

Assessment on the Legal Design of the National Climate Change Adaptation Strategy for the Agricultural Sector of Honduras

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Honduras and the Agricultural Sector

Honduras is the second largest country of Central America with a land area of 112,492 km², is bordered to the southeast by Nicaragua (922 km), to the southwest by El Salvador (342 km), to the west by Guatemala (256 km), to the south by the Pacific Ocean (153 km) and to the north by the Caribbean Sea (750 km)¹. Honduras is territorially divided into 18 Departments and 298 Municipalities. According to the National Institute of Statistics, the estimated population is 6,485,000 inhabitants (year 2001)², with large concentrations in the cities of Tegucigalpa and San Pedro Sula. In 2007, according to the Human Development Index (HDI) Report presented by the United Nations Development Program, Honduras presented a HDI of 0.7 with an annual growth rate of 0.94% since 1990, hence classified as a Medium Human Development country. With respect to the Human Poverty Index, Honduras ranks 61st out of a list of 135 poorest countries in the world; an estimated 51% of the population lives in poverty, of which 29.7% lives in extreme poverty with an income of US \$ 2/day³. Honduras has a diversified economy based on trade in agricultural products and manufacturing, making it one of the most diverse in Central America, however, it has been affected by significant external impacts and unexpected natural disasters that have delayed its economic growth⁴.

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¹ Honduras. Secretarios de Estado en los Despachos de Recursos Naturales y Ambiente. (2012). Segunda Comunicación Nacional del Gobierno de Honduras ante la Convención Marco de las Naciones Unidas sobre Cambio Climático.

² Supra note 1

³ Supra note 1

⁴ Supra note 1

In Honduras, 12% of gross domestic product (GDP) comes from agriculture. Total agricultural exports reached US \$ 3.47 billion in 2013⁵. Coffee, palm oil and bananas were the main sources of foreign currency. Also, 36% of the economically active population is related to the agricultural sector because it is one of the main sources of employment. The sector employs more than half of the employed population, many of them (over 30% of the total population and 54% of the rural population) live in families of small farmers producing maize, beans, rice and sorghum, which are the four most important crops for Honduran food. This sector is considered as the basis for subsistence and food security for the majority of Hondurans⁶.

Up to 41% of the Honduran population has food insecurity indexes and at least 8% of the population is within the global hunger index⁷. This situation is explained by the population's lack of access to food, low incomes, high levels of poverty and a continuous increase in prices. Over the years, a reduction of the food production is perceived between one harvest and another. The reasons of this problem lie in poor soil management, high deforestation of fragile and water-stressed forests, and the use of degraded land for subsistence farming and extensive livestock. The main impact of these practices is the degradation of water resources. These conditions influence on the loss of biodiversity, the reduction of the quality and quantity of water in the soils, and the increase of floods in the crops in the middle part of the basins⁸.

Challenges of the Agricultural Sector to Climate Change

According to the Germanwatch Global Climate Risk Index, Honduras was the country most affected by extreme weather events between 1996 and 2015 with a total of 61 events over this period. This ranking is attributed to the aftermath of exceptionally devastating events hitting the country such as Hurricane Mitch⁹. In Honduras, the death toll was close to 6,500

⁵ Honduras. SCASA/SAG/MTCC. (2014). Estrategia Nacional de Adaptación al Cambio Climático para el Sector Agroalimentario de Honduras (2014-2024).

⁶ Supra note 5

⁷ Supra note 5

⁸ Supra note 5

⁹ Germanwatch, 2016: Global Climate Risk Index 2017 [Sönke Kreft, David Eckstein and Inga Melchior]. Germanwatch e.V., pp. 32.

with up to 11,000 still missing due to this event¹⁰. At least 70% of crops were destroyed. Crop losses were estimated at \$ 900 million. The damage by Mitch to Honduran agricultural production will take years to recovery¹¹.

