, increasing infiltration, strengthening soil structure, and stabilizing slopes; institutional development and capacity building in micro-watersheds, municipalities, and participating national institutions; monitoring and analysis of climatic conditions and changes in land use, water flows and soil quality; and the dissemination of results and lessons learned about building climate change resilience in vulnerable communities. Four outcomes are expected from this programme:

- Reduced risk of climate-induced water shortages for short scale domestic and productive uses in eight micro-watersheds in the upper watershed of the Estero Real River;
- Strengthened climate resilient agro-ecological practices for the effective use of available water in the eight targeted micro-watersheds;
- Enhanced institutional capacities for the incorporation of climate change risk management in work plans, policies, and normative instruments in the Villanueva River sub-watershed, and the watershed of the Estero Real River; and
- Disseminated results and lessons learned about building climate change resilience in vulnerable rural communities. This will be based on ongoing monitoring and analysis of climatic conditions and changes in land use, water flows and soil quality.

Progress to date

37. The programme is implemented by the UNDP office in Nicaragua and executed by the Ministry of Environment and Natural Resources (MARENA). UNDP has submitted two Programme Performance Reports (PPRs) so far, with the latest one under review by the secretariat at the time of writing. MARENA has made substantial progress in the execution of all the programme components, achieving this in coordination with the municipal governments, government institutions, NGOs and the active participation of the programme's beneficiaries. The total disbursement since the beginning of the programme until June 2013 has been

US$ 2,142,787. It is estimated that by the end of 2013 implementation rate will have remained steady and the total cumulative expenditure will represent more than half of the programme's total budget. Some of the key results achieved to date are outlined below:

- MARENA has completed construction of two communal irrigation systems, with an irrigation capacity of 170 ha, that will increase water availability for domestic and productive use, benefitting 68 farm families of Las Mercedes micro-watershed and 32 farm families of the Salale micro-watershed.

- A total of 1,005 families will benefit with agro-ecological farm transformation plans to introduce sylvo-pastoral systems, of which 920 have already been formulated and finalized with farm families and 840 are in the implementation process. Likewise, actions aimed at benefitting women are being implemented through investments for patio productive activities (improved stoves, chicken coops and pigpens).

- To strengthen the population's capacity to prepare for climate change impacts, Municipal Climate Change Adaptation Plans have been formulated for the municipalities of Achuapa, El Sauce and Villanueva through a wide participatory process of consultation and consensus between different institutions.

- Additionally, eight Micro-watershed Committees were formed, which are duly registered in the National Registry of Water Rights (RPNDA), being legally constituted to undertake their functions in the management of the water resource.

- Technical assistance has been provided for the implementation of the eight electronic information posts, for the purpose of collecting baseline information on the indicators of the selected micro-watersheds. The information nodes' main function is to feed the National Environmental Information System (SINIA) to develop geo-referenced information that will be used by the local stakeholders as a monitoring tool for the activities carried out by MARENA in El Sauce, Achuapa, and Villanueva. These posts have thus far produced three news bulletins.

Meetings with institutional stakeholders

38. The following meetings took place at the premises of MARENA in Managua, with several government institutions that were involved in the execution of the activities of the programme.

The Vice-Minister, Planning Director of MARENA and the Programme Coordinator

39. Ministry representatives emphasized the importance of the programme for Nicaragua, citing it as a model for community management of watershed while ensuring poverty reduction. The programme supports ecosystem rehabilitation in the programme sites, with the involvement of relevant local institutions and extension services. Communities were engaged in the designation of conservation areas since the beginning. The choice of the micro-watersheds to implement activities was based on the analysis of previous initiatives in the area and the importance of its water issues. Recharge zones have been identified, as well as production areas, and Water Committees were created, responsible for disseminating good practices. The National Climate Change Strategy had already identified adaptation actions. Adaptation plans have been developed and integrated in Municipal Development Plans. At the community level, beneficiaries had been considered “protagonists” rather than “beneficiaries”, taking ownership

throughout the identification, prioritization and implementation of the programme activities in line with the prevailing development model in Nicaragua.

