

THE INFLUENCE OF FRAMING ON THE GOVERNANCE OF CLIMATE CHANGE ADAPTATION AND RISK MANAGEMENT AT THE LOCAL LEVEL: THE CASES OF UPALA IN COSTA RICA AND SAN FRANCISCO DEL VALLE DE OCOTEPEQUE, HONDURAS

*LA INFLUENCIA DE LOS MARCOS DE REFERENCIA
(FRAMINGS) EN LA GOBERNANZA DE LA
ADAPTACIÓN AL CAMBIO CLIMÁTICO Y GESTIÓN
DEL RIESGO A NIVEL LOCAL: LOS CASOS DE UPALA
DE COSTA RICA Y SAN FRANCISCO DEL VALLE DE
OCOTEPEQUE HONDURAS*

Luis Diego Segura Ramírez¹

ORCID: 0000-0002-5278-7699

Adriana Bonilla Vargas²

ORCID: 0009-0008-2955-0643



ABSTRACT

Climate change is one of the main global challenges of the 21st century. The international agenda has come a long way since the approval of the United Nations Framework Convention on Climate Change. The international community has understood that the mitigation agenda will not be enough to address the problems associated with climate change and the latest international instruments have incorporated adaptation as a central issue in the response to it. States have been approving Nationally Determined Contributions within the framework of the Paris Agreement. In these contributions, the generation of public policy to promote adaptation at the national level has been established as a central element. However, a fundamental challenge of adaptation is that it must be studied and developed locally; therefore, national, and international instruments can stimulate and promote these processes. Nevertheless, it will be the local authorities and actors who will determine the progress of these processes.

1 Escuela de Relaciones Internacionales, Universidad Nacional. Profesor. PhD. Candidate. Correo electrónico: luis.segura.ramirez@una.cr

2 Investigadora Independiente. Egresada de la maestría manejo de los recursos naturales y gestión ambiental de la UNED. Correo electrónico: adrimbv@gmail.com

Luis Diego Segura Ramírez y
Adriana Bonilla Vargas



This article focuses on analyzing the influence of actors and their frames of reference in local planning processes and the integration of adaptation to climate change. We studied the cases of Upala, Alajuela in Costa Rica, and San Francisco del Valle de Ocotepeque in Honduras, to understand how these frameworks influenced the development of local public policies that integrated risk management and climate change adaptation measures.

The results show that the referential frameworks of the actors influence how risk and climate change are understood and the assessment of the measures that were included in the local plan. Thus, using comparative case studies applied to countries is a key tool for analyzing international phenomena. Although adaptation is a locally led process, its study, practice, and instruments that facilitate its progress demand research processes that allow the different practices and associated problems to be compared internationally. From the international relations agenda, the study of these adaptation practices of different countries is a key tool in the study of the international agendas for adaptation and response to climate change.

Keywords: Climate Change Adaptation; Honduras; Costa Rica; framing theory; risk management; territorial planning.



RESUMEN

El cambio climático es uno de los principales retos globales del siglo XXI. La agenda internacional ha avanzado mucho desde la aprobación de la Convención Marco de las Naciones Unidas sobre el Cambio Climático. La comunidad internacional ha entendido que la agenda de mitigación no será suficiente para atender la problemática asociada al cambio climático y los últimos instrumentos internacionales han incorporado la adaptación como un tema central en la respuesta a este. Los Estados han aprobado Contribuciones Nacionalmente Determinadas en el marco del Acuerdo de París. En estas contribuciones se han establecido como elementos centrales la generación de política pública para favorecer la adaptación a nivel nacional. Sin embargo, un reto fundamental de la adaptación es que esta debe ser localmente estudiada y desarrollada, por ende, los instrumentos nacionales e internacionales pueden estimular e impulsar dichos procesos, no obstante, serán las autoridades y actores locales los que determinarán el avance de estos.

Este artículo se centra en analizar la influencia de los actores y sus marcos de referencia en procesos de planificación local y la integración de la adaptación al cambio climático, estudiando los casos de Upala de Alajuela en Costa Rica y San Francisco del Valle en Honduras, con el objetivo de comprender cómo estos marcos influyeron en el desarrollo de políticas públicas locales que integraron medidas de gestión del riesgo y adaptación al cambio climático.

Los resultados demuestran que los marcos referenciales de los actores influyen en la forma en que se entiende el riesgo y el cambio climático y en la valoración de las medidas que se incluyeron en el plan local. En Upala los actores más críticos demostraron tener una influencia primaria “individualista” que incidió en una baja percepción del riesgo y una mayor aceptabilidad del “status quo”. Ello contrastó con la perspectiva “jerarquista” del gobierno local, esto derivó en un bloqueo al proceso. En el caso de San Francisco del Valle la combinación de un proceso altamente participativo, sin características normativas de regulación, y con un balance casi perfecto entre las perspectivas “jerarquista” y la “igualitaria” entre todos los actores favorecieron un proceso sin gran conflictividad que derivó en la adopción del Plan de Desarrollo Municipal. La inclusión del cambio climático surgió de las personas participantes del proceso como un tema de gran relevancia ambiental y económico para el cantón.

Palabras clave: Adaptación al Cambio Climático; Costa Rica; gestión del riesgo; Honduras; teoría de marcos de referencia; ordenamiento territorial.

Introduction

“Climate change is currently affecting all countries on all continents” (United Nations, 2019). From melting permafrost and heavy precipitation to droughts, floods and wildfires, these are just a few of the plethora of consequences that have already begun to be experienced around the world and will continue to worsen in the impending future (Pietrapertosa *et al.*, 2018). Since it is no longer about avoiding climate change (CC) at this point, the Intergovernmental Panel on Climate Change (IPCC) emphasizes the urgency of adaptation, recognizing that precautionary and anticipatory measures are more efficient and cost-effective than last-minute emergency solutions (Maslin, 2014).

Taking this into account, Climate Change Adaptation (CCA) policies that aim to guide response to the risks and impacts caused by CC (McNeeley & Lazrus, 2014) have become particularly popular (Pietrapertosa *et al.*, 2018). Notwithstanding, only recently has adaptation gained momentum and become important in national public policies (Pietrapertosa *et al.*, 2018). This trend has also reached Central American countries with a growing number of approved policies (Segura, Van Zeijl-Rozema, & Martens, 2022).

When conducting CCA and risk management processes, decision-makers must answer questions such as whether to adapt, what to adapt to, when, how, who should adapt, and who should pay for the costs of adaptation. These and other questions that appear in the process are laden with normativity, where the participating actors in these processes interact to guide the answer to these questions according to their own frames of reference.

Schön and Rein (1994, p. 23) define frames of reference as “structures of belief, perception, and appreciation”; McEvoy *et al.*, (2013, p. 281) conceptualize them as a process where “people with different knowledge, experiences, and personal backgrounds consider a common challenge and try to *understand* it from their individual or organizational viewpoint.” “Framing” or constructing a frame of reference is connected with how an actor comprehends a situation, process, or even a problem. *Understanding* is directly related to prior knowledge, values, and the perspective of the actor himself. Two actors are perfectly capable of understanding the same situation very differently, even with the same information available, because of different backgrounds, values, or perspectives.

When actors face a situation in which they approach it with completely different and even opposing frames, intractable controversies arise (Schön & Rein, 1994); these are conceived by Hisschemoller and Hoppe (1995) as unstructured

problems, or moderately structured problems, based on the (un)certainty of relevant knowledge and the agreement (or lack of it) on norms and values. Actors who frame the problem with opposing viewpoints generally disagree on the relevant knowledge or the norms and values associated with it, often turning the policymaking process into an unstructured problem.

In this sense, adaptation processes have been shown to encounter a growing number of barriers, many of which are especially focused on the social and institutional dimensions of adaptation. These barriers have been defined as the arrangement of climatic and non-climatic factors that emerge from the actors, the governance system, or the system under study. Thus, studying frames of reference could give us clues into how they affect the relationship between actors and the governance system that facilitates or hampers the implementation of CCA measures and strategies.

This article intends to study the frames that actors bring to the decision-making processes, where the inclusion of risk management and adaptation to climate change measures are assessed. That is to say, the present article analyzes the management of a variety of actors and their frames as well as their influence on the adoption of said measures.

To achieve this objective, the article consists of two case studies. First and foremost is the adoption process of a land-use plan in Upala, Alajuela, Costa Rica, and the second one is the adoption process of the Municipal Development Plan of San Francisco del Valle de Ocotepeque, Honduras. In both cases, local actors deliberated and valued aspects of risk management and adaptation to climate change. In the first case, various social groups pressured local authorities to reject the implementation of the plan, whereas in the second case, the interest of social actors aided in the incorporation of risk management and adaptation elements - which in turn - caused the approval and implementation of the plan.