Important trends in precipitation and temperature rise have been observed in Central America. Climate projections foresee warming from +1.6 to +4 °C and rainfalls changes varying from -22 to +7% by 2100 in the region¹². This increase in temperature, accompanied by periods of drought and reduced rain, will cause water supply shortages and consequently, a change in areas suitable for crops. This coupled with climatic variability and extreme events (e.g. Hurricane Mitch) can have a major impact on the agriculture¹³. A study of climate change impacts on crops in the dry corridor of Honduras show the following results: there is a high probability of coffee rust predominance, especially under scenarios with more rainfalls and warmer temperatures; long dry periods represent a serious problem for the maize plants in their initial stages and they do not survive for a long time if the drought is accompanied by high temperatures; there is a moderate probability of reduced bean productivity due to changes in rainfall; there is a high probability of increased pests and common diseases that damage the potato crop, moreover, this crop is susceptible to both droughts and excess of water; droughts or excessive rains will have a negative impact on the initial stages of the lettuce plants¹⁴.

Agricultural Sector Adaptation

In a country like Honduras where agriculture plays such an important role, it is indispensable to guarantee the production of food in a sustainable way, taking advantage of resources without harming the natural capital. Maintenance and restoration of productive

¹⁰ NOAA National Climatic Data Center. (2009, January 23). 'Mitch: The Deadliest Atlantic Hurricane Since 1780' [WWW document] URL <https://www.ncdc.noaa.gov/oa/reports/mitch/mitch.html> (visited 2017, February 22)

¹¹ Ibid

¹² Magrin, G.O., J.A. Marengo, J.-P. Boulanger, M.S. Buckeridge, E. Castellanos, G. Poveda, F.R. Scarano, and S. Vicuña, 2014: Central and South America. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1499-1566.

¹³ Supra note 5

¹⁴ Supra note 5

ecosystems should be promoted through adaptation to climate change and thus ensure that future generations have abundant food and a prosperous agriculture¹⁵.

Climate change adaptation is defined as ‘adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects.’¹⁶ Climate adaptation law is likely to be a part of the adaptation process. New legal issues are arising and existing legal challenges could intensify, as human migration and new infrastructure could trigger disputes over land use, environmental, and civil rights policies; and some of the effects of climate change will present entirely new types of challenges for which we lack methods of adaptation. The objective of climate change adaptation policy includes two broad themes: reducing vulnerability to harms and increasing resilience to harms that are sensed. It is not yet clear what that implies at any given location or how to achieve it in a manner that is effective, efficient and equitable. Although adaptation is still a controversial topic, since 2005 there has been a considerable public and private effort to make up for the slow start of adaptation policy development¹⁷.

According to Honduras’s Intended Nationally Determined Contribution¹⁸, the priority of the country is undoubtedly adaptation to climate change in order to reduce its vulnerability. Honduras is a low-income country and has to face a number of development challenges, such as poverty, education, health, security, which overlap the challenge of adaptation. The country has made good progress in establishing a favorable regulatory and institutional framework to work towards reducing its vulnerability and adapting to climate change, as evidenced by the National Climate Change Adaptation Strategy for the Agricultural Sector¹⁹. This article intends to assess the principles used in the legal design of this Strategy in order to support future efforts regarding the adaptation of the sector in Honduras.

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¹⁶ J. B. Ruhl, ‘Climate Adaptation Law’, in *Global Climate Change and Law* 677 (ABA Press, Michael B. Gerrard & Jody Freeman eds., 2nd ed. 2014).; Vanderbilt Public Law Research Paper No. 14-36.

Available at SSRN: <https://ssrn.com/abstract=2514173>

¹⁷ Ibid

¹⁸ UNFCCC, Decision 1/CP.21, Adoption of the Paris Agreement, UN Doc. FCCC/CP/2015/10/Add.1.; See Article 4 of the Paris Agreement

¹⁹ Honduras. Gobierno de la República de Honduras. (2015). Contribución Prevista y Determinada a Nivel Nacional de la República de Honduras.