40. However, although basic technology was available at the watershed level to generate climatic and hydrological information, there were generally some challenges related to the collection of that information. Baseline information on hydrological resources is still to be assessed and there is a need to build a hydrological balance model with estimates of the future distribution of rainfall under climate scenarios, for a better assessment of potential flooding and drought areas. In areas devastated by Hurricane Mitch in 1998, a topographic assessment had just been scheduled.

Representatives of the Nicaraguan Institute of Territorial Studies (INETER)

41. INETER comprises 6 technical departments including the meteorological services, the departments of hydrological resources, cartography and land use planning. The institute's expected inputs to this programme include territorial diagnosis, assessment of spatial and temporal distribution of water resources, hydrological studies in the watershed area and climate information to support decision for putting in place water retention and early warning systems. The hydrological studies of the target watershed are expected to be finalized by March 2014 and will allow a better assessment of the hydrological balance of the watershed.

42. However, it was acknowledged that the country was in a period of transition in terms of collection and use of climate information. The current network of rainfall stations was mostly composed of conventional stations and many had been damaged in Hurricane Mitch. Climate scenarios were currently relying on values by default following IPCC methodologies. There are few satellite stations distributed in the country with a databank but no information system has been established yet, although there are current plans to build such a system in the future. It is also expected that this programme will help provide information to support decision for the dissemination of future hydro-agro-meteorological stations. Finally, the need for observatories located in watersheds representing the three ecological zones of the country was expressed, which would allow increasing satellite information and generate climate data and scenarios.

43. Representatives of INETER and MARENA explained that the programme had built on current efforts from the government to promote increased coordination among its institutions, and it was expected that the collaboration between INETER and MARENA would serve as a model for others. In the past, planning was done only at the department and administration level, although the Territorial Law mentions the need to plan at the watershed level. This programme had supported the change of model through the development of watershed and sub-watershed planning tools.

National Water Authority (ANA)

44. The Department of Watershed Planning of ANA and MANERA had signed an agreement to design a planning program at the watershed level and implement afterwards eight micro-watersheds management plans. The authority registers Water Committees, assesses their capacities and develops plans to build or strengthen those capacities. It has received support from the Global Environmental Facility (GEF) Special Climate Change Fund (SCCF) through a project implemented by the World Bank, which deals with water supply and sanitation but supported water management plans and the creation of water committees in other regions in Nicaragua. The SCCF project will also strengthen the information systems on climate change adaptation in the water supply and sanitation sector at the national level.

45. The main challenges encountered by ANA included (i) the lack of information on available subterranean or superficial water resources, which could help support decision on investments in water retention or harvesting infrastructures, or decision on the right balance between drinking water and water for agriculture; (ii) the relatively low presence of protagonists in Committee meetings as compared to the project at large and (iii) the low level of capacities.

Ministry of Family, Community, Cooperative and Associative Economy (MEFCCA)

46. MEFCCA's activities are complementary to those of the programme in its areas of intervention and they target the same groups of stakeholders in some cases. Those activities include food security and climate change. MEFCCA was involved in the execution of the UNDP-GEF Sustainable Land Management project and another International Fund for Agricultural Development (IFAD) project, which are both complementary to the Adaptation Fund programme. At the department level, the extension services of the Ministry collaborate with those of other Ministries, under the Production, Consumption and Trading Cabinets, which are also replicated at the municipal level. The main objective of MEFCCA is to ensure that agricultural strategies take into account food security dimension. MARENA, on the other hand, provides MEFCCA with information related to climate change. The added value of the programme, according to MEFCCA representatives, was the increased availability of water for agriculture, through the irrigation works, hence providing families with the possibility to sustain their livelihoods from agriculture and increase their revenues at the same time.

47. One of the recommendations of MEFCCA representatives was that the programme or any future similar initiative should broaden the scope of the stakeholders during capacity building activities. According to them, all the actors involved at the micro-watershed level should be considered as "protagonists" and therefore should benefit from capacity building initiatives especially as those actors have usually more financial resources than the ones targeted by the programme, which will support scaling up and sustainability of results achieved through the programme.

