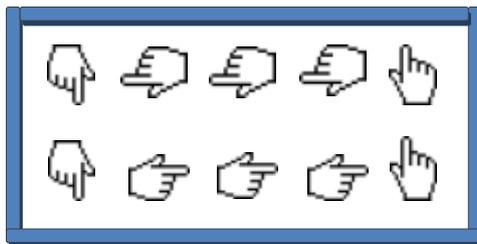


“From international to local: the role of coordination across institutions working on adaptation to climate change”

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Mexico has been recognized as highly vulnerable to climate impacts. Given that vulnerability is related to Country's development, Mexico has integrated climate change adaptation into the national development plan. But at the local level, where adaptation must be implemented, institutions still lack of capacity; moreover there is a need of institutional coordination across scales. This paper analyses the challenges that local institutions face to address adaptation to climate change, where local implementation should be supported by international and national frameworks. This paper argues that local institutions can take into account the relevant “UNFCCC's Cancun Adaptation Framework”, as a tool to create their own adaptation plans, developing their own capacities. This paper illustrates its arguments with the case study of the wetlands in Tampico, Mexico, where an alternative institutional structure could enhance its functions, and thereby facilitates the implementation of adaptation.

Key words: [adaptation](#), [coordination](#), [delegation](#), [framework](#), [institutional capacity](#).

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1. Introduction

This paper analyses current international frameworks proposed by the United Nations Framework Convention on Climate Change (UNFCCC); it outlines as well, Mexico's policy instruments to address adaptation to climate change at the National Level (NL). Finally it analyses the case study of Tampico (Tamaulipas, Mexico), where, due to the lack of climate change knowledge and understanding, Local Institutions (LI) instead of adapting, are maladapting, as they have removed coastal wetlands in order to build dykes in the lagoons' areas.

It is important to underline that, while mitigation is concerned with International Level (IL) and NL, adaptation is concerned with the State Level (SL) and Local Level (LL). In that case, this paper has explored the institutional frameworks across levels, to address adaptation to climate change, and why institutional coordination plays a key role to reduce vulnerability and to enhance adaptation measures.

Climate has always varied and societies and ecosystems have adapted themselves to these changes, without any planning, directed by some kind of human organization for a long time. In the current anthropological climate change, adaptation refers to the adjustments in the behaviour of a system that improve the ability to deal with extreme events caused by weather, and also seeks to reduce the vulnerability of populations and ecosystems. Adaptation, in this sense, refers to the adjustments in the integral behaviour of a population and not only in infrastructure systems (as commonly occurs with hard adaptation), but in social and institutional behaviour.

Adaptation can be considered as a measure, as policy, as development strategies and as investments, among others. Adaptation definition is very broad and in turn, this conceptual ambiguity is deficient in clarity on its own practice. Adaptation is performed according to the degree of vulnerability of people and ecosystems.

Researchers at the Institute for Environment in Stockholm are more focused on *human adaptation*, referring to this as "the adjustments in the system behaviour and characteristics that enhance their ability to make against external concerns, adaptation has to take place against a background of constant change related to processes of internal contradiction and to the impacts of external or contextual factors" (Christoplos *et al.*, 2009: 7).

To define vulnerability in an institutional manner, Neil Adger *et al* stated: "vulnerability is a socially constructed phenomenon influenced by institutional and economic dynamics" (2003: 181). Vulnerability should not be considered a synonym of poverty, but it exacerbates any other stress, bringing on other vulnerabilities and fragility in society, decreasing the ability to react to climate-related events, making people more susceptible to disasters. Therefore, institutions must be strong enough to support and react to various climate-related events.

At this point, it is important to mention that there is always a risk, that at some point any strategy does not achieve the expected adaptation measures and its outcomes result the opposite, then this is called maladaptation. Maladaptation refers to "those actions which tend to increase vulnerability to climate change (Burton, Smith and Lenhart, 2003: 4). Typical examples of ecosystem not well adapted are the wetlands.

The degradation of coastal wetlands by changing land use and management of freshwater reduces the ability to provide their services, that are important to tackle climate change and reduce risks and vulnerability. For example, the construction of dams, dykes and levees in wetland areas, is neglecting wetlands' contributions.