In this way, both processes show how frames devised by the actors determined the process of constructing public policy with different results. The adaptation processes are determined and constructed locally. Even if States and the international community influence said adaptation processes via national policies, international agreements, or through international cooperation (as it was reported in both cases), it is still the local actors and their local governance processes that will most influence their success or failure (Nalau, J. *et al.*, 2015).

Adaptation case studies allow an understanding of how these processes are developed, and by making use of theoretical instruments, it is possible to understand trends and patterns which can be used to guide future adaptation processes more effectively by integrating them inside international cooperation processes, which is a hallmark element of the study of international relationships.

Methodology

According to [Schön and Rein \(1994\)](#), there are three different levels of action frames. First is the macro level, which comprises the metacultural frames based on a system of values or beliefs ([McEvoy et al., 2013](#)). This framing level refers to values and beliefs often seen through media. These influence research, policies, and decision-making ([Fünfgeld & McEvoy, 2011](#)).

The second framing level is political or conceptual, where actors “construct the problem”, that is to say, they define the problem, concepts, and theories on how to approach and solve said problem ([McEvoy et al., 2013](#); [Schön & Rein, 1994](#)). This level is related to different communities or institutional networks that share values, concepts, and methods, among other elements that allow them to evaluate a topic, define the problem, and construct a solution. Public domains like climate change adaptation and public planning are vast enough that different communities or institutional networks compete to lead the process with their own concepts, theories, and methods.

The third level is defined as institutional or operational framing, [Schön and Rein \(1994\)](#) describe it as “naturally complex and hybrid” because of the lack of a general framework, practically different related frames interact at this level, they are the “local expression of metacultural frames”. For [McEvoy et al. \(2013\)](#), this is the practical level where “decisions and actions are taken”. This framing level is directly related to the design of the planning process, the strategies, and tools chosen to implement it, the products and results of the process, as well as the definitions of the actions to be taken subsequently. Table 1 summarizes the theoretical framework followed by its application to the case studies.

Table 1: Summary of the theoretical framework applied

Levels of framing	Determinants of level	Research orientation
MACRO	System of values and beliefs	Cultural Theory was used to arrange key actors based on four classifications: egalitarian, individualistic, hierarchical, and fatalist (Thompson, 1990; Verweij <i>et al.</i> , 2006).
CONCEPTUAL	Conceptual theorizing applied to ACC	National and local policies were systematized into three conceptual orientations of CCA: resilience, vulnerability, and risk (Eakin <i>et al.</i> , 2009; McEvoy <i>et al.</i> , 2013).
OPERATIONAL	Decision-making and operationalization of the process	Cultural Theory and conceptual orientations were both studied in the construction and discussion process of the local plans. Source: Adapted from McEvoy <i>et al.</i> (2013).

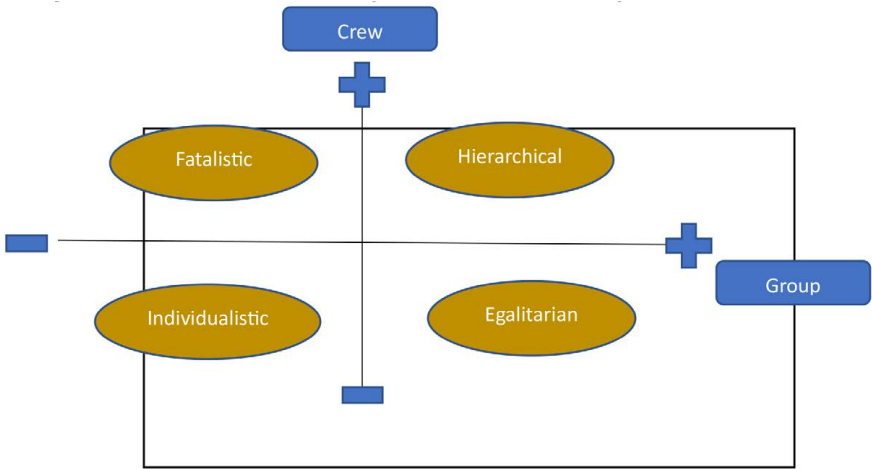
To apply a frame analysis to the case studies, it was determined that the macro level would be analyzed through *culture theory* (CT), which sees culture as essential for explaining social life (Mamadouh, 1999) while it is also perceived as an effective tool for classifying, analyzing, and interpreting people's behavior based on their ways of life (Offermans, 2012). Culture can be defined as “the range of learned ideas and behavior patterns that people acquire, share, and modify as members of a society” (McNeeley & Lazrus, 2014, p. 506).

CT presents two different dimensions of social life called group and grid. Group and grid analysis is relevant to understanding how different types of cultures perceive CC at the meta-level of framing. Group dimension analyzes “the extent to which a primary commitment to a social unit restricts individuals' thought and action” (Douglas, Thompson, and Verweij, 2003, p. 100). See Figure 1.

Conversely, the grid is related to the “level of restrictive prescriptions; life is less open to individual negotiation the more restrictive the prescriptions are”

(Offermans, 2012, p.37). In other words, the group analyzes how many people are integrated into a wider social environment while the grid studies how many people are classified and regulated (Verweij *et al.*, 2011). After understanding if these dimensions are registered as high or low, it is possible to draw four perspectives to understand society and its cultural diversity representation (Mamadouh, 1999). Precisely, one of the statements of CT is that the four possible combinations of the two dimensions are both universal and representative of the nature of a social being (Mamadouh, 1999).

Figure 1: The Grid-Group Analysis of Cultural Theory



Source: Adapted from Thompson (1990)

Figure 1 is comprised of four quadrants, each representing four ways of living discerned according to the strength of the group and the grid: hierarchy, egalitarianism, individualism, and fatalism (Offermans, 2012). Each way of living has a specific topic approach such as natural resources and human nature, including even for Climate Change and Climate Change Adaptation. Group and grid analysis employment along with nature and weather myths are key for exploring how different types of cultures understand climate change on the meta-level of the frame. Figure 2 summarizes the aforementioned information.

Chart 2: Representation of the four perspectives -or ways of life- of Cultural Theory and their view on nature and CC.

Fatalistic: It encompasses the most isolated, vulnerable, and displeased members of society and institutions. They see nature as capricious while also being distrustful of others. This perspective can't be prepared or learned while only reacting to external effects. Religious perspectives that detect negative events as the will of God belong to the Fatalistic way of life. This group is seen as inactive, vulnerable, and generally absent in decision-making. They don't procure solutions regarding CC.

Individualistic: To some degree, members of this group are skeptical about CC and its longer-term consequences. They believe in the human capacity as a limitless source to find technological solutions to issues. They tend to see nature as benign, and they have an attitude that invites and accepts risk. Climate change is seen as a technical affair; for that reason, they prefer solutions derived from the market. Other factors related to the market such as resource prices and invocation are believed to create good conditions to solve CC.

Hierarchical: They have faith in believing CC will be solved by leaving it in the hands of experts belonging to special institutions. They consider CC to be a problem, but not an urgent problem. They see nature as tolerant within certain limits. Control and regulation are considered important tools, meaning they require adroit knowledge to determine the limits to apply. Solutions based on regulations and technology are often preferred by members of this group.

Egalitarian: They recognize CC as an urgent matter created for the most part by an overconsumption society such as the one seen in industrialized countries, which are known for exploiting natural resources. Because of the urgency and dangers of Climate Change, they believe the only solution is by making changes in society by greatly curbing CO2 emissions and by making important changes in human behavior. They perceive nature as fragile while also rejecting the idea that CC can be corrected through technology or the driving force of the market.

Source: Adapted from Figge, L. (2017); Jones (2011); Pendergraft, C. (1998); O'Riordan and Jordan (1999); Thompson (2003); Xue, et al (2016); van Asselt, M. (2000).

The works of Eakin et al (2009); Fünfgeld and Mc Evoy (2001); McEvoy *et al.* (2013) were instrumental in the effort of approaching the conceptual level. Their work allowed the classification and portrayal of the main conceptual frames of reference which are made to drive the development of policies and adaptation procedures. Chart 2 summarizes and compares all three conceptual frames of reference. The first, and most dominant, is the adaptation based on risk management; the second is the adaptation established on vulnerability

linked to the school of studies for development; and the third conceptual frame is the adaptation based on resilience.

Chart 3: Implicit exchanges in the development of climate policies using risk management, resilience, and vulnerability approaches.