UNDP Country Office

48. The mission team met with Mr Pablo Mandeville, Resident Representative of UNDP in Nicaragua and Ms. María Fernanda Sánchez, Programme Officer, Environment, Energy and Risk Management. UNDP representatives explained the history of the Adaptation Fund programme and its articulation with other initiatives implemented by UNDP. The programme had built on previous experiences in the country including a UNDP/GEF SLM project completed in December 2011, which promoted systems of water sharing and governance at local level. They emphasized the receptiveness of communities to innovation at the local level. The programme was also learning from an UNDP project under implementation, the Territorial Approach to Climate Change project, which integrates adaptation and mitigation strategies and planning at the territorial level. It was noted that there was a need for increased capacity building at the municipal level in order to attract climate finance. Overall, the programme was considered to be on a good track to achieve its objective, despite the capacity and financial challenges identified, which relate to the scaling up and sustainability of its expected results.

Site visits

49. Following meetings with government institutions based in Managua, the mission visited the three municipalities targeted by the programme, covering Estero Real River watershed including the municipalities of Achuapa, El Sauce and Villanueva.

El Sauce

50. The mission met with the municipal team chaired by the Mayor of El Sauce. The main sources of revenues in El Sauce are related to tourism, handicraft and agriculture, especially organic coffee. Through the programme, two irrigation systems are being developed to ensure food security and increase revenues of 350 families. These activities had received lot of support from the protagonists who had seen concrete benefits. It is expected that a municipal early warning system (EWS) will be developed through this programme. The community-level stakeholders involved included cooperatives, water committees and water users committees.

51. An operational coordination mechanism exists at the municipal level, involving the municipality and government extension services. A unique model is applied at national, departmental and municipal levels, based on the three principles of “Christianity, socialism and solidarity” under the “Alliance for Prosperity”. Through this model, all citizens are expected to be involved in matters of public interest and, in case of their benefiting from initiatives such as this programme, their role would go beyond that of beneficiaries, but should also be that of partners or active stakeholders in the activities they are benefitting from.

52. The problem of water management is considered a complex issue which is not expected to be fully addressed by this programme alone. Demand for water is considerable and there are regulations on water use and systems of water distribution in place, involving multiple stakeholders including farmer cooperatives. Communities were involved in any new initiative since the design phase, to avoid conflicts. Representatives of the municipality explained that they were exploring systems for payment of water and were planning to draft a strategy to ensure the sustainability of the programme assets. Also, the municipality has developed a Municipal Climate Change Adaptation Plan through this programme, and an Environment Officer from the municipality had developed training material on climate change with MARENA, for the staff and protagonists of the programme.

53. Following the meeting with the municipality, the mission visited some of the infrastructures built through this programme and met with some beneficiaries. These included the two communal irrigation systems in Las Mercedes and Salale, which will benefit more than 100 farm families. It also visited the Valverde-Castillo family, one of the beneficiaries of the programme through the establishment of a Farm Agro-ecological Transformation Plan (FATP). In total, 920 FATPs have been formulated and completed with the beneficiaries. Of these, 840 are being implemented, starting with the delivery of supplies and plants. When the FATP is completed, the beneficiaries sign a Solidarity Agreement with the Ministry of the Environment, whereby they commit to implement the plan they have formulated together with the programme technicians. The farms have been geo-referenced. The plans also include investments for special productive activities to be carried out by women, in their patios, such as the construction of chicken coops, pigpens or improved stoves.

Image 8 – Small-scale water infrastructure works serve to increase the resilience of agricultural livelihoods through increased water availability for irrigation of plots of smallholder farmers

Image 9 – One of 920 'protagonists' whose household participated in the development of Farm Agro-ecological Transformation Plans, each of which has specific adaptation actions to undertake on each farm and the commitment of households to deliver on the planned actions

54. To collect weather information, one conventional rainfall station was installed in Las Mercedes area, monitored by a member of the community. The communities were strongly involved in the development of FATP Investment Plans at the micro-watershed level, as

evidenced by their contribution to the design of the plans, their pledging to undertake specific activities and their involvement in the management of a weather information system.