Mexico is a country highly vulnerable to climate change impacts. Its geographical location, *de facto* entails extreme climate-related events. It is surrounded by two oceans, seas and gulfs, where cyclones and hurricanes occur very often. There are another natural factors which expose the country climate risks, such as its richness in biodiversity, as it hosts all of the ecosystems existing on Earth planet (except for the tundra), and that is also a huge responsibility for the world.

The coastal wetlands of the Gulf of Mexico, in particular mangroves, can reduce a storm surge and wind strength during cyclones and hurricanes, minimizing damages to people and their properties. One problem identified as maladaptation is the absence of coordination between institutions, because National Institutions (NI) are responsible to delegate climate change knowledge, assess impacts and vulnerability in local areas and to promote the use of international cooperation to assist to implement adaptation projects.

2. Frameworks on adaptation to climate change at the UNFCCC

In most of cases in the world, climate change has negative impacts over ecosystems and populations. Many countries are facing severe water shortages, floods, droughts, hurricanes, heat waves and sea level rise. These disasters are increasingly frequent, leading to water scarcity, diseases, epidemics, poverty, migration and environmental refugees, and these consequences are becoming more and more severe.

The institutionalization of climate change emerged from the identification of the international environmental crisis, in order to make a global change in the way people use, manage, and conserve natural resources and to reduce the impacts caused by past, present and future climate-related disasters.

While the adverse effects of climate change are affecting the entire planet, developing countries have fewer resources to invest in adaptation, their economies usually depend directly on local ecosystems and their technologies are not appropriate to cope with climate-related events, or to reduce emissions. These countries are more vulnerable because they have limited financial and technological resources, as well as limited institutional capacities and require support from the international cooperation.

Humans not only adapt to the different characteristics of nature, water, land and cultivation, among others, but the institutions also adjust, such as, labour markets, governments, schools, and even religions adjust as well. The institutions are furthermore part of society, changing over time and space, according to varied issues, and therefore are subject to adaptation. In this context, there is an urgent need to provide an integrated policy, considering the support of international frameworks to implement strategies, coordinated at all government levels.

The International Regime on Climate Change (IRCC), mainly institutionalized by the UNFCCC has identified adaptation as one of the two main strategies to cope with the adverse effects of climate change.²

The article by R. Keohane and David Victor on "*the complexity of the climate change regime*" explains how states construct international regimes according to their own interests under conditions of complex interdependence. They state that: "The weighting of these interests in determining international outcomes depends on the power resources, relevant to the issue-area, that are available to the states involved" (2010: 3).

Since the initial draft of the UNFCCC, Article 4-b, calls for the need to include measures for adaptation to climate change. It remarks to: "Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change" (UNFCCC, 2007-a: 11).

In order to address adaptation at the IRCC, IL, UNFCCC and the recent Cancun Adaptation Framework (CAF), it is pertinent to note the adaptation concept quoted by the Intergovernmental Panel on Climate Change (IPCC), which defines adaptation as: "the adjustment in the natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC, 2007: 79).

The CAF has introduced important development working issues, as mandatory to consider, such as the gender perspective and the ecosystem approach, within a robust policy structure, trying to approach a wide concept and actions for adaptation to climate change. The CAF clearly underlines the importance of institutions for adaptation: "strengthening institutional capacities and enabling environments for adaptation, including for climate-resilient development and vulnerability reduction (including in the areas of water resources; health; agriculture and food security; infrastructure; socioeconomic activities; terrestrial, freshwater and marine ecosystems; and coastal zones)".³

The CAF emphasizes the importance of improve institutional capacities, it: "acknowledges the need to strengthen, enhance, and better utilize existing institutional arrangements and expertise under the Convention, emphasizing the institutional arrangements under the

² The IRCC was formed over the neo-institutionalism theories, which basis are formulated on the creation and "good performance" of their institutions.