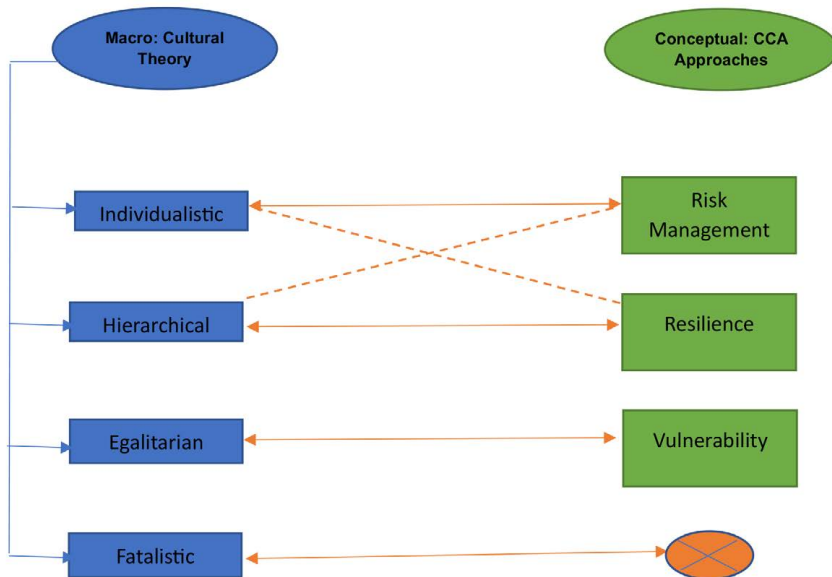
Criteria of the process	Theoretical-conceptual approach to CCA		
	Risk-based adaptation approach	Vulnerability-based adaptation approach	Resilience-based adaptation approach
Special scale of implementation	Sector-focused (e.g. water, agriculture, etc.)	Places, communities, groups, ecosystems, etc.	Large-scale coupled socio-ecological systems (e.g. populated watersheds).
Timeframe of implementation	Short or medium-term future risks.	Past and present vulnerabilities.	Long-term future.
Actors	Public-private partnerships	Public sector and vulnerable groups	Civil society and the public sector.
Policy objective	Address known and evolving risks.	Protect populations most exposed to experiencing harm.	Improve system capacity for recovery and renewal.
Expected outcome	Maximize loss reduction at the lowest possible cost.	Minimize social inequity and maximize the capacities of disadvantaged groups.	Minimize the probability of rapid, unwanted, and irreversible changes.

Source: Own elaboration based on [Eakin *et al.* \(2009\)](#)

In practice, the combination of CT with conceptual framing allows the establishment of relationships between them by uniting different macro-level perspectives with conceptual levels based on their main elements. In this way, the following relationships emerge: a) individualistic, it has strong ties with the adaptation approach relying on risk management, preferring tools and solutions connected with incentives or risk reduction strategies as well as the possibility to transfer adaptation; b) hierarchy, is strongly linked to resilience adaptation methods by focusing on regulation and control processes; c) egalitarian,

connected with an emphasis grounded on vulnerability, as such, it will promote transformation that specifically serves vulnerable groups and nature; d) fatalistic, it doesn't associate with any approach in particular since it does not believe that is worth acting; e) Individualistic, it couples lightly with adaptation based on resilience, giving great emphasis to public-private alliances, self-regulation, and incentives for innovation; f) hierarchical, lightly tied with adaptation established on risk while emphasizing zoning instruments, construction codes among other regulations, and actions regarding risk reduction. Figure 2 depicts these relationships.

Figure 2: Relationships between TC perspectives and ACC approaches.



Source: Own elaboration

An analytical framework was created by making use of the previous elements. This framework explores the influence of the three levels of analysis present in the frames (meta, conceptual, and operational) in public policy and CCA inclusion. Qualitative data was gathered by studying national policies regarding CCA, risk management, and land-use planning of Costa Rica and Honduras, including that of the municipalities of Upala and San Francisco. The selection

of these cases followed several criteria. First, it was decided to select a case with a successful approach (San Francisco) and one with a failed approach (Upala). This would allow comparing the results with the help of the previously formulated conceptual theoretical instrument. Plus, both Upala and San Francisco are rural municipalities near the border with a proportionally-similar territory size in terms of population and levels of economic growth. Moreover, both planning processes were supported by international cooperation institutions, including Japan's International Cooperation Agency (JICA) in the case of Honduras. Costa Rica received aid from the Spanish Agency for International Development Cooperation (AECID).

Interviews with relevant actors were performed throughout the research project. To be more precise, 11 actors were interviewed for each municipality, including local authorities such as mayors, municipal committee members, district advisors, community representatives, municipal technicians, national-level authorities, and local leaders. Interviews followed a semi-structured process by following a shared guide among all conducted interviews, in which questions about the planning process, the chosen approach, participative processes, and results and limitations of the process were integrated. Moreover, direct questions regarding the actors' CC perception were added to provide a clear identification of the CT perspective on the topic. A survey to discern the relationship between distinct frames and environmental topics was included, which has been developed and applied in multiple environment study cases ([Meader, 2002](#)).

In regards to the interview analysis, all interview transcriptions were firstly encoded based on the 4 aforementioned CT perspectives by making use of the last section as a descriptor. Each researcher recognized in the transcriptions the references that are linked with a particular perspective (to exemplify, the egalitarian perspective). These references were then copied and incorporated into a chart that also had the associated perspective and a researcher's comment explaining why that perspective was assigned. To accomplish validation of this method, a randomly chosen transcription was processed by a different researcher, but making sure the researcher followed the same analysis method. The results of the analyses were then contrasted in hopes of identifying result differences that could hamper the study.

The interviews with each actor could show references related to several perspectives. Thus, it was imperative to discern if the interviewee had a preference for a specific perspective (to illustrate, the interviewee's answers could be more related to the hierarchical perspective than to the other perspectives). Based on the work of Beumer et al (2018), the percentage that each perspective received in all transcriptions was calculated, then, it was considered that each

world vision could have 25% of the reference total, attaining a perfect balance. For this reason, in the present study, a perspective will be considered dominant when it obtains a score over 37,5% and secondary if the score is lower than 12,5% ($12,5 \pm [25*0,5]$).

Secondly, the present work was based on [Meader's work \(2002\)](#) who applied questionnaires in his research on environmental worldviews using CT. Every interviewee answered the survey consisting of four items for each perspective (16 in total). The interviewees had to mark each item on a five-point Likert scale with the following categories: completely disagree, disagree, neither agree nor disagree, agree, and completely agree. The percentage of each cosmovision was determined and then the same grading values previously described were applied in hopes to identify which perspective was dominant and which perspectives were secondary. Then, to test the trustworthiness of the CT analysis made on each interviewee, the results of both research instruments were compared.

Results for each case

a) Upala's Case, Costa Rica

Upala is the thirteenth municipality of the province of Alajuela, Costa Rica. It borders Nicaragua. It has an extension of 1580 square meters and an estimated population of 43.653 people ([Municipalidad de Upala, 2012a](#)). This municipality has a strong agricultural calling. In 2019 Upala presented a Municipal Human Development Index of 0.635, reaching, in fact, one of the lowest indexes in the country. Regarding climate risk, 11% of its territory is at flood risk, including 1,2% of its land being prone to lahars. Authorities also discovered drought damage in the area (similar to the drought damage caused in 1998) ([Municipalidad de Upala, 2012b](#)). This municipality presents high vulnerability due to its low social development. Its high agricultural calling makes its economy susceptible to extreme external hydrometeorological events, including its high exposure to floods. Plus, Hurricane Otto affected directly Upala in 2016, highlighting the risk exposure of the municipality.

Upala's case is related to the construction and approval process of the Upala Regulatory Plan (land-use planning) between 2010 and 2014. This process, headed by the Municipality of Upala, counted on the financial support of the Spanish Agency for International Development Cooperation (AECID), in tandem with the Geography Department of the Universidad Nacional de Costa Rica as the technical institution responsible for the studies of the area.

The construction process of this plan needed the recognition of a series of risk management-related factors, to be more precise, the locally coined term “Índices de Fragilidad Ambiental (IFAS), translated to Environmental Vulnerability Index (EVI) for the purpose of this study. Not only were risk management factors grounded on the EVI needed but also CC information was required to continue the plan.

Aiming to study the context of applicable public laws and policies, it is necessary to present the following laws and policies approved during this period:

- Ley Nacional de Emergencias y Prevención de Riesgo (*National Emergency and Risk Prevention Law*) No.8488 dating 22/11/2005.
- Estrategia Nacional de Cambio Climático (*Climate Change National Strategy*) approved in 2007.
- Manual de Instrumentos Técnicos para el Proceso de Evaluación del Impacto Ambiental (Manual de EIA) (*Technical Instrument Guidelines for the Assessment of Environmental Impact*) - Part III Executive Order 32967 20/02/2006.

a.1 Documents related to Upala's Land/use Plan proposal

The National Emergency and Risk Prevention Law didn't include adaptation to CC in its objectives or the actions mandated. Notwithstanding, it does include, as a competency of the National Emergency Commission to assist municipalities with information regarding risk management conditions for land-use planning procedures (articles 14 point h).