Design Principles for Adaptive Capacity in Legal Systems

J.B. Ruhl suggests the application of theoretical context and design principles for adaptive capacity in designing climate change adaptation law²⁰, noting that it should draw from theories of adaptive management²¹, dynamic federalism²², new governance²³ and transgovernmental networks²⁴. Adaptive management is an interdisciplinary approach relying on iterative cycles of goal determination, model building, performance standard setting, outcome monitoring, and standard recalibration. The adaptive management model comprises eight key steps: 1) definition of the problem, 2) determination of goals and objectives for management of ecosystems, 3) determination of the ecosystem baseline, 4) development of conceptual models, 5) selection of future restoration actions, 6) implementation and management actions, 7) monitoring and ecosystem response, and 8) evaluation of restoration efforts and proposals for remedial actions. This last step is critical²⁵.

The adaptive management theory is a response to the model of ecosystems as dynamic systems since they have high variability and low predictability to change. It is a call to move and commit to ecological resilience strategies continuously and flexible over time. Ecological resilience, under the resilience theory²⁶, is a type of resilience which 'is measured by the amount or magnitude of disturbance a system can absorb without having its fundamental behavioral structure redefined, a property known as resistance'²⁷. It depends

²⁰ J. B. Ruhl, 'General Design Principles for Resilience and Adaptive Capacity in Legal Systems - With Applications to Climate Change Adaptation', *N.C. L. Rev.*, 89.5, (2011), pp. 1373-1401

²¹ See J. B. Ruhl, Robert L. Fischman, 'Adaptive Management in the Courts', *MINN. L. REV.*, 95, (2010), pp. 424-484

²² Under dynamic federalism, 'federal and state governments function as alternative centers of power and any matter is presumptively within the authority of both the federal and the state governments.' See Kirsten H. Engel, 'Harnessing the Benefits of Dynamic Federalism in Environmental Law', *EMORY L.J.*, 56, (2006); see *supra* note 20.

²³ The central principles of new governance theory are stakeholder participation, collaboration among interests, diversity of and competition between instruments, decentralization, integration of policy domains, flexibility, and an emphasis on noncoerciveness and adaptation. See Bradley C. Karkkainen, "'New Governance' in Legal Thought and in the World: Some Splitting as Antidote to Overzealous Lumping", *MINN. L. REV.*, 89.2, (2004), pp. 471-497; see *supra* note 20.

²⁴ Transgovernmental networks theory emphasizes the nonhierarchical horizontal and vertical networks that are built among the *officials* of those institutions to exchange information, identify best practices, harmonize approaches and enforce the overall policy program'. See *supra* note 20; see Anne-Marie Slaughter, *A New World Order*, (Princeton University Press, 2004)

²⁵ *Supra* note 20

²⁶ See e.g., Lance H. Gunderson, C.S. Holling (Eds.), *Panarchy: understanding transformations in human and natural systems* (Washington DC: Island press, 2002), p.450

²⁷ *Supra* note 20

on adjustments to system processes as the means of managing overall system integrity. Ecological resilience is different to engineering resilience. Engineering resilience is measured by the time required for a system to return to an equilibrium following a disturbance, a feature called recovery. Both concepts envision a system that has been pushed off of its steady state by a disturbance. However, they differ in terms of the strategies the system uses to avoid being pushed so far as to be functionally restructured. Ecological resilience strategies embrace the possibility of fluctuating within a basin of attraction to equilibrium, aiming to avoid flipping from one structural state to another. On the contrary, engineering resilience strategies devote all systems resources to stay close to the equilibrium, aiming to turn back. Another difference between the two concepts has to do with the response diversity of the system, which is ‘the diversity of responses to disturbance among species or actors contributing to the same function in the social-ecological system’.²⁸ Response diversity enhances resilience because it opens up options; it is more likely to be borne by ecological resilience. Moreover, there are five key features of a system that contribute to their capacity to tolerate surrounding changes: reliability, efficiency, scalability, modularity and evolvability. Scalability, modularity and evolvability match up more closely with ecological resilience. Scalability is robustness to changes to the size and complexity of the system. Modularity is robustness to structured component rearrangements. And evolvability is robustness of lineages to changes on long time periods. Given that future climate change impacts are expected to continue being of high variability and low predictability, ecological resilience strategies may provide an enhancement of the resilience and adaptive capacity of the legal system designed to respond to them²⁹.