³ <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=4>

Convention and inviting parties to strengthen and, where necessary, establish and/or designate national-level institutional arrangements, with a view to enhancing work on the full range of adaptation actions, from planning to implementation”.⁴ In this regard, the CAF is a platform to address adaptation to climate change across scales and facilitates governments to implement at NL, SL, and LL.⁵

The UNFCCC Secretariat works over Mandates issued by the Conference of the Parties (COP). In adaptation terms, an important outcome of COP 13 in Bali was the Bali Action Plan (BAP). The BAP identified adaptation as “one of the key building blocks required for a strengthened future response to climate change to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012”.⁶

The BAP addresses climate change, based on the principle that industrialized countries are mostly responsible for current anthropogenic climate change; therefore they must provide financial resources to developing countries. To support the efforts of developing countries to reduce their Green House Gases emissions and reduce the risks caused by climatic events through adaptation, the PAB requests for targets, particularly the urgent need to integrate adaptation in national development programs. The BAP clearly called for enhanced action on adaptation⁷

In 2005 the Nairobi Work Programme was established by the UNFCCC to help all parties, in particular developing countries to improve their understanding and assessment of impacts, vulnerability and adaptation to climate change (including the least developed countries and small island developing states). The NWP also seeks to deliver information, to advocate vulnerable countries across scales, and to achieve practical and effective adaptation to climate change.⁸

These UNFCCC’s instruments have been designed during COP Summits and other meetings, and they have financed by the international cooperation to offer support mainly to developing countries in accordance to the UNFCCC principles.⁹ On the one hand, almost

⁴ <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=4>

⁵ In many cases, LI in developing countries lack vulnerability assessments and impacts, and in general of climate change knowledge.

⁶ <http://unfccc.int/adaptation/items/4159.php>

⁷ The BAP remarks on: “international cooperation to support urgent implementation of adaptation actions, including through vulnerability assessments, prioritization of actions, financial needs assessments, capacity-building and response strategies, integration of adaptation actions into sectoral and national planning, specific projects and programmes, means to incentivize the implementation of adaptation actions, and other ways to enable climate-resilient development and reduce vulnerability of all Parties, taking into account the urgent and immediate needs of developing countries that are particularly vulnerable to the adverse effects of climate change, especially the least developed countries and small island developing States, and further taking into account the needs of countries”. <http://unfccc.int/adaptation/items/4159.php>

⁸ The NWP works over nine areas: 1) Methods and tools; 2. Data and observations; 3) Climate modelling; scenarios and downscaling; 4) Climate related risks and extreme events; 5) Socio-economic information; 6) Adaptation planning and practices; 7) Research; 8) Technologies for adaptation; and 9. Economic diversification.

⁹ “The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade”. (http://unfccc.int/essential_background/convention/background/items/1355.php).

all developed countries are already working dynamically on adaptation and considering risk and vulnerability to climate change in all development plans and projects. Adaptation should be part of any countries' individual development, as each country faces impacts in different degrees and institutions create their rules according to national needs.

Given that, LI in developing countries often ignore about international frameworks, national governments must delegate the knowledge, best practices, measures elaborated at the IL to the SL and LL. However, throughout the delegation process institutions implement commonly go unarticulated.

Considering the capacities of each country and taking into account the "Capability Approach", proposed by Amartya Sen, countries must adapt themselves as part of their own development, arguing that: "development should be viewed as a process of expanding the real freedom of people, consists in the person's capability to achieve valuable human performance" (Sen, 2000: 22).

Due to the high level of uncertainty, to date incorporating climate change adaptation into development programmes, in developing countries, is increasingly discussed. With this regard, Eriksen and Brown stated: "today there is no certainty that our responses to climate change are sustainable, either socially or environmentally, nor how they are likely to contribute to human well-being and poverty alleviation" (2011: 1). Then, developing countries still face the major challenge.

Sir Nicholas Stern on his report mentioned: "the development itself is crucial for adaptation. Much of the adaptation should be an extension of good development practices to reduce vulnerability through: 1) promoting growth and economic diversification; 2) investing in health and education; 3) increasing the resilience to disasters and improve their management; 4) promoting prevention through risk reserves including social safety nets for the poorest (Stern, 2006: 319)".