Regarding the Climate Change Strategy, which was established in 2007, even though it had actions related to CCA, it was more focused on curbing CC to achieve the goal of becoming carbon neutral in 2021. Despite conveying more interest in carbon neutrality, the information in this document does show concern about the growing necessity to adapt several sectors as a priority, without counting land-use planning. In other words, there was no mandate to integrate CC into the laws and regulations for land-use planning.

The only document that does entail the duty to tackle CC in tandem with land-use planning was the [Technical Instrument Guidelines for the Assessment of Environmental Impact](#). In annex 1 point 5.9.4 section d, it is declared that:

d) Life zones including the most recent climatic and bioclimatic data available for the study area. To the extent that data is available, the climate change factor will be taken into account as part of the evaluation, and in particular, the vulnerability of water bodies and the life they support to said condition linked to the situation of the planetary atmosphere.

In consideration of the characteristics of these variables, they will not be integrated with IFA qualification. They will be included as part of the map and the table of limitations and technical potentialities as information for decision-making (p. 16).

Point 5.13.2 of this same document refers to soil use and overuse as well as environmental carrying capacity. Section a), authorizes that a CC variable must be included when approaching topics related to water as explained below: “a) Source of water, with particular emphasis on the water for human consumption (considering climatic factors -including vulnerability to climate change-, both for surface and groundwater) (P.19).

It is essential to understand that although CC variables are now part of environmental studies, said normative limits their inclusion provided that there is existing information or studies in the area where land-use planning will take place. Interviews with the technical team that conducted the research reveal that they didn't count with local or regional CC scenarios available to inform the process. Even so, they added risk analysis tools that ordained that normative at that moment, which took into consideration the hydrological variable (point 5.5), slope stability analysis (point 5.6), natural threat factor (point 5.7), and the inclusion of more factors (point 5.8) until finally adding anthropological, biological, and edaphological elements.

Continuing with the documents related to the Upala Land-use Plan, the following texts were checked:

- Regulation on Sustainable Development
- Environmental scope
- Zoning regulation

None of these texts incorporated any aspect connected with CC as it was already stated by several interviewees. On the other hand, concrete actions in risk management were integrated. It is also necessary to highlight how much this sector has greatly influenced the creation of conceptual frames and adaptation

tools as well as actions for risk management that bring forth co-benefits related to the subject matter of adaptability. Risk management actions added to the documents are detailed in the chart below.

Chart 4: Inclusion of risk management elements found inside the texts of Upala’s Land/use Plan proposal.

Plan Document	Incorporated Risk Management Elements
Regulation on Sustainable Development, Article 19	It conveys general directives which the municipality ought to follow to address risk management effectively. These directives include discerning, limiting, restricting, and prohibiting infrastructure construction in risk zones prone to suffer from floods, landslides, and other pertinent dangers. It also restricts anthropogenic activities related to lahars while also implementing risk management plans in communities likely to suffer from weather inclemency and environmental risks. It establishes an infrastructure maintenance plan focused on mitigation when facing natural disasters.
Regulation on Sustainable development, article 29	It includes a risk prevention strategy to encourage urban growth in Upala. (p. 74-75)
Regulation on Sustainable development, article 47	It has remedial environmental directives according to the level of environmental frailty of the territory, especially focused on flood probability in the most important rivers, as well as volcanic threat, and landslide and avalanches. (p. 97-98)
Environmental scope document	It entails the results of the diagnostic previously applied. More specifically, the latest results in terms of impacted environmental factors about threat vulnerability including both natural and anthropogenic threats. In this section, it is recognized that 11.7% of Upala’s territory is under flood risk while also having 1.2% of its land susceptible to lahars. (p. 25-28)
Environmental scope document	Section 1.4.5 about natural disasters and risk management lists the concrete zones with the risk of suffering floods and lahars. (p. 43)
Zoning regulation article 10	Corrective ordinances are created according to the results of the diagnostic in terms of territory frailty. Flood, avalanche, and landslide guidelines stand out more than the rest. (p. 15-17)

Plan Document	Incorporated Risk Management Elements
Zoning regulation chapter XXVI	Locates areas susceptible to lahars. It also limits the zones with this type of risk while giving plans of action and labeling territory based on conforming and non-conforming soil use.
Zoning regulation chapter XXVII	Pinpoint's locations with a high flood chance. Moreover, it determines the extension of the risk area as well as conforming and non-conforming soil use and the respective mitigation procedures.

Fuente: Own elaboration based on the documents of the Upala Land-use Plan (Municipalidad de Upala, 2012b, 2012c y 2012d)

As can be seen in the previous chart, the studies duly determined the latent risks in the municipality. Risk zones were determined, and management guidelines were listed with the help of identifying common natural disasters in the area. Authorities developed their local normative draft containing valuable information regarding containing and curbing future risks. Notwithstanding, the possibility of new risks and future risk levels heightened by CC was not considered in said draft.

a.2 Analysis of the results of the actors interviewed by type of actor, profile according to the interview and the survey

Based on the results of the interviews and the questionnaires, the actors showed different perspectives on the issue. This information is detailed in the chart below:

Chart 5: Interview and survey analyses results to determine the actors' dominant and secondary perspectives in the Upala case.

Actor	Interview	Interview Result	Survey Result
Academia	CR-01	Hierarchical 83% (dominant)	Hierarchical 38% (dominant)
		Fatalistic 17% (secondary)	Egalitarian 33% (secondary)
	CR-07	Hierarchical 63% (dominant)	Hierarchical 32% (dominant)
		Egalitarian 21% (secondary)	Egalitarian 32% (secondary)

Actor	Interview	Interview Result	Survey Result
Municipality personnel	CR-02	Fatalistic 47% (dominant)	Hierarchical 35% (dominant)
		Hierarchical 33% (secondary)	Egalitarian 33% (secondary)
	CR-04	Hierarchical 67% (dominant)	Hierarchical 38% (dominant)
		Egalitarian 17% (secondary)	Egalitarian 31% (secondary)
Private sector	CR-03	Individualistic 39% (dominant)	Egalitarian 34% (dominant)
		Egalitarian 35% (secondary)	Hierarchical 29% (secondary)
Political leaders	CR-05	Egalitarian 54% (dominant)	Hierarchical 37% (dominant)
		Hierarchical 38% (secondary)	Egalitarian 29% (secondary)
	CR-06	Hierarchical 85% (dominant)	Hierarchical 32% (balanced)
		Egalitarian 15% (secondary)	Egalitarian 32% (balanced)
	CR-08	Hierarchical 60% (dominant)	Hierarchical 32% (balanced)
		Egalitarian 13% (secondary)	Egalitarian 32% (balanced)
	CR-09	Hierarchical 40% (dominant)	Hierarchical 30% (balanced)
		Individualistic 30% (secondary)	Egalitarian 28% (balanced)
	CR-10	Hierarchical 60% (dominant)	Hierarchical 31% (balanced)
		Egalitarian 20% (secondary)	Egalitarian 31% (balanced)
Social sector	CR-11	Hierarchical 62% (dominant)	Hierarchical 32% (balanced)
		Egalitarian 23% (secondary)	Egalitarian 32% (balanced)

Source: Author.

Based on the previous chart, the following analysis relates the type of actor and worldview documented with interview and survey, this is based on cultural theory. The base question to apply is: *What was the role fulfilled by the different perspectives of key actors during decision-making in the Municipalidad de Upala regarding the process of drafting and delivering on the approval of the land-use plan?*

Regarding the distribution among the perspectives according to their representativity in the results, it can be observed the following: the hierarchical perspective was majoritarian between a total of eight actors in both instruments. This perspective was also majoritarian in a total of two consulted actors, in one of the instruments, which was the survey. The second perspective represented as dominant was egalitarian, a total of two stakeholders, one in the interview and the other in the survey presented this perspective as dominant. Egalitarian and hierarchical were also the most common secondary perspectives between all the actors. The individualist and the fatalist were the least represented perspectives among dominant and secondary in both instruments with each of them as dominant and the same number as secondary. The least represented dominant perspectives were the fatalist and the individualist. Each of them with one case. The initial former was identified in the actor CR 02, a city official; the second one was identified in the actor CR 03, from the private sector.

The percentual differences between perspectives based on the answers provided by the consulted people were stretched by the application of the survey regarding the interview where it was less clear the dominant position as the minority of the criteria was above 37,5% which defines the dominance between perspectives. For that reason, it can be affirmed that there is a more marked distance in the positions of the consulted person when their answers are provided in the context of an interview.

Of the eleven consulted people, eight of them coincide in the dominant perspective in both instruments, evidencing consistently as their dominant influence *the Hierarchical perspective*. Based on this it follows that for this case study, 72% of the consulted people have a perspective influenced by a hierarchical frame of reference.

It can be observed that according to the percentages regarding the answers provided in both cases the actors have a secondary position very similar or identical to their percentual value regarding the dominant perspective. This makes it possible to assume that both perspectives are very close to each other in their understanding and definition of the aspects that concern the substantive issue, namely the elaboration process of the Land-Use Plan of Upala, from the

perspective of the CCA and the risk management from which the design of the survey originated.

Based on the same chart it can be interpreted that the egalitarian perspective is common to seven of the consulted people as a secondary position, in a percentage of 64% in the interview's case. In the survey, the same perspective ascends to ten of the consulted people for a percentage of 91%. That is to say that by combining both instruments (22 instruments applied, two for each person) the egalitarian perspective adds 17 positions and 77,2% as the secondary perspective among the consulted people.

This allows us to propose that this percentage of the total number of people consulted shares, even a variable range, a similar understanding, and definition of the problem presented with respect to the Land-Use Plan, from the approach of risk management and adaptation to climate change.

Three of the analyzed cases deviate from the trend of the main group that presents as dominant the hierarchical perspective. This group stands out in the following aspects:

1. They are the only ones that do not present as dominant in both categories the hierarchical perspective.
2. They are the only ones in which the dominant perspective does not coincide in both instruments.
3. They are the only ones that evidenced a frame that incorporates the fatalist perspective and the individualist perspective with one case each.
4. Additionally, it can be observed how in three cases the hierarchical and egalitarian perspectives are present as secondary perspectives, and in the third of them, there is an exchange of positions. However, it always remains within the combined scope of the hierarchical and dominant perspective which resulted to be predominant in the global results among all the consulted actors.

a.3 Discussion about the results of Upala's case

It is important to review in general terms the temporal context of the case. In 2010, the process of construction of the Land-Use Plan of Upala initiates with the support of Spanish cooperation. The Universidad Nacional is hired as

a technical entity for the elaboration of the studies and technical design. The municipality (mayor's office and Council) has an important role at the beginning and the end of the process, but it had little involvement during the process. In 2014, the process finishes with the indecision of the Council to elevate the plan to INVU, a national/government institution, for its validity because of the strong social pressure produced by a group that opposes the plan, composed mainly of representatives from the private sector from the urban center that with their resources mobilize people from different communities, alleging among other aspects that the studies overestimated the risks and that it would generate a great loss in the economic activity in the municipality.

In 2016, Hurricane Otto had a significant impact in Upala which resulted in the loss of human lives and public and productive infrastructure by floods and landslides. Based on the performed study it can be concluded that for this case:

1. Since its beginning, the process had a significant component of external management. This contributed to the supporting and management of the process, but at the same time, it implied a significant influence of outside actors alien to the local sphere which, in a certain matter, was exploited by the opposition.
2. The latter made it easier to implant the perception that the project of reference for this analysis (land-use plan) was essentially "elaborated in a desk in San Jose".
3. The process seeks to achieve high participation of local actors. Indeed, it had a participative component that can be considered between moderate and high at the local scale. However, it didn't permeate enough to counter the perception of what was indicated in point 2.
4. There were institutional actors with particular interests which acted forming an opposition to the initiative because they considered that such interests would be prejudiced by the adoption of the plan, regardless of its quality.
5. This individualistic group had a low perception of the risk and for that reason affirmed that the technical instruments overestimated such risk, which was refuted by the effects of Hurricane Otto.

6. The fact that the land-use plan, different from other plans, has a binding character in management and decision-making in the municipal territory, favored the formation of such opposition.
7. The instrument was developed and approved by the Municipal Council, but it was not presented to the competent national authorities because of the local conflict that was generated around it.
8. It was evidenced that the underlying political background, in this kind of process, can be more significant than the quality and performance of the process from a technical aspect. From this characteristic, using frame analysis as developed in this article, gives explanations for these kinds of phenomena.
9. In the Costa Rican context, the high centralism from the state-structure is a signal of a high influence of the image and hierarchical position. It can also be taken as an example of the first strategy for climate change that originated directly from the Presidency of the Republic in 2007.
10. It has been sought to increase citizen participation over time. However, it continues to be a challenge for these processes, ranging from operational aspects, such as schedules, to the political and comprehension of the cultural weight of these processes.

b) Case San Francisco del Valle de Ocotepeque, Honduras

The municipality of San Francisco del Valle counts has a population of 7,999 habitants and a 12.124 square meters territory. It is a municipality with a strong agricultural vocation where coffee farming is the main activity. It possesses an important population in poverty with estimations of 58% of the population with a daily income lower than one American dollar and only 52,5% of the kids in scholar age are enrolled in school ([Municipalidad de San Francisco del Valle, 2018](#)). In environmental matters, the Plan for Municipal Development also identified the occurrence of a series of negative aspects related to global warming, including abrupt changes in the average temperature, long periods of draughts, shorter rainy seasons, and forest fires among others. ([Municipalidad de San Francisco del Valle, 2018](#))

The case of the municipality of San Francisco del Valle de Ocotepeque centers on the process of elaboration and approval of its Municipal Development Plan (PDM in Spanish) with a focus on Territorial Planning. In the case of San

Francisco, the process was supported by the project Strengthening Local Capacities Project for the Republic of Honduras (FOCAL II in Spanish) executed by the Secretary of Governance, Justice, and Decentralization (SGJD in Spanish) from the Government of Honduras with the sponsor of the International Cooperation Agency of Japan (JICA). This process was initiated in 2010 and 2011 with the formation of technical teams to later advance with the establishment of a baseline and later continue with the discussion process from the community level, zone areas, and finally to a municipal level. This process resulted in the approval of the PDM of San Francisco 2018-2023 which was certificated by the SGJD.

To study the context of the applicable public policies it was documented for Honduras the following policies approved during the 2010-2017 period:

- I. Land-Use Planning Law, Decree No. 180-2003.
- II. National Risk Management System Law (SINAGER), Decree No. 151-2009.
- III. Climate Change Law, Decree No. 297-2013.
- IV. National Climate Change Strategy of 2010.
- V. State Policy for the Comprehensive Management of Risk in Honduras of 2013.
- VI. Regulations for the formulation of municipal development plans with a territorial planning approach, Agreement No. 00132 of 2013.
- VII. Methodological Guide: Elaboration of Municipal Development Plans (PDM) with a territorial planning approach.
- VIII. Municipal Development Plan with a territorial planning approach for San Francisco del Valle.

b.1 Documents related to San Francisco's Development Plan proposal

Initiating with the Land-Use Planning Law, this law does not integrate climate change among its objectives and norms. However, this legislation does directly address risk management as part of the processes of territorial planning,

integrating it as a critical aspect of the process. For example, articles 31, 44, 47, 88, 89 y 100. The law SINAGER integrates decisively climate change as a critical element that must be part of risk management in Honduras. This legislation even establishes in its principle III, the responsibility of municipalities to implement actions in prevention and risk reduction, preventing and mitigating disasters, adapting to climate change, and answering emergencies, including rehabilitation and reconstruction of affected areas.

One interesting aspect of the Honduran case is the existence of the Climate Change law whose purpose is that state institutions and the general population adopt practices to reduce environmental vulnerability and to improve the capacity of adaptation (article 2). Among the law's objectives, it is established to contribute to interiorizing all the projects and development plans of public and private sectors the environmental variable. This takes into consideration climate change and adaptation (article 6, clause 2). The law demands that Municipalities and Councils of Municipal Development take into consideration the results of the National Climate Change Strategy, the Nacional Action Plan on Adaptation and Mitigation of Climate Change, and the Honduras National Communications on Climate Change, when elaborating their local land-use plans, so this instrument integrates adaptation and mitigation (article 24).

The Honduran legal's framework is clear demanding that the process of planning and land-use planning integrate aspects of risk management and adaptation. In this case, municipalities had been delegated to steer the integration of both topics within their local planning processes. Regarding public policies, the National Strategy of Climate Change makes special emphasis on the need to advance the integration of the assessment of ACC within the local planning instruments, being this PDM, or Land-Use Plans (LUP). These instruments are particularly highlighted as measures of adaptation in the water resources area (p. 82-83) and risk management (p. 94-95).

The risk management policy, integrated elements related to climate change, the main one is the inclusion of this variable in the instruments of risk management. One of the principles of this policy (principle b), calls for addressing LUP as a critical element of risk management to provide human security. Specific objective 2 articulates this principle by procuring to incorporate it into the instructions, guidelines, and methodologies in the management of a territory. Strategic guideline 3 develops the actions that should be implemented in this area, even by proposing the need to integrate variability and climate change in the zonings of hazards.

The regulation for the drafting of PDM includes a cross-cutting axis for municipal planning, on point 2 the risk management of disasters and territorial planning is asking that those processes address the risk letting implicitly the adaptation to climate change. However, the rest of the document does not address how to value the risk and adapt to climate change. Therefore, it remains unclear how to activate the transversal axis. This becomes even more evident in the methodological guide for the development of the PDM which fails to integrate climate change and risk management clearly. As part of the diagnostic of the municipality, it is only asked to apply a SWOT analysis which integrates the variable threats. However, it is not clear about the specific type of threats it refers to, nor does it explicitly require the integration of weather-related threats.