National Climate Change Adaptation Strategy for the Agricultural Sector of Honduras (2014-2024)³⁰

The Strategy adopts the conceptual framework of Adaptation to Climate Change and Disaster Risk Management (ACC&DRM) due to the increased synergies between these two concepts. Risk management is, in a way, a mechanism for adaptation focusing on prevention of events rather than response or risk reduction. Multiculturalism is recognized and appreciated in the design of policies and proposals of the Strategy too. Indigenous communities are another important capital when it comes to participatory management of

²⁸ Supra note 20

²⁹ Supra note 20

³⁰ Hereinafter, the Strategy.

natural resources, which in a context of climate change becomes more relevant because it would also allow an adequate management of conflicts. The Strategy also adopts the gender equity approach and the human development and capacity building approach³¹.

The process of formulating the Strategy consisted of a series of steps. First, a Working Group (WG) in the Secretariat of Agriculture and Livestock (SAL) was created. The WG is an instance of consultation and construction of proposals from the SAL, which will be strengthened with the creation of the Unit of Climate Change and Risk Management of the SAL (UCC&RM). Second, the definition and consensus of the methodological route for the formulation of the Strategy and its presentation to the Sub Committee on Agriculture and Food Security (SCAFS), which involves various public, private and international cooperation agencies. Third, workshops with the WG and national contributions (Permanent Commission of Contingencies and others) were carried out for formulating the vision, strategic objectives, expected results, indicators, and specific strategies for achieving results. Fourth, with the support and advice of national experts hired by the CliFor-GIZ Program³², the UCC&RM through the WG has identified the various studies of vulnerability analysis, diagnoses, studies carried out by various entities and institutions, to order, review and systematize them. Fifth, with an advanced drafting of the Strategy, three National Validation Workshops were carried out with the participation of agrarian organizations, municipalities, international cooperation organizations, and others. The most relevant contributions were collected and incorporated as additional contributions. Sixth, the Strategy was presented and approved by SCAFS, after having passed the consultation process. Finally, the SAL, through an Executive Resolution, recognizes the Strategy as the political instrument for launching proposals and mechanisms for ACC&DRM in Honduras. The document was publicly presented³³.

The WG is the most important instrument in the elaboration of the Strategy. The SAL, through the WG has established intra-institutional relations between the National Agricultural Health Service, the Directorate General of Fisheries and Aquaculture, the Directorate of Agricultural Technology and Science, the National Agrifood Development

³¹ Supra note 5

³² Instituto de Conservación Forestal. (n.d.). 'CLIFOR' [WWW document] URL <http://icf.gob.hn/index.php/condo-remodeling/> (visited 2017, March 02)

³³ Supra note 5

Program and the National Program for the Promotion of Irrigated Agriculture. Moreover, the Technical Unit for Nutritional Food Safety and the link between the Secretariat of the Presidency and the SAL also participated in the workshops³⁴.

The vision of the Strategy is, by 2024, to have led and generated mechanisms of agreement and synergy for the reduction of agroclimatic vulnerability and the increase of resilience and adaptability in the agrifood sector of Honduras. The basic criteria guiding and supporting the Strategy are the following: 1) Emphasis on food security as the main measure to protect the most vulnerable people and sectors; 2) emphasis on the design and implementation of measures to adapt to climate change, priority in short and medium term responses, without losing sight of the long term (simultaneously addressing the urgent); 3) prioritization of the sectors, territories and human populations most vulnerable and impacted by climate change; 4) in line with the available and potentially mobilizable competencies, capacities and resources of the SAL; 5) in line with the SAL's scope of action, with inter-institutional coordination and synergy, and intersectoral coordination³⁵.

The Strategy has been structured in four Strategic Axes (SAs), whose scope has been defined by Strategic Objectives (SOs). The SOs were formulated through an analysis of strengths, weaknesses, opportunities and threats (SWOT); with a time horizon of 10 years and considered fundamentally as a learning process. Each SO comprises a group of results, indicators for verification, strategies to achieve the results and a responsible, partners and allies³⁶.