Villanueva

55. The mission team visited the municipality of Villanueva and met with the Mayor, his team and representatives of extension services and communities. The Mayor explained that the youth, the political secretariat and the council were all involved in the programme since its identification. The main climate threat identified in Villanueva was related to flooding, with around 40,000 hectares of agro-silvo-pastoral systems affected across municipalities beyond Villanueva. The programme had, in response, supported the construction of ponds, water retention and irrigation systems and activities of reforestation which will help reduce flooding and at the same time increase revenues of the most vulnerable farmers. The municipality had coordinated the activities of this and other projects as well, which had improved coordination mechanisms at the municipality level, among technicians from different sectors, and improved water management capacities. Also, neighboring municipalities were associated in the activities of the programme aiming at addressing the shared flooding threat.

56. A flood threat study of Rio Villanueva watershed was undertaken as part of the programme and has provided solutions that may be implemented in the future. Overall, it is expected that this programme will support the establishment of a long-term vision for the management of the micro-watershed. Also, the studies undertaken so far have proposed reforestation works upstream and the municipality has therefore planned to build a plant nursery to support such works.

57. Following the meeting in the municipality, the mission visited the farm of Mr Leonardo Rocha, one of the programme's beneficiaries, who was supported through the establishment of fire breaks, water retention infrastructures and support in putting in place sustainable, less destructive agro-silvo-pastoral practices. The farmer had also received training in climate change issues and had been supported in the development of a FATP. This had allowed him to have an understanding of the water recharge function of trees and the importance of preserving them. His farm had been used as site of reference by the programme, for demonstration to other farmers of good agro-silvo-pastoral practices and water management. The farmer's wife, along with other families, had been supported through the programme with an improved cook stove which will help reduce deforestation, protect the water supply and have health benefits.

58. Finally, the mission visited an information system managed by the communities, which collected climate information including data on rainfall, temperature and fire risk.

Achuapa

59. The last municipality visited by the mission was Achuapa, where it was greeted by representatives of the municipality, extension services and community associations including the youth. Achuapa is located in the elevated areas which are the source of the Rio Grande and therefore must be protected and reforested to maintain their water recharge function. The main programme activities in that area are forest management and reforestation. As in the other sites of the programme, the municipality works with selected beneficiaries and ensures coordination and synergies between this and other initiatives in the area. It also allocates five percent of its budget in environmental activities. The coordination committee meets on a weekly basis to plan with MARENA, INAFOR (National Forestry Institute) and MAGFOR (Ministry of Agriculture and Forestry). Through the programme, the municipality had built its capacities in water

management and climate change adaptation. Its main challenge ahead is to raise awareness of the communities. A micro-watershed committee was created, in charge among other things with assessing water quality.

60. As an example of integrated agro-forestry management, the mission visited the farm of the Bravo-Martinez family. The farmer was trained through this and previous projects including the *Escuela Radiofónica*, and was very knowledgeable of climate change issues and the benefits of the best horticultural and agro-forestry practices introduced to his farm through the programme and its FATP. These included hedgerows, tracing contour lines to allow for better water retention and reduce soil erosion, introduction of fruit trees, management and filtering of grey water for use in agriculture.

Closing meeting and conclusions

61. The closing meeting at the premises of MARENA, with the presence of representatives of the Ministry, MEFCCA, INETER, ANA, the municipalities visited by the mission and UNDP, gave the opportunity to the Designated Authority of the Fund in Nicaragua and the Vice-Minister of MARENA to reiterate the strong commitment of the government and to emphasize the sense of ownership and responsibility of the Ministry and the beneficiaries. They said that the programme had received and will continue to receive a remarkable support from the extension services. The representatives of UNDP and the Adaptation Fund Board secretariat made a few preliminary recommendations after summarizing the mission visits and findings. They emphasized the need to improve access to resources or credit to the most vulnerable beneficiaries and took the example of the Small Grant Programme implemented by UNDP in the country as a means to support those communities. They also emphasized the need to strengthen and extend the existing climate information system including through increasing the number of agro-meteorological stations, which would support planning and decision making for replication and sustainability. Such an information system could be strengthened by linking climate and scientific information with local observations at the watershed level, which would allow for planning adaptation measures accordingly. To conclude, it was acknowledged that the programme had achieved substantial progress so far and it was suggested that its communication services and products be improved and tailored to various audiences.