Adaptation, in these senses requires the participation of many international actors and at all government levels, considering participation of the LL and based on its particular needs. Thus national governments are responsible for institutional support at the LL, facilitating the appropriation of adaptation projects by local people and in turn, ensuring accountability of all actors in the short, middle and long term. The example exposed on this paper analyses the management of coastal wetlands carried on by LI in Tampico, Mexico.¹⁰

3. Addressing adaptation at the NL in Mexico.

Mexico has adopted recommendations from international frameworks to address adaptation to climate change, according to its key position as developed and developing

¹⁰ This ecosystem is important for the global biodiversity, is a source of local food, resources and employment for local communities. Wetlands also contribute as an outstanding adaptation measure, acting as a container barrier for hurricanes and cyclones and preventing coastal erosion.

country.¹¹ Notably, the country became among the first Parties of the UNFCCC, the Convention on Biological Diversity, the Convention on Desertification, the Ramsar Convention (Protection of Wetlands), and is also a Party of the Montreal Protocol and the UNFCCC's Kyoto Protocol. This has demonstrated the traditional participation of Mexico on environment international affairs. Nevertheless, at the NL, SL and LL, Mexico faces enormous internal challenges regarding climate change adaptation (and mitigation).¹²

In 2005, under the UNFCCC negotiations, the Mexican Government created the Inter-Ministerial Commission on Climate Change (IMCCC), composed by Ministries, to which climate change concern. The IMCCC was initially intended to contribute to the evaluation and design of policies in relation to climate change by institutions involved and achieving common agreements between them, but the IMCCC hardly meet, misplacing continuity and progress and it really doesn't approach adaption.

In 2006, in compliance with international agreements, Mexico included in the National Development Plan 2007-2012 (NDP 2007-2012), climate change within its themes, setting guidelines to undertake mitigation and adaptation measures. Chronologically in May 2007, to follow guidelines of action, the Mexican government elaborated the National Strategy on Climate Change (NSCC), which includes elements to establish guidelines for adaptation (and mitigation). The NSCC includes a framework which coordinates strategies on adaptation, although it was underestimated by mitigation.

Finally in 2009, the Mexican national government launched the Special Programme on Climate Change (SPCC). The SPCC is the core document that identifies the vulnerability, strategies and economic opportunities to address climate change impacts in Mexico. In the same year, the Government issued a report on the costs of climate change in Mexico, also called *Galindo* Report.

In addition to these instruments, Mexico has already published its Fourth National Communication to the UNFCCC and currently is working on the Fifth. At present there is a debate over the project of the Law on Climate Change, this project certainly approaches adaptation measures, and will lead the legal structure to implement at NL and taking into account international agreements.

These instruments have been created by groups of experts from different disciplines, committed to address this problem and prove to be a breakthrough; but the problem is that these efforts are reflected only at the NL. Thus, at the SL and LL the institutions still lack legal frameworks and strategies to implement adaptations projects. LI in Mexico frequently depend on the economic resources available, mainly provided by the national government.

¹¹ Mexico has been considered as a developing country grouped within the non-Annex I of the UNFCCC. However, Mexico is the 14th global economy, according to the World Bank data and is also part of the Organization for Economic Cooperation and Development, OECD.

¹² An important factor to note, with regard of climate change in Mexico is its high dependence on fossil fuels. According to the National Institute of Statistics and Geography in Mexico, INEGI: "about 88% of primary energy consumed in Mexico, comes from oil". This means large limitations for the country, particularly in terms of mitigation, that is an important reason to prioritize adaptation and consider this as investment opportunities for green technologies and alternative energy resources.

The author Robert Keohane has expressed that power will reflect an asymmetrical interdependence, then: “bargaining power will depend both on the impact of one’s own decisions on others (a reflection of size) and on favorable asymmetries in interdependence leading to better default (no-agreement) positions for the state” (Keohane 1984, quoted in R. Keohane and D. Victor 2010: 3).

Unfortunately, Mexican people are generally not aware of the impacts of present and future climate change and the adaptation needs, thus they often cope according to immediate needs. Moreover, adaptation strategies are designed over universal scenarios, thus implementation comes as maladaptation. In that sense, there is an urgent need of coordination and delegation appropriate tools for implementing adaptation measures at LL.

4. Local Intuitions in Tampico, Tamaulipas

The limits of adaptation in developing countries are unquestionably seen, as there are economic, social and institutional factors hard to achieve. At this point, the paper analyses case study on Tampico Tamaulipas, where LI have responded to climate impacts, but they hardly work in accordance to international frameworks, neither to the already made national plans, due to the absence of information in this regard.

Adaptation requires the participation of LI and so far, the Mexican government has designed legal instruments to address adaptation to climate change, however, at the LL (where adaptation is implemented) there is a large gap in regulatory climate change frameworks. This section analyses the institutional adaptive capacities in Tampico, Tamaulipas, located at the coasts of the Gulf of Mexico.

Tampico in Tamaulipas was chosen due to its peculiar characteristics. The city has a very high income, in accordance to the Mexican Municipalities rank, is an industrialised city, which hosts PEMEX refineries and oil platforms are very close, thus many companies had been based on there.¹³

Tampico is surrounded by rivers (Rio Panuco Tamesí River) and lagoons (*Chairel Lagoon, Carpintero Lagoon, Champayán Lagoon* and *Vega Escondida Lagoon*), covering over 47,000 hectares, housing a large number of wetlands, both salt and freshwater. The wetlands of the Gulf of Mexico, grant with services to facilitate the quality of life in Tampico.¹⁴

Wetlands have significantly contributed to the economy in the area and protecting people from extreme weather events, but due to this location and current climate impacts,

¹³ PEMEX is the Mexican oil company. “*Petroleos Mexicanos*” is the biggest enterprise in Mexico and Latin America and the highest fiscal contributor to the country. It is one of the few oil companies in the world that develops all the productive chain of the industry, upstream, downstream and final product commercialization”. <http://www.pemex.com/index.cfm?action=content§ionID=123>

¹⁴ A recent study undertook by the National Institute of Ecology, financed by the Global Environment Facility and the World Bank reported on the economic benefits of the wetlands in the Gulf of Mexico has appointed: “mangrove-related fish and crab (crab) represent 32% of the landings of small-scale fisheries in the region; those mangroves can be valued annually at \$ 37.500 per hectare” (Buenfil, 2009: 55).

Tampico is often exposed to cyclones, hurricanes, floods and landslides, where severe damages are constant.

Tampico was seriously damaged by intense floods in 1955, so NI and LI built a complex system of seven dykes which control the level of water and freshwater's management. These dykes have been working in a "proper manner", but in order to build them, the coastal wetlands were destroyed. Currently authorities are not permitted to remove wetlands from the lagoons and around the dykes, but they only consider this restriction as an environmental protection, not as an advantage for its services as natural tools for adaptation. While fishing, urban development, agriculture, shipping, oil and tourism industries have flourished in the region of the Gulf of Mexico, this has resulted in severe consequences for the ecosystem.

The main problem in Tampico is the lack of an institutional structure which gives protection, constancy, stability, sound management and conservation of wetlands. There is only one office in charge of "environment" activities, called "ecology office" and this one depends, as well, on the "*obras y ecología*", which also manages city's infrastructure. The problem is actually more serious because from the six offices that depend on this institution "*obras y ecología*", only one is in charge of "ecology" and, it is clearly known that climate change impacts exceed so far from the "ecology" matters. This research started on 2010, and municipality held elections by the end of the year, notably the institution did not change its structure, so competences remain the same.

During this research, representatives of the environmental office "*Ecología office*" in Tampico were interviewed. It was clear that they know the operation and functionality of the dykes and the importance of "good management", in addition they expressed concern over the lack of dredging in some areas, with the possibility of flooding and maintenance of certain lagoons. Although they know the vulnerability of the area, they barely know the effects of climate change. Moreover, their actions are more focused in the operation of the dykes, instead of preservation, management, and conservation of wetlands.

Major NL projects initially decided that canals, sluices, dams and water control systems were built to reduce flood risk in the city, surrounding agricultural areas and PEMEX oil plants and removing the wetlands. Under that approach LI formed their offices, and perhaps this structure allowed for long time the degradation of wetlands.