The first SA (SA-1) is the institutional strengthening of the SAL in matters of human capacities (resources) for environmental management, adaptation to climate change and agroclimatic risk management. The SO 1.1 is for the SAL to constitute the UCC&RM as the specialized body to promote the incorporation of ACC&DRM into its planning and budget. The UCC&RM will coordinate, propose, monitor and consult aspects of policies management and organizational proposals. This is expected to be done by a published executive agreement in *La Gaceta*. Also, an operating regulation will be prepared for the WG, which will create working agreements with all the institutions of the SCAFS and will be

³⁴ Supra note 5

³⁵ Supra note 5

³⁶ Supra note 5

consolidated as the Specialized Advisory Platform of the SAL. The SO 1.2 is for the SAL to strengthen its technical and technological capabilities in the institutional structure related to the operation of the SCAFS, the WG and the UCC&RM. By 2016, a trained and qualified institutional team is expected to guide and advise the mainstreaming of the adaptation issue, and the interagency and intersectoral synergistic approach of climate change³⁷.

The second SA (SA-2) is the coordination and harmonization of prevention and response actions to extreme events with emphasis on droughts and floods. The SO 2.1 is for the SAL to harmonize and coordinate mechanisms and actions with the public sector, private organizations and agrarian organizations to achieve practical proposals that contribute to the reduction of the impacts caused by droughts and floods in the agrifood sector. The SO 2.2 is the promotion and support of practices that contribute to local food security through agrifood production, with emphasis on continental and maritime aquaculture production, giving priority to small producers with a focus on gender equity and interculturality³⁸.

The third SA (SA-3) is the strengthening of technical capacities of the SAL to design and implement ACC&DRM measures. The SO 3.1 is to increase the adaptive capacity and resilience of productive systems to temperature increases, changes in rainfall patterns, droughts and flood events, and the incidence of pests and diseases caused by climate change. By 2020, each program, project and service of the SAL is expected to have specialists in ACC&DRM; who lead, advise and facilitate the policies of the Strategy in the agrifood sector. Also, new technologies are expected to be incorporated as part of the farmers' productive system. The establishment of guidelines for reducing the incidence of pests and diseases through Integrated Pest Management is also contemplated. The SO 3.2 is to prevent the reduction of the volume of water available, improving its quality through proper management of the basin and prioritizing projects and programs of water securing³⁹ as an investment for adaptation. By 2020, public investment in water securing projects (e.g. water harvesting) is visualized, providing irrigation water in a higher percentage to the most vulnerable families that are exposed to the impacts of droughts. The SO 3.3 is for the SAL to promote and facilitate intersectoral mechanisms for access and timely use of

³⁷ Supra note 5

³⁸ Supra note 5

³⁹ Water Securing is used by the National Water Authority in Peru to define a process of investment in irrigation infrastructure, strengthening of organizations of water users for irrigation, and increased water efficiency in irrigation. See supra note 5.

agroclimatic and hydro-meteorological information for the design of adaptation measures and agroclimatic risk management purposes. A Participatory Community Network for Agroclimatic Risk Management of Honduras will be formed, which will contribute to the design and implementation of ACC&DRM measures and by 2016, with support of the SAL, will validate some of these measures for three pilot zones in the country⁴⁰.

The fourth SA (SA-4) is the articulation and alliance with research networks and other sources that generate innovation, research, technology, knowledge and information systems for climate change adaptation. The SO 4.1 is for the SAL to promote inter-learning to strengthen the design and implementation of adaptation measures in the agrifood sector on priority issues, taking advantage of national and international networks. By 2017, an inter-learning alliance with international and national research networks and technology transfer networks will be established. The SO 4.2 is to promote the incorporation and expansion of good agricultural practices for ACC&DRM in the national agrifood sector to protect and promote sustainable agriculture that favors food and nutritional security, in coordination and synergy with the Secretariat of Natural Resources and Environment. Moreover, a program to rescue ancestral good practices will be established. The SO 4.3 is to encourage the design and establishment of a national climate observation system, which would be under the responsibility of the National Center for Atmospheric, Oceanographic and Seismic Studies (NACAOS); and it will be linked to the UCC&RM. An agreement between NACAOS, the Permanent Commission of Contingencies and the UCC&RM for the exchange of agroclimatic information will be set⁴¹.