IV. Lessons learned

62. The following lessons learned from the mission, although specific to the countries visited and to the water management sector, could apply to most of Central American countries and other developing countries beyond that region, and in some cases, other development sectors.

Mainstreaming climate change adaptation into water management plans

63. The mission had witnessed two approaches of planning for water management and including the climate change dimension into those plans. In the case of Honduras, under the context of urban planning, the project has supported a coordinated and well informed water planning system, with climate information collected from a network of agro-meteorological stations, and included in regional development plans, sectoral and national plans. This had been done thanks to improved collaboration among the relevant institutions through this project. The multitude of institutions involved could also be a challenge in terms of making available digestible, concise information to decision makers and end users. Hence the need to systematize and harmonize the set of planning tools and climate information developed by the relevant institutions, and tailor those tools to the needs of target groups, i.e. decision making for

urban planning, large water retention infrastructure investment, disaster risk management or investment in small scale agricultural infrastructures. In the particular case of Honduras, given the important water deficit in the densely populated capital city, such tools will be very critical for the government to make the case for future large scale investments from national, bilateral and multilateral, public and private sources, in water retention infrastructures and water distribution services, in order to address the existing infrastructure deficit that prevents the city dealing adequately with present climate variability.

64. In Nicaragua, climate change adaptation issues had been mainstreamed into a participatory and decentralized development planning system, with communities playing not only a role of beneficiaries but collecting and analyzing relevant climate information as well, supported by municipalities and government extension services. However, watershed management and, more generally, development planning decision making at the local level could gain from an upgraded set of climate information and decision tools, while at the national level a cross-sectoral climate information system could support water management policies, plans and investments that would help scaling up best practices and experiences achieved at the local level.

65. Although "soft measures", i.e. climate information, water policies and planning, are a prerequisite for effectively informing investments in concrete adaptation actions, realities on the ground through express intervention needs and lack of sophisticated instruments do not always allow for a fully functional national or local climate information and decision making system. Therefore, it is common for developing countries to balance the need for more accuracy in climate data to inform future changes and adaptation options, with the urgency of actions in areas with critical water related issues, including flood prone neighborhoods, small scale farms, or urban habitats with acute water deficit. To overcome this challenge over time, there is a need for improved investment in climate information and water planning systems to aid decision-making.

66. Despite both projects focusing on the water sector, there were notable differences in the challenges in adaptation in the rural and urban contexts. The intervention sites in the Nicaragua project were remote from the capital city, which may have been a contributing factor to the high decentralization of execution to government services in rural areas. The densely populated urban milieu in Honduras poses particular challenges for adaptation, namely violence in impoverished areas, the continual movement of slopes despite ongoing stabilization and risk reduction works, and an apparent infrastructure deficit where water scarcity is the norm and urban communities are not sufficiently adapted to current climate variability. The scale of the problem, in each case, is evidently too vast to be overcome fully through a project-based intervention of the scale funded through the Adaptation Fund. The interventions, accordingly, seek to demonstrate pilot solutions with immediate benefits for highly vulnerable communities. Attention must subsequently focus on how these are financially sustained and scaled out to other vulnerable communities with additional financial resources.