As it can be appreciated in the overall reading, Honduras has done an exceptional effort to develop a public policy updated to integrate mandates for addressing climate change, especially in adaptation and risk management. Both legislation and policies demand to approach these two aspects within the development of plans and projects of all the state, including local governments. However, these strategic mandates have little impact on the operational level instrument where decisions on how to address climate change and risk management are taken.

The main example is the short coming in the approach of the methodologic guideline and the little clarity that the PDM normative provides leaving the local actors to decide whether to address or not climate change and risk management and how to do it.

Regarding the PDM in San Francisco it must be emphasized that even though the methodological guideline did not require to assess climate change during the drafting process, the topic was frequently and systematically addressed as an important threat to the development of the productive sector of the municipality (p. 53, 56, 57, 58, 63, 67, 75). In addition, it was contemplated as an opportunity the fact that different institutions are willing to support the development of projects to address climate change (p. 58 and 79). Although the threat posed by climate change is clearly identified, the plan does not develop specific objectives regarding adaptation. However, it structures a series of activities that directly address the protection of natural resources as actions to confront climate change. These activities are organized by zones (a total of five zones) and involve a series of initiatives that will be implemented by communal organizations, the municipality, and external actors.

For example, in Zone 1, activities are articulated (p. 115) as follows:

1. Environmental care training program.
2. Prohibition of hunting.
3. Certification process for farms.
4. Establishment of forest nurseries.
5. Certification process for forested lands.
6. Organization of a forest firefighting group.

What is interesting about this (PDM) is that in the different zones, it is developed an investment plan that includes activities in all its communities, all these five plans put together constitute the municipal PDM. There are 178 actions divided into different thematic axes like water, education, health, land-use planning, land, housing, and vulnerable populations among others. Now, the plan does not integrate direct actions especially thought to address risk management or CCA. However, the community is aware of the problematic and it approaches directly by protecting its natural resources (especially forests and water) and reducing vulnerability, especially in the coffee production sector. This was evident in several of the interviews.

b.2 Result analysis on the interviews with the actors according to the actor type, interview profile, and the survey application.

In Honduras case there were three group interviews, these were the coded interviews as HON-02 with two technicians from the Municipal Association of Honduras (AMHON in Spanish), HON-05 with four leaders of different organizations from the community of Santa Teresa de San Francisco del Valle, and HON-07 with both local leaders from two different communities from the urban area of San Francisco. According to the performed analysis, the consulted actors manifested their perspectives regarding the problematic according to the next results:

Chart 5: Results of the analysis of interviews and questionnaires to determine the dominant and secondary perspectives of the actors in the case of San Francisco del Valle.

Actor	Interview	Interview results	Survey results
Ministerial Technician	HON-01	Hierarchical 60% (dominant)	Hierarchical 34% (dominant)
		Egalitarian 20% (secondary)	Egalitarian 32% (secondary)
			Fatalistic 9% (marginal)
Experts of AMHON	HON-02*	Hierarchical 66.66% (dominant)	Hierarchical 36% (dominant)
		Egalitarian 26.66% (secondary)	Egalitarian 31% (secondary)
		Individualistic 6.66% (marginal)	Fatalistic 11% (marginal)
Municipal Personal	HON-03	Egalitarian 46.66% (balanced)	Hierarchical 30% (balanced)
		Hierarchical 46.66% (balanced)	Egalitarian 30% (balanced)
		Fatalistic 6.66% (marginal)	
Political leaders	HON-04	Hierarchical 54.54% (dominant)	Hierarchical 35% (dominant)
		Egalitarian 45.45% (secondary)	Egalitarian 29% (secondary)
			Fatalistic 12% (marginal)
Social Sector	HON-05*	Hierarchical 60% (dominant)	Hierarchical 43% (dominant)
		Egalitarian 40% (secondary)	Egalitarian 34% (secondary)
			Fatalistic 11% (marginal)

Actor	Interview	Interview results	Survey results
Municipality personal	HON-06	Egalitarian 55% (dominant)	Hierarchical 35% (dominant)
		Hierarchical 45% (secondary)	Egalitarian 29% (secondary)
Social Sector	HON-07*	Egalitarian 66% (dominant)	Hierarchical 32% (dominant)
		Hierarchical 26% (secondary)	Egalitarian 29% (secondary)
Municipality personal	HON-08	Egalitarian 69% (dominant)	Hierarchical 39% (balanced)
		Hierarchical 23% (secondary)	Egalitarian 39% (balanced)
Municipality technician	HON-09	Egalitarian 42% (balanced)	Hierarchical 35% (balanced)
		Individualistic 42% (balanced)	Egalitarian 35% (balanced)
			Fatalistic 10% (marginal)
Municipal Federation Technician	HON-10	Egalitarian 83% (majority)	Egalitarian 36% (dominant)
		Hierarchical 16% (secondary)	Hierarchical 33% (secondary)
Social Sector	HON-11	Egalitarian 73% (majority)	Egalitarian 43% (dominant)
		Hierarchical 27% (secondary)	Hierarchical 40% (secondary)

*: The profile of one of the participants is analyzed in the interview, not all of them.

Source: Author.

Based on the chart, the next analysis of the interview is presented regarding the kind of actor and profile that emerges from the interview and the survey completed by each of them, according to cultural theory.

Regarding the distribution between perspectives according to their representativity in the results, it was found the next. The hierarchical and Egalitarian perspectives are very balanced with four interviews where each is respectively dominant with unanimous results between the interview and the questionnaire. Even in two cases, both perspectives are completely balanced on the questionnaire and the analysis of the interview. A third interview shows as dominant in the questionnaire the hierarchical perspective, but the analysis of the interview catalogs it as egalitarian.

This reflects an important balance between both perspectives which could explain certain stability in the design process, approval, and execution of the PDM. The least represented perspectives were the fatalist and the individualist. In this case the latter achieved to represent the secondary perspective. Regarding the contrasting results between the dominant perspectives identified for the same actor, only in one case, it was detected a variation between both instruments, which shows a high level of trust in the identification of the dominant perspectives and less measure of the secondary ones.

The fact that the group focused on two perspectives with an almost perfect balance, inclusively being this in many cases interchanged between dominant and secondary proposes that the consulted people share an understanding and similar definitions in the process of construction and approval of the PDM in San Francisco, from the perspective of risk management and climate change adaption.

There are many coincidences between the interviews among a wide acceptance of the participation of different stakeholders in the process, the need to create local normative or public policy, and finally the importance assigned to the problem of climate change and its necessary addressing where the actions of conservation and protection of natural resources and ecosystems are the most signaled.

b.3 Discussion about the results from San Francisco del Valle case.

It is important to clarify that the PDM is by national norm necessary for the municipalities to receive funds from the national government, the budget transfers that allow them to develop projects, activities, and investments. This favors that the local actors far from stopping the process look forward to advancing it as its successful approval depends on the financial resources.

In addition, if it is true that the PDM has a land-use planning focus, it is not a land-use plan per se, as it lacks the normative faculties of zoning and regulation of land use. In concrete, the PDM works as the bank of prioritized projects for each municipal zone which each respective area of influence, relevant actors,

and identification of the necessary resources. With this plan, the municipalities establish their operative plans and annual inversion budgets over which they are held accountable.

Based on the performed analysis, the next could be concluded about this case:

1. The process counted on the important support of third actors and a very clear and solid methodological framework with concrete tools, but these did not address the topics of risk management or CCA deeply. The process from its beginning is highly participatory of the organizations and local leadership in all the communities of the municipality.
2. There was a strong process of appropriation that cause the actors to identify autonomously climate change as a fundamental threat to the development of the municipality and for that reason there were identified actions that could support the preparation to face negative effects, overall in environmental and natural resources, such as water, sanitation, land-use planning, and economy.
3. The presence in the territory of NGOs and international cooperation projects regarding climate change prepared the path for local organizations and leaders to integrate that previous knowledge into the PDM process besides this was not requested by the methodology
4. The absolute convergence of an almost perfect balance between the hierarchical and egalitarian perspectives favored a conjunction of measures that were acceptable for all the actors, leaving little space for resistance to the opposition of third parties. Actually, in almost all the interviews it was clear that there were no identified opponents to the process, but people that did not believe in the importance of it (fatalist perspective), others that were motivated to participate, and those who simply abstain completely.
5. It is clear that the nature of the instrument (PDM) did not generate competence for the instruments that could be affected (as it occurs in land-use planning processes), but the discussion for prioritizing actions that all actors considered important. This together with the participative nature of the process avoided important confrontations that could lead to obstacles for the approval and implementation of the instrument.