Discussion and Conclusions

First, I would like to commend the innovative approach on gender equity of the Strategy. Ruhl does not mention this concept per se, but it is in line with the new governance theory⁴² as it fosters diversity of instruments and collaboration among interests. Not to mention that it matches with the new Sustainable Development Goals of the United Nations since Goal 5 is Gender Equality⁴³.

⁴⁰ Supra note 5

⁴¹ Supra note 5

⁴² Supra note 23

⁴³ United Nations. (2015). 'Sustainable Development Knowledge Platform' [WWW document] URL <https://sustainabledevelopment.un.org/sdgs> (visited 2017, March 03)

The second point that is important to highlight is its multi-party, multi-level and synergistic governance which is also a turn towards new governance⁴⁴ and dynamic federalism⁴⁵. The SCAFS, led by SAL, is composed of government institutions, academia, international cooperation and civil society, as a coordinating body of the agrifood sector of Honduras. The UCC&RM is inserted within the organizational structure of the SAL too and is attached to the Ministerial Office. The UCC&RM's functions are to transcend the scope of SAL and incorporate actions under a synergistic approach that considers the different relevant governmental and non-governmental sectors and actors. The UCC&RM coordinates the WG, which is composed by official and technical representatives of the General Directorates of the SAL, as well as official representatives of other programs, projects and services of this Secretariat. Also, important to note that public participation is an essential matter for the Strategy⁴⁶.

The Strategy also considers the transgovernmental networks theory⁴⁷ as it can be reflected in the SA-4 aiming to establish an inter-learning alliance with international and national networks and allow the exchange of information and identification of best practices⁴⁸.

In essence, the Strategy accomplishes most of the key steps of the adaptive management model since it defines the main problem; sets clear goals and objectives; through the studies of vulnerability and diagnoses, sets the baseline for the ecosystems; develops conceptual models; selects future restoration actions with the support of numerous stakeholders; fosters the implementation and management actions; and monitors the actions through indicators. However, the Strategy does not include ecosystem response monitoring and the evaluation of actions taken. According to Ruhl, the latter is crucial in order to take remedial actions⁴⁹.

Additionally, the Strategy can be coupled with ecological resilience strategies, as it aims for the ecosystems to be resistant to the impacts of climate change and promotes a diversity of responses. The Strategy allows the systems to change in temporal and spatial scales

⁴⁴ Supra note 23

⁴⁵ Supra note 22

⁴⁶ Supra note 5

⁴⁷ Supra note 24

⁴⁸ Supra note 5

⁴⁹ Supra note 20

(scalability), to change their functions and components (modularity) and to prepare themselves for these changes over a long time period (evolvability)⁵⁰.

The Strategy embodies an important synergistic endeavor among numerous national and international stakeholders, institutions and networks aiming to guarantee the food security of the Honduran population. The Strategy could improve in terms of reflecting flexibility over the time in its different SAs, perhaps within the SOs' indicators or enhancing the variety of policies to achieve the expected results and the links with the relevant Ministerial Offices. Moreover, it's important to introduce evaluation methods of adaptation projects and actions. The Strategy states the SOs are a learning process, thus is important to monitor not only that the actions are undertaken but their effectiveness and the ecosystems' responses to them. These are recommendations that should be taken into account for future efforts such as the elaboration of the Honduras's National Adaptation Plan⁵¹.

⁵⁰ See supra note 20

⁵¹ United Nations Framework Convention on Climate Change. (n.d.). 'National Adaptation Plans' [WWW document] URL

http://unfccc.int/adaptation/workstreams/national_adaptation_plans/items/6057.php (visited 2017, March 03)

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