Institutional arrangements and implementation

67. In both Honduras and Nicaragua, the mission has seen a strong involvement and ownership from the government executing entity and partners. The MIE, UNDP in these cases, has played a role of financial management of the Adaptation Fund resources, support in meeting the requirements of the Fund and technical backstopping when needed, especially in the case of Honduras where at the time of the project approval, adaptation to climate change

was barely on the national agenda, hence the important share of soft adaptation measures in the project. In the case of Nicaragua, the decentralization of the implementation of the programme was very noticeable, so was the high level of ownership from the beneficiaries, so-called “protagonists”. In Honduras, there was a high level of coordination with many institutions involved in water or climate related planning or implementation of activities, including the scientific and academic community through UNAH. This had triggered new habits of collaboration between entities and had demonstrated the benefits of doing so through cross-learning, creating synergies and knowledge sharing. In both cases, existing implementation arrangements should facilitate future scaling up of water management pilot activities. However, additional stakeholders could be engaged with, especially financial partners, either public or private, to support the implementation of local and national government plans as well as community investments, through small or large scale infrastructures, offer of credit, climate risk insurance, water fees, payment for watershed services or other innovative financial solutions

68. On the involvement of the academic community, the university considered that the involvement of students, faculty and graduates had been of immense value to the country’s efforts in adaptation by providing practical training the next generation of adaptation practitioners. As a lesson learned, it would have been beneficial to think from the start how academia could have played a role both in design and construction, rather than just the design part. This could have provided continuity to the participative approach where the students had been accompanying the community members over an extended period and gained their trust in producing designs that reflected their needs. Moreover, the process of technical verification and design iteration should be one that is in place from the start, and should accompany the design process throughout, rather than be undertaken *ex-post*. This would ensure that the process is completed in a timelier manner and that the students’ efforts in design are not an unnecessary expense of resources that need to be repeated at a later stage. The director of the civil engineering department remarked that there was a clear multiplier effect where they had started off at modest scale, but through the project to date they had trained a new cadre of professionals with the technical expertise to address the pressing adaptation challenges facing Honduras. From the municipal government perspective, the involvement of the engineering students and graduates had added a valuable accompaniment to the community members’ participation in the design of the works, through their regular interactions during scoping and survey visits to the sites of intervention. Participation of the community members had been high, particularly with women, who had provided inputs on the priorities for design of the proposed works. The municipality recognized that the students and graduates had obtained valuable professional experience on adaptation and design of appropriate community-level infrastructure.

69. Collecting and analyzing climate information and effectively integrating them into water management planning requires effective coordination among the relevant government institutions, the scientific community and other stakeholders involved in water related issues at the national level, and among local governments, extension services of government institutions and communities, at the local level. Water management, as a cross cutting issue, provides a good opportunity for national and local institutions to enhance their collaboration mechanisms.

70. It is recommended to include public and private financial partners in the design and implementation of water management plans at the local and national level, in order to ensure future scale up and sustainability of pilot actions.

The adequacy of Adaptation Fund review criteria, at project implementation stage

71. The projects have followed the implementation arrangements as presented at the proposal stage. There have been slight changes and readjustments in the proposed activities in both cases, but they did not affect any of the projects' outcomes. The projects have also taken into account cost-effectiveness and have seized opportunities to save costs during implementation, while targeting a larger number of beneficiaries. The mission had also witnessed that the two projects had built on and were collaborating with previous and current relevant initiatives, including the GEF SLM project and *Escuela Radiofonica* in Nicaragua.

72. Although gender issues were not part of review criteria at the time of the approval of these projects, there was an important gender element in both. The issue of sustainability was also not part of the review criteria at the time of project approval. Therefore, project proponents did not provide in the fully-developed proposal approved by the Board a description of how the projects intended to set the foundations for ensuring the sustainability of the proposed interventions. During the mission, it was observed that the design of both projects had integrated the issue of sustainability, with a high level of ownership of the central and local government, as well as communities (especially in Nicaragua), integration in the regional development plans and water policies, and enhanced capacities at the institutional and community level. Nevertheless, in both projects the financial sustainability of the interventions was still not secured or demonstrated. Orientations from the upcoming mid-term reviews could provide a good opportunity to explore strategies and innovative approaches to ensure sustainable financing of water related infrastructures.