Conclusions

It is relevant to delve into how different people frame a problem. This is a tool to better comprehend the development of policies and how different frames of reference influence their design (Dupuis & Knoepfel, 2013). Therefore, frame theory allows a better comprehension of how people define what is CCA and its effect on local agendas (McEvoy *et al.*, 2013).

In this article, it was possible to appreciate how the perspectives of the actors influence the design processes and approval of the public policy where they seek to integrate elements of CCA and risk management. It is important to take into account some of the differentiating particularities in both cases. Even if the instruments in both cases comprehend elements of land-use planning, it is clear that in the case of San Francisco, this was not a typical instrument which it is highly likely to influence a lower possibility to create conflict or opposition among stakeholders.

Being Upala's case a process to draft and approve a land-use plan, this affected the interests of different economic groups. These initially did not pay a lot of attention to the process until they identified that the zoning by the risk of flooding could have a direct impact on the value of properties and economical activities (for example, increased insurance costs, loss of property value, etc.).

In both cases, it can be noted a strong hierarchical tradition in both countries of establishing norms and national policies which influences the local processes of design and approval of the local public policy. An example of that was the development of the strategy of CC in Costa Rica, which is directly managed by the presidency with a strong emphasis on CCM. In Honduras' case, this is reflected in the national normative which obligates the municipalities to have a PDM using the national methodology if they want to opt for receiving the economic transfers from the central government.

A critical aspect is that in both cases the national policies identified the management and drafting of land-use plans as critical for the process of risk management and CCA, in both cases the operative instrument (the normative and technical guidelines) are very ambiguous and therefore it is up to the local actors to decide how to board the CCA or if addressing it at all.

Regarding the analysis of the perspectives of the stakeholders, it can be noticed a strong representation of the hierarchical perspective (this was expected) followed closely by the egalitarian perspective (which is usually a mobilizing actor

and actively participates in the processes). In both cases, the great majority of actors concentrate on both perspectives. However, it is important to note that when the instruments are mainly regulative (as in Upala's case), it is expected the reaction of stakeholders with an individualist perspective, which may feel their interests are being affected.

In this sense, it is possible to discern a thoroughly narrow approach to these processes with an emphasis on hierarchical measures such as rules, taxes, and regulations. This emphasis is prone to cause conflict against other perspectives that do not include more favorable solutions. To illustrate, San Francisco's case sheds light on this situation by giving an array of measures beyond solely relying on hierarchical approaches, which attributed to the success of public policy instruments.

Both processes had a participative design. Although in Upala's case, an external actor – the technical team hired, UNA (Universidad Nacional) – in unison with the municipality of Upala conducted the process design. Whereas in the San Francisco case, the task required local leaders to manage local implementation with ample community participation, assuring a more effective representation of contrasting perspectives in the approval of research instruments, contrary to Upala's case, where the quality of the participative processes was strongly criticized.

In Upala's case, the emphasis of the approach was greatly influenced by the conceptual level of risk management which was clearly linked to the hierarchical perspective. On the other hand, in San Francisco's case, elements linked with the conceptual approach of vulnerability were identified, such as ample references to CC as a threat and its impact on diverse areas of the municipality were included in the PDM. This shows a marked influence of the egalitarian perspective.

By using frame theory, it was possible to discern operative elements of great interest that could aid local adaptation procedures. Firstly, it allows recognition of different perspectives competing and or cooperating as a means to lead the process of creation and approval of public laws and policies. Secondly, starting from a macro level, these perspectives show essential preferences necessary to approach the issue at a conceptual and operational level; in other words, if these processes of public policy drafting are highly focused on stakeholders with the same perspective, their frame will greatly influence which operational and conceptual instruments will be used. To exemplify, Upala's predilection to accept risk management instruments started at a national level and finished at a local level without further questioning. Conversely, by permitting a plethora of

perspectives, a more inclusive design can be created as seen in San Francisco's case, where the process was highly participative allowing to assess vulnerability, risk management, and development aspects.

Third, making visible the different perspectives present in the various actors that participate in these processes, and attending to the differentiated orientations on how to approach them and from which measures to integrate, could lead to the construction of more comprehensive policies that allow further progress and results. San Francisco's case is a quintessential example of how a wide arrange of actions to satisfy a bigger number of participants proved beneficial for the project. These are widely known as "clumsy solutions", answers to problems that require a high level of skill and planning (Beumer, 2014; Verweij *et al.*, 2006).

These three aspects are key to understanding how to guide the creation of adaptation policies. As mentioned in the introduction, our current climate crisis bounds every country in the world to make advancements in the formulation of effective adaptation policies. Aspects such as resources, regulations, and investment priorities demand important decisions at a local level while negative effects of CC cause a rise in damage and losses. Thus, the edification of well-made and feasible plans based on socially acceptable adaptation instruments is critical at a local scale.

The research instruments used in this analysis allowed a clear understanding of the good practices and the constraints these adaptation procedures are having. For international studies, it is critical to understand how governance processes related to adaptation policies are developed in several countries by making use of theoretical and conceptual research instruments that give room to better compare and comprehend them. Frame theory proves to be a useful tool for the cases presented in this research, which could be applied, in the future, to cases with bigger differences between them such as comparing developed and developing countries, simple and complex municipalities, and urban and rural municipalities.

Adaptation, as previously discussed, requires a strong local involvement; however, it is not developed in isolation. It is influenced by an international agenda of regimes ever-growing in complexity and stakeholders that gain influence through technical and financial cooperation (as documented in the cases of Upala and San Francisco). The national governments also shape parameters and conditions to develop local planning, through the creation of policies and legislation. For this reason, seen from the perspective of international studies, it is vital to deepen the study of adaptation processes in several countries, and

doing so through new and diverse methods. Frame theory is valued as an interesting alternative.

However, this theory, like others, brings forth a range of limitations such as not studying the power relations between the stakeholders. This was evident in Upala's case where private sector actors used their economic capacity to mobilize a sector of the population and to pressure decision-makers, paralyzing the approval of the land-use plan as a consequence. Additionally, this research intended to study both the macro and conceptual perspectives in the acting of authorities, leaving aside the power and the capacity of the actors. Other research instruments such as actor analysis viewed from the MACTOR method could be complementary to this study.

References

- Asamblea Legislativa de la República de Costa Rica (2005). Ley Nacional de Emergencias y Prevención del Riesgo N.o 8488 del 22/11/2005.
- Beumer, C. (2014). Stepping stone cities? : exploring urban greening and gardening as a viable contribution to global biodiversity conservation. Universitaire Pers Maastricht, Retrieved from [https://cris.maastrichtuniversity.nl/portal/en/publications/stepping-stone-cities--exploring-urban-greening-and-gardening-as-a-viable-contribution-to-global-biodiversity-conservation\(5ea45ce5-a4ca-4c84-bafd-c6aff9b239e4\).html](https://cris.maastrichtuniversity.nl/portal/en/publications/stepping-stone-cities--exploring-urban-greening-and-gardening-as-a-viable-contribution-to-global-biodiversity-conservation(5ea45ce5-a4ca-4c84-bafd-c6aff9b239e4).html)
- Beumer, C., Figge, L., & Elliott, J. (2018). The sustainability of globalisation: Including the 'social robustness criterion'. *Journal of Cleaner Production*, 179, 704-715. doi:<https://doi.org/10.1016/j.jclepro.2017.11.003>
- Congreso Nacional de la Republica de Honduras (2003). Ley de Ordenamiento Territorial Decreto No. 180-2003. Recuperada de: <http://cidbimena.desastres.hn/RIDH/pdf/doch0063/pdf/doch0063.pdf>
- Congreso Nacional de la República de Honduras (2009). Ley del Sistema Nacional de Gestión de Riesgos (SINAGER) Decreto No. 151-2009. Recuperado de: <https://www.poderjudicial.gob.hn/CEDIJ/Leyes/Documents/Ley%20Sistema%20General%20de%20Riegos%20Sinager.pdf>
- Congreso Nacional de la Republica de Honduras (2013). Ley de Cambio Climático. Decreto No. 297-2013. Recuperada de: <https://www.tsc.gob.hn/biblioteca/index.php/leyes/595-ley-de-cambio-climatico>
- Comisión Permanente de Contingencias de Honduras (2013). Política de Estado para la Gestión Integral del Riesgo en Honduras. Recuperada de https://portalunico.iaip.gob.hn/portal/ver_documento.php?uid=OTYyMzg5MzQ3NjM0ODcxMjQ2MTk4NzIzNDI=