It is evident that the city lacks of coordination over institutional arrangements for adaptation measures, as they have not been trained and they were not been invited to collaborate in vulnerability assessments made by the NI. Since NI are responsible for the design of adaptation national measures, they should analyse Tampico's institutional structure, and invite LI to make adaptation (and mitigation) frameworks, and vulnerability assessments, considering international recommendations, such as the CAF.

The absence of an institutional framework and rules governing the adaptation measures delegated from NL creates stress in ecosystems and population. The IPCC notes that "the adaptive capacity is intimately connected with social and economic development, but not distributed equally among the societies and within them" (IPCC, 2007: 56). In this particular case, the economic constraints are not the main problem, but institutions' work.

From the above, it follows that this setback does not allow a clear identification of the specific tasks of each topic. It is well known that, in the past, public constructions were made prefixing ecosystems, without environmental impact studies, and therefore traditionally, these constructions we made without consider any damage to the environment as vital.

With the information exposed on this study we can infer that there is a tendency towards maladaptation. To avoid this maladaptation there must be an enhanced adaptation capacity, so Neil Adger says: "this is being undertaken in part through learning the lessons from present and past adaptations. These determinants include the social capital of societies, the flexibility, and innovation in the institutions of government and the private sector to grasp opportunities associated with climate change, and the underlying health status and wellbeing of individuals and groups faced with the impacts of climate change (Adger, 2001, quoted in Adger *et al* 2003: 186).

The lack of identification of the problem of climate change is reflected in the absence of a regulatory institutional framework. Although the national norm, "NOM-022-SEMARNAT-2003", sets the specifications for the preservation, conservation, sustainable use and restoration of coastal wetlands in mangrove areas, neither the city of Tampico, nor the State of Tamaulipas have a plan or strategy on climate change impacts.

This contrasts greatly with the situation at NL, since the NI have created several instruments and studies (SPCC, NSCC) that could be useful to LI. However, these instruments should place more emphasis on the institutional frameworks with the purpose of encourage and promote these measures. In a few words, the central problem is that there is a gap between government levels. Although Mexico has created various instruments in response of UNFCCC recommendations, NI must coordinate projects considering LI capacities and local needs, as part of the implementation of these instruments at the SL and LL.

Tampico to improve its own capacities, and not depending on the NI could consider the CAF, in order to: "support better planning and implementation of adaptation measures through increased financial and technical support, and through strengthening and/or establishing regional centres and networks. The framework will also boost research, assessments and technology cooperation on adaptation, as well as strengthen education and public awareness".¹⁵ It has been exposed that NI are not coordinating properly and many factors could be analysed, but this article examines evidently only local capacities.

To conclude, with regard to adaptation to climate change, the information contained in national instruments has not been entirely addressed at the LL, and these instruments are not being delegated precisely. This lack of coordination between national and local authorities also slows and hampers the process.

¹⁵ <http://cancun.unfccc.int/adaptation/>

5. Conclusions

It is noteworthy that any adaptation process has been made due to a previous harm, therefore adaptation to climate change will respond to the impacts of that damage, but it will never reduce the risk by 100%. Then institutions should guarantee the minimum risk, providing with certainty and stability in long term.

For this reason, development projects should avoid the "adaptation gap", which has been noted by Ian Burton as: "the gap between possible adaptation without policy nor additional projects and the necessary level to prevent side effects of climate change"(Burton quoted in Schipper, *et al.*, 2008: 8).

The UNFCCC Secretariat has been introducing more adaptation strategies over the discussion groups developing its own programmes, plans and now frameworks. The UNFCCC initially depended of individual mandates on adaptation, but the PAB included a framework of action with specific targets. In 2005, the NWP created a whole institutional structure, with working areas focused on specific sectors and action plans with detailed activities.

The CAF notes on the importance of the international cooperation to better cope with climate change impacts under institutional obligations, seeking to "support better planning and implementation of adaptation measures through increased financial and technical support, and through strengthening and/or establishing regional centres and networks. The framework will also boost research, assessments and technology cooperation on adaptation, as well as strengthen education and public awareness".¹⁶

However, the UNFCCC Secretariat does not implement projects directly, and then it is necessarily to elaborate coordinated policies between multi-level institutions. While UNFCCC programmes have progressed, coping strategies are very different in each developing country, costs vary according to the needs of each society, region, ecosystem, among other factors.