73. During implementation, the projects have generally been consistent with the proposals reviewed by the secretariat and approved by the Board. Although gender inclusion and sustainability were not part of the criteria at the time of the projects' approval, they have been fully taken into account during implementation, although both projects would need to enhance their approach to financial sustainability by the time of their completion.

ANNEX 1: Planning of the mission in Honduras

Propuesta de Agenda para Visita de Misión del Fondo de Adaptación/GEF

4 al 8 de Noviembre 2013

Coordinación y acompañamiento:

Irene Ortega (DNCC/SERNA) – Nelson Ulloa (PFACC/PNUD), Sandra Buitrago (PNUD), Noelia Jover (PNUD).

Fecha	Hora	Actividad	Lugar	Responsable	Objetivo
Lunes 4	9:00 - 10:00	Reunión PNUD con el Señor Edo Stork Representante Residente a.i.	PNUD	Sandra Buitrago	Dar la bienvenida a la misión y hablar sobre el contexto de implementación del proyecto y el papel del PNUD. Aportar a la respuesta del objetivo 3 de los TOR.
	10:30-12:30	Reunión c/ DNCC/SERNA con el Director Nacional de Cambio Climático Sr. Manuel López Luna y el punto focal del Proyecto la Sra. Irene Ortega.	DNCC	Irene Ortega – Ana Karina Cáceres	Explicar el contexto de ejecución del proyecto, retos, dificultades y prioridad de la Dirección de Cambio Climático para la transición del coordinador y mejoras a la implementación. Aportar a la respuesta del objetivo

					3 de los TOR.
	2:00 - 3:00	Reunión Dr. Cuellar (ex Ministro SERNA)	Por Confirmar	Sandra Buitrago	Experiencia ejecución del PFACC/SERNA. Aportar a la respuesta del objetivo 3 de los TOR.
	2:00 - 3:00	Reunión c/Abogada Irina Pineda	Por Confirmar	Sandra Buitrago	Experiencia ejecución del PFACC/SERNA. Aportar a la respuesta del objetivo 3 de los TOR.
	4:00 - 5:00	Cierre visitas	PNUD	Sandra Buitrago	
Martes 5	09:00 - 10:00	Reunión SANAA (como integrante de la Red Meteorológica Nacional)	SANAA/Los Filtros	Lizeth Gómez	Presentar mapa ubicación estaciones meteorológicas. Aportar a la respuesta de los objetivos 2 y 3 de los TOR.
	10:00 - 12:00	Gira Represa Concepción	Represa Concepción	Lizeth Gómez	Visitar ubicación estaciones meteorológicas Aportar a la respuesta de los objetivos 2 y 3 de los TOR.
	3:00 - 4:00	Reunión SMN	DGA	Lizeth Gómez	Conocer la integración sistema información meteorológica. Aportar a la respuesta de los objetivos 2 y 3 de los TOR.

Mi ercoles 6	09:00 - 10:30	Reunión c/SEPLAN	SEPLAN	Lizeth Gómez/ Christian Rossi	Presentación de resultados de planeación regional con enfoque de cuenca y adaptación al cambio climático. Demostración Productos y Plataformas Web SINIT y RENOT / PDR-OT (ACC). Aportar a la respuesta de los objetivos 1, 2 y 3 de los TOR.
	11:00 - 12:30	Reunión C/IHCIT-UNAH	UNAH	Lizeth Gómez	Presentación del Balance Hídrico – Diplomado CC. Aportar a la respuesta de los objetivos 1, 2 y 3 de los TOR.
	01:30- 3:00	Reunión Ing Civil/UNAH	UNAH	Milton Domínguez	Presentar Diseños y experiencia de obras ACC. Aportar a la respuesta de los objetivos 1, 2 y 3 de los TOR.
Jue ves 7	8:00 - 4pm	Reunión ICF-SANAA	Sub Cuenca de Río Guacerique (SCRG)	Milton Domínguez/ Christian Rossi	**Visitar SCRG** (Delimitación y rotulación micro cuencas – Consejo Sub cuenca - Uso optimizado agua en agricultura). Aportar a la respuesta de los objetivos 1, 2 y 3 de los TOR.
Vie rnes 8	08:00 - 10:00	Reunión AMDC	AMDC	Milton	Presentar enfoque de intervención en colonias vulnerables. Aportar a la respuesta de los objetivos 1, 2 y 3 de los TOR.
	10:00 -	Reunión con el Comité nacional	SERNA	Irene Ortega	Tener un diálogo sobre las