- de Boer, J., Wardekker, J. A., & van der Sluijs, J. P. (2010). Frame-based guide to situated decision-making on climate change. *Global Environmental Change*, 20(3), 502-510. doi:<https://doi.org/10.1016/j.gloenvcha.2010.03.003>
- Douglas, M., Thompson, M., & Verweij, M. (2003). Is time running out? The case of global warming. *Daedalus*, 132(2), 98-107.
- Dupuis, J., & Biesbroek, R. (2013). Comparing apples and oranges: The dependent variable problem in comparing and evaluating climate change adaptation policies. *Global Environmental Change*, 23(6), 1476-1487. doi:[10.1016/j.gloenvcha.2013.07.022](https://doi.org/10.1016/j.gloenvcha.2013.07.022)
- Eakin, H., Tompkins, E. L., Nelson, D. R., & Anderies, J. M. (2009). Hidden costs and disparate uncertainties: trade-offs in approaches to climate policy. In I. Lorenzoni, K. L. O'Brien, & W. N. Adger (Eds.), *Adapting to Climate Change: Thresholds, Values, Governance* (pp. 212-226). Cambridge: Cambridge University Press.
- Figge, L. S. (2017). Connectedness in times of ecological overshoot: a quantitative analysis of the sustainability of globalization. Maastricht University.
- Fünfgeld, H., & McEvoy, D. (2011). Framing climate change adaptation in policy and practice. Victorian Centre for Climate Change Adaptation Research, Melbourne.
- Hisschemoller, M., & Hoppe, R. (1995). Coping with Intractable Controversies: the Case for Problem-Structuring in Policy Design. *Knowledge for Policy*, 4(8), 40 - 60. doi:[urn:nbn:nl:ui:29-12441](https://nbn-resolving.org/urn:nbn:nl:ui:29-12441)
- Jones, M. D. (2011). Leading the Way to Compromise? Cultural Theory and Climate Change Opinion. *PS: Political Science & Politics*, 44(4), 720-725. doi:[10.1017/S104909651100134X](https://doi.org/10.1017/S104909651100134X)
- Jones, R., Patwardhan, A., Cohen, S., Dessai, S., Lammel, A., Lempert, R., . . . von Storch, H. (2014). Foundations for decision making.
- Mamadouh, V. (1999). Grid-group cultural theory: an introduction. *GeoJournal*, 47(3), 395-409. doi:[10.1023/A:1007024008646](https://doi.org/10.1023/A:1007024008646)
- Martz, J. D. (1991). *Cultural Theory*. By Michael Thompson, Richard Ellis, and Aaron Wildavsky. Boulder: Westview, 1990. 296p. *American Political Science Review*, 85(3), 1008-1008.
- Maslin, M. (2014). *Climate change: a very short introduction*: OUP Oxford.
- McEvoy, D., Fünfgeld, H., & Bosomworth, K. (2013). Resilience and Climate Change Adaptation: The Importance of Framing. *Planning Practice & Research*, 28(3), 280-293. doi:[10.1080/02697459.2013.787710](https://doi.org/10.1080/02697459.2013.787710)

- McNeeley, S. M., & Lazrus, H. (2014). The cultural theory of risk for climate change adaptation. *Weather, climate, and society*, 6(4), 506-519.
- Meader, N. (2002). A theoretical and methodological examination of cultural theory applied to environmental issues. (Doctoral dissertation). University of Surrey, Retrieved from <http://epubs.surrey.ac.uk/851/1/fulltext.pdf>
- Ministerio de Ambiente y Energía de la República de Costa Rica (2007). Estrategia Nacional de Cambio Climático. Recuperada de: <https://cambioclimatico.go.cr/wp-content/uploads/2018/08/ENCC.pdf>
- Ministerio de Ambiente y Energía de la República de Costa Rica (2006). Manual de Instrumentos Técnicos para el Proceso de Evaluación del Impacto Ambiental (Manual de EIA)-Parte III Decreto Ejecutivo 32967, del 20/02/2006. Recuperado de: http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1=NRTC&nValor1=1&nValor2=57062&nValor3=72443&strTipM=TC
- Municipalidad de Upala. (2012a). Plan Cantonal de Desarrollo Humano Local, Upala 2013-2023. Documento facilitado por la municipalidad.
- Municipalidad de Upala. (2012b). Plan Regulador del Cantón de Upala: Alcance Ambiental. Documento facilitado por la municipalidad.
- Municipalidad de Upala. (2012c). Plan Regulador del Cantón de Upala: Reglamento de Desarrollo Sostenible. Documento facilitado por la municipalidad.
- Municipalidad de Upala. (2012d). Plan Regulador del Cantón de Upala: Reglamento de Zonificación. Documento facilitado por la municipalidad.
- Municipalidad de San Francisco del Valle (2018). Plan de Desarrollo Municipal de San Francisco del Valle de Ocotepeque. Documento facilitado por la municipalidad.
- Nalau, J., Preston, B. L., & Maloney, M. C. (2015). Is adaptation a local responsibility? *Environmental Science & Policy*, 48, 89-98.
- O'Riordan, T., & Jordan, A. (1999). Institutions, climate change and cultural theory: towards a common analytical framework. *Global Environmental Change*, 9(2), 81-93. doi:[https://doi.org/10.1016/S0959-3780\(98\)00030-2](https://doi.org/10.1016/S0959-3780(98)00030-2)
- Offermans, A. (2012). The perspectives method: towards socially robust river management: Maastricht University.
- Pachauri, R. K., Gomez-Echeverri, L., & Riahi, K. (2014). Synthesis report: summary for policy makers.
- Pendergraft, C. A. (1998). Human Dimensions of Climate Change: Cultural Theory and Collective Action. *Climatic Change*, 39(4), 643-666. doi:[10.1023/a:1005323809980](https://doi.org/10.1023/a:1005323809980)

- Pietrapertosa, F., Khokhlov, V., Salvia, M., & Cosmi, C. (2018). Climate change adaptation policies and plans: A survey in 11 South East European countries. *Renewable and Sustainable Energy Reviews*, 81, 3041-3050. doi:[10.1016/j.rser.2017.06.116](https://doi.org/10.1016/j.rser.2017.06.116)
- Schön, D., & Rein, M. (1994). *Frame reflection: toward the resolution of intractable controversies*. New York: Basic Books.
- Secretaría de Estado en los Despachos de Recursos Naturales y Ambiente de la República de Honduras (2010). *Estrategia Nacional de Cambio Climático*. Recuperada de: <https://icf.gob.hn/wp-content/uploads/2022/02/2010-Estrategia-Nacional-de-Cambio-Climatico.pdf>
- Secretaría de Gobernación, Justicia y Descentralización (2010). *Guía Metodológica: Elaboración Planes de Desarrollo Municipal (PDM) con enfoque de Ordenamiento Territorial*. Recuperada de: <https://www.jica.go.jp/project/honduras/0603085/materials/pdf/guideline08.pdf>
- Secretaría Técnica de Planificación y Cooperación Externa (2013). *Normativa para la formulación de planes de desarrollo municipal con enfoque de ordenamiento territorial*, Acuerdo no. 00132. Recuperada de: <https://www.tsc.gob.hn/biblioteca/index.php/normas/500-normativa-para-la-formulacion-de-planes-de-desarrollo-municipal-con-enfoque-de-ordenamiento-territorial>
- Segura, L. D., Van Zeijl-Rozema, A., & Martens, P. (2022). Climate change adaptation in Central America: a review of the national policy efforts. *Latin American Policy*.
- Smit, B., & Pilifosova, O. (2003). Adaptation to climate change in the context of sustainable development and equity. *Sustainable Development*, 8(9), 9.
- Thompson, M. (1990). *Cultural Theory*. New York: Routledge.
- Thompson, M. (2003). Cultural Theory, Climate Change and Clumsiness. *Economic and Political Weekly*, 38(48), 5107-5112. Retrieved from www.jstor.org/stable/4414349
- United Nations. (2019). Goal 13: Take urgent action to combat climate change and its impacts. Retrieved from <https://www.un.org/sustainabledevelopment/climate-change/>
- van Asselt, M. (2000). *Perspectives on Uncertainty and Risk: The PRIMA Approach to Decision Support*. Springer Science & Business Media.
- Verweij, M., Douglas, M., Ellis, R., Engel, C., Hendriks, F., Lohmann, S., . . . Thompson, M. (2006). Clumsy solutions for a complex world: The case of climate change. *Public Administration*, 84(4), 817-843. doi:[10.1111/j.1540-8159.2005.09566.x](https://doi.org/10.1111/j.1540-8159.2005.09566.x)

- Verweij, M., Luan, S., & Nowacki, M. (2011). How to test cultural theory: Suggestions for future research. *PS: Political Science & Politics*, 44(4), 745-748.
- Xue, W., Hine, D. W., Marks, A. D. G., Phillips, W. J., & Zhao, S. (2016). Cultural worldviews and climate change: A view from China. *Asian Journal of Social Psychology*, 19(2), 134-144. doi:[10.1111/ajsp.12116](https://doi.org/10.1111/ajsp.12116)