Mexico recently has achieved an important goal as Presidency of the COP16, leading remarkable outcomes agreed on the Cancun Agreements. The diplomatic leadership performed by the Foreign Affairs Ministry of Mexico, allowed negotiations to move forward in to a long-term global action and to recover trust in multilateral agreements on the climate change arena.

Mexico at the NL has significantly shown strong abilities to address and cope with climate change. The country has created different instruments, for instance: the NSCC, the SPCC, the *Galindo* Report, National Communications to the UNFCCC, and many other reports and assessments that evaluate the country's vulnerability and green business opportunities. However, Mexico is highly vulnerable to the impacts of climate change. Due to its geographical location: surrounded by two oceans, seas and gulfs, setting Mexico is aim of hurricanes, cyclones, storms and floods. In addition to, Mexico is considered as a developing country with restricted financial, technological and institutional resources that

¹⁶ <http://cancun.unfccc.int/adaptation/>

often limits its own capacity to adapt. On the other hand, the actions taken at a NL represent a difficulty on the delegation to the SL. The case study about the wetlands in Tampico, Tamaulipas gives an example of the problem over the institutional operation of the adaptation in Mexico.

Tampico is extremely vulnerable to climate-related events, and although there is a complex system of dykes that have been controlling the water level in the lagoons, the local institutions have not taken into account the service provided by the wetlands, specially using this ecosystem as an adaptation tool. This research has identified that current projects on wetlands and climate change adaptation in the area are not valued by LI in Tampico. It also should be emphasized that the Tampico's LI staff, focuses primarily on the management of the dykes, while the management of wetlands is a subject little discussed.

Adaptation measures often are carried out by people and their institutions, ecosystems, work by themselves, as measures or tools to significantly reduce the effects of climate change. The wetlands, act as a natural adaptation tool, decreasing impacts, but in Tampico this ecosystem has been already deforested, polluted and damaged, in order to build a dykes to manage water levels.

The authors of the article "*The human dimensions of climate adaptation: the Importance of Local and Institutional Issues*" underline: development experience have revealed about ways to effectively invest in the capacities of individuals and the organizations that poor people rely on. Such investment involves promoting structures of inclusive governance, locally and nationally, to ensure that the poor can gain access to services and social protection mechanisms and engage in effective natural resource management in order to deal with the hazards they face" (Christoplos, *et al.*, 2009: 3).

Coordinating efforts avoids, in many cases, double-work and analyses best options, because the consensus between institutions should deliver an accurate assessment, as well as to keep away from maladaptation. In addition, coordination between institutions creates stability in all the institutions and synergy between the actors and their strategies including the private sector, which is based on an imperfect market and subject to constant crisis. In this regard, Adger notes: "the effectiveness of strategies for adapting to climate change depend on the social acceptability of options for adaptation, the institutional constraints on adaptation, and the place of adaptation in the wider landscape of economic development and social evolution" (Adger, 2003: 388).

This paper concludes that current LI in Tampico have not met adequately; the essential requirements that societies and ecosystems need for live, guaranteeing the same for future generations. Meanwhile, Mexico still requires further efforts to implement national instruments at the SL and LL (top-bottom and bottom-up), highlighting that adaptation must be designed according to local needs. Then the coordination across institutional frameworks should be reinforced and restructured, ensuring success in adaptation projects.

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7. Acronyms

CAF	Cancun Adaptation Framework
COP	Conference of the Parties
IL	International Level
IMCCC	Inter-Ministerial Commission on Climate Change
IPCC	Intergovernmental Panel on Climate Change
IRCC	International Regime on Climate Change
LI	Local Institutions
LL	Local Level
NI	National Institutions
NL	National Level
NDP 2007-2012	National Development Plan 2007-2012
SL	State Level
UNAM	National Autonomous University of Mexico (in Spanish)
UNFCCC	United Nations Framework Convention on Climate Change