	12:00	de cambio climático			transformaciones y cambios en el país a partir del proyecto, arreglos institucionales y participación de actores de sociedad civil, conformación del Comité y valoración sobre su implementación. Aportar a la respuesta de los objetivos 1, 2 y 3 de los TOR.
	02:00 - 03:00	Cierre propuesta por la delegación visitante	SERNA	Irene Ortega	Cierre de la misión, conclusiones y recomendaciones para el PNUD como agencia implementadora y la SERNA como asociado en la implementación.

ANNEX 2: Planning of the mission in Nicaragua

Programa "REDUCCION DE RIESGOS Y VULNERABILIDAD ANTE INUNDACIONES Y SEQUÍAS EN LA CUENCA DEL RÍO ESTERO REAL"

Proyecto NIC-10-00074925

AGENDA PARA VISITA DEL FONDO DE ADAPTACION

Noviembre 11-15, 2013

FECHA	HORA	VISITA
Lunes 11	9:00 – 10:00 AM	Reunión con la Dirección Superior MARENA, Delegados Territoriales MARENA León y Chinandega, Equipo Técnico del Programa Estero Real y consultores
	10:30 - 11:30 AM	Reunión con el Instituto Nicaraguense de Estudios Territoriales (INETER)
	12:00 – 1:00 PM	Reunión con la Autoridad Nacional del Agua (ANA)
	1:00-2:00 PM	Almuerzo
	2:30 – 3:30 PM	Reunión con el Ministerio de Economía Familiar, Comuntaria y Cooperativa (MECFCA)
	4:00 – 5:00 PM	Reunión con Reprsentante Residente PNUD
Martes 12	6:00 AM	Salida a El Sauce
	9:00 AM	Visita a la compañera Alcalde del Municipio de Sauce
	10:00 AM	Visita al Sistema de Riego Comunal Salale
	2:00 PM	Visita al Sistema de Riego Comunal Las Mercedes y al protagonista Neydar Valverde. Se verificará el sistema agroforestal con establecimiento de árboles frutales y granos básicos (maíz).
Miércoles 13	8:00 – 9:00 AM	Visita al compañero Alcalde del Municipio de Villanueva
	9:30 AM– 12:00 PM	Visita a Protagonista Leonardo Rocha, de la Comunidad de San Ramon, Municipio de Villanueva. Verificaremos una laguneta con capacidad de 900 metros cubicos,sistema silvopastoril con establecimiento de arboles forrejeros y arboles frutales.
Jueves 14	2:00 – 3:00 PM	Visita al compañero Alcalde del Municipio de Achuapa
	3:30 – 5:30 PM	Visita a Protagonistas: 1.Julia Guevara Martinez, Comunidad de El Rodeito, Municipio de Achuapa, por la tarde. Se verificará un sistema silvopastoril con establecimiento de árboles frutales, actividades compensatorias acequias, fogón mejorado, gallinero y chiquero establecidos. 2. Elvira Pérez Comunidad de El Rodeito, Municipio de Achuapa, Sistema Silvopastoril y bosque protegido de zonas

		riparias 3. Familia Calderón Comunidad de El Rodeito, Municipio de Achuapa, Sistema Agroforestal callejones mejorados 4. Las Brisas (Familia Bravo Martínez) Sistema Agroforestal (Granos básicos con arboles dispersos) (nos bajamos en Lagartillo y caminamos +- 10 minutos hasta la finca del protagonista.
Viernes 15	7:00 AM	Regreso a Managua
	11:00 AM	Reunión de cierre en MARENA
	12:30 PM	Almuezo
	3:30 PM	Salida al aeropuerto