Julie Asselin

CLIMATE JUSTICE IN THE CARIBBEAN: POLICY-MAKING IN THE WATER SECTOR

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Supervised Research Report

Submitted to Professor Madhav Badami

School of Urban Planning

McGill University

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Abstract

Climate justice has been at the forefront of policy debates in the international arena in the last two decades. Climate change politics provide a practical ground to explore conflicting claims to environmental justice in the literature. In addition, a key question is how to operationalize Environmental Justice in policy-making. This report pays particular attention to climate policy in the context of Small Island Developing States (SIDS) in the Caribbean, a region disproportionately affected by climate variability. It explores how climate justice is articulated and understood in Caribbean policies, with a particular focus on the water sector in Jamaica. The research evaluates justice according to the following questions: What environmental justice paradigm informs the shift in the Jamaican policy-making process regarding water management? How is the sustainability model defined? How do the policies deal with complexity? The research identifies a potential gap between policy goals and climate justice concerns, and raises a number of questions regarding Jamaica's capacity to translate policy aspirations into practice. The analysis finds that there is little explicit focus on inequality across governments, households, and geographic areas in the policy arena, and no clear debate on the political and economic factors that generate and maintain differing abilities to cope with climate change. Moreover, it highlights major concerns regarding local capacity building in adopting and implementing planning-related efforts towards sustainability and an integrated approach to address climate change. The report also questions how a lack of resources may impede the capacity of the Jamaican government to deal with the complexity associated with climate variability. Furthermore, the lack of multilateral cooperation, the lack of financial and technical resources, and the lack of bottom-up mechanisms that connect stakeholders at all levels in regional environmental cooperation adds another layer of complexity in the Caribbean policy arena.

Keywords: Environmental Justice, Climate Justice, Small Island Developing States (SIDS), Climate Policy-Making, regional cooperation, water management.

Résumé

La justice climatique a été au premier plan des débats politiques sur la scène internationale depuis les deux dernières décennies. Les politiques sur les changements climatiques constituent un terrain pratique pour explorer les demandes contradictoires à la justice environnementale présentes dans la littérature scientifique. Cependant, la question reste à savoir comment opérationnaliser la justice environnementale dans les processus décisionnels. Cette recherche porte une attention particulière aux politiques climatiques dans le contexte des petits États insulaires en développement (PEID) dans les Caraïbes, une région touchée de manière disproportionnée par les conséquences de la variabilité du climat. La recherche explore la manière dont la justice climatique est articulée et comprise dans les politiques régionales, en particulier dans le secteur de l'eau en Jamaïque. Elle évalue la justice selon les questions suivantes: Quels paradigmes de la justice environnementale influencent la réorientation des politiques climatiques en Jamaïque en matière de gestion de l'eau? Comment le modèle de développement durable est-il défini? Comment les politiques traitent-elles la question de la complexité? L'analyse identifie les écarts potentiels entre les objectifs des politiques environnementales et les préoccupations relatives à la justice climatique, et s'interroge sur la capacité de la Jamaïque à traduire ses aspirations politiques dans la pratique. L'analyse démontre que peu d'attention est portée sur les inégalités entres les gouvernements, les ménages et les régions géographique dans l'élaboration des politiques. De même, aucun débat clair n'est présent sur les facteurs politiques et économiques qui engendrent et maintiennent les capacités inégales à faire face aux changements climatiques. En outre, la recherche met en évidence les principaux enjeux concernant le renforcement des capacités locales dans l'adoption et la mise en œuvre d'une planification durable et d'une démarche intégrée. L'analyse soulève aussi la question suivante : comment le manque de ressources peut affecter la capacité du gouvernement Jamaïcain à faire face à la complexité liée à la variabilité du climat. Enfin, le manque de coopération multilatérale, le manque de ressources financières et techniques, ainsi que l'absence de mécanismes de la base au sommet qui relient les parties prenantes de la coopération régionale ajoute un autre niveau de difficulté dans le domaine des politiques dans les Caraïbes.

Mots clés : Justice environnementale, Justice climatique, Petits États insulaire en développement (PEID), Politiques climatiques, coopération régionale, gestion de l'eau.

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INTRODUCTION

Small Island Developing States (SIDS) around the world are disproportionately affected by the changing climate. The vulnerability of SIDS arises from the interplay of several factors: their location and topography, their physical and political size and geographic dispersion, their strong reliance on the world economy, and their limited resilience to natural disasters (Kelman, 2010).

According to the Inter-Governmental Panel on Climate Change (IPCC), the countries of the Caribbean are among the most susceptible to the likely impacts of climate change. The rising sea level, amplification in the frequency and intensity of tropical storms and hurricanes, and disruptions in rainfall and fresh-water supply threaten the very existence of the SIDS in the region (CCCCC, 2009a). Particularly important for the Caribbean is the prospect of accelerated sea level rise, leading to shoreline erosion, inundation of low laying areas, higher water tables, salt water intrusion, and property loss on coastal areas. Considering the fact that small islands in the region contribute very slightly to climate change, they are subject to disproportionate risks (Mycoo and Gobin, 2013). Further global warming will only reinforce existing environmental, social and economic vulnerabilities in the region. This phenomenon calls for reflections around climate justice, especially regarding the regional policy sector.

Water availability is a key issue. Many of the Caribbean Islands (Antigua and Barbuda, Barbados, Dominica, Jamaica, Saint-Lucia, Saint-Vincent and the Grenadines and Trinidad and Tobago) are ranked as the top countries facing water stress in the world (United Nations Environment Programme (UNEP), 2008). Climate modeling for the Caribbean region under a range of scenarios suggests a continuation in increasing average temperatures. The average temperature rise can lead to shifts in precipitation patterns such as an expansion of the dry season, and an increase in frequency of occurrence of drought conditions (London, 2007). Even moderate shifts in rainfall patterns could have substantial impact on water supply and agricultural productivity. In terms of water resources, there is little water storage capacity, especially in small island settings, which is already contributing to water scarcity (London, 2007).

The growing concerns around climate variability in the region have shed light on a crucial justice dimension; the limited regional and national capacity to respond and adapt to climate change, as the region is already struggling to cope with present day climate variability.

The ongoing development of the small islands for tourism has led to unprecedented pressure on water resources (Cashman, Nurse, & John, 2009). It also rendered the economies of the small Caribbean states particularly vulnerable to crisis (Cashman et al., 2009). In fact, the majority of the countries shifted to a tourism-based economy in the last decades. This shift has spurred urbanization in coastal areas. On the one hand, the growing urbanisation and urban concentration in Low Elevation Coastal Zones (LECZ) increase vulnerability of number of citizens (London, 2007). Particularly susceptible to climate change are the disadvantaged settlements, namely the informal settlements (Middelbeek, Kolle, & Verrest, 2014). Besides, inadequate settlement patterns and agricultural land use practices have accelerated erosion and water runoff, which in turn, have challenged water management. On the other hand, the agricultural sector is very likely to suffer from climate inconsistency with frequent incidences of drought and flooding, which affect food production for local and foreign markets. Besides, this is concerning since the sector accounts for the largest share of water demand. Unfortunately, the planning authorities of many territories of the region, including Trinidad, Jamaica, Antigua and Barbuda and the Bahamas, struggle to manage the pressure for land use changes in response to urbanization (Rajack & Barhate, 2004).

Since the mid-90's, the Caribbean countries have been involved in international negotiations and have implemented a range of national capacity building activities. This involvement has accelerated work on regional climate policy. Yet, policies and frameworks have often the tendency to disregard the underlying causes of climate vulnerability, which are compounded by poverty, limited resources, inadequate infrastructure and weak and ineffective systems of governance (Middelbeek et al., 2014). Particularly important are the interaction of the built environment and human activities that exacerbate climate change impacts. The situation raises question as to how policies actually address inequalities in capabilities of governments and other actors to cope with climate variability.

How is climate justice articulated and understood in the Caribbean climate policy? How is vulnerability and local inequalities addressed? Who are the main stakeholders shaping environmental discourses and cooperation? How is justice operationalized in the water sector, where a range of user conflicts exist, and can be exacerbated under climate variation?

This research will consider these questions. First, the project explores how Environmental Justice (EJ) and Climate Justice (CJ) have been conceptualized in the literature, especially

from the perspective of low-income countries and the SIDS. Second, it will review practices, concepts and benchmarks to evaluate policy and plans, with a particular attention to justice dimensions in the policy making process. The third section will look at major issues in policy-making and the water sector in the Caribbean region. In light of the review, the fourth section will analyse national responses in the Jamaican climate governance and water sector. The analysis will take into account their most recent *National Climate Framework*, as well as the *Draft Jamaica Water Sector Policy*. Finally, the conclusion will provide recommendations for researchers and for professionals involved in the planning sector in SIDS.

CHAPTER 1: LITERATURE REVIEW

Climate change has become one of the most complex environmental issues today due to the multi-faceted nature of current and potential impacts at the global scale (Ikeme, 2003). The global phenomenon has raised major environmental justice and equity concerns in term of distribution of impacts, responsibility, costs and benefits (Ikeme, 2003). This chapter first explores the context of theorization of Environmental Justice and Climate Justice. Then, it explores climate justice both from the perspective of low-income countries and Small Island Developing States (SIDS). Finally, it investigates water justice as an emerging concept.

From Environmental Justice

Environmental justice (EJ) is a relatively recent concept. Ranganathan and Balazs (2015) define it as a policy and scholarly vocabulary that grew out of activist concerns around the racially unjust distribution of environmental externalities. It first emerged in the United States (Ranganathan & Balazs, 2015). Even though negative environmental externalities have been experienced since the industrial revolution, and particularly throughout the 20th century, the documentation on Environmental Justice as an issue of policy concern has occurred mainly in the last 40 years (Byrne, Martinez, & Glover, 2002).

Historically, EJ arose from resistance movements aiming to expose the environmental risks and effect of industrial development. Environmental activism has been particularly present among US-based social movements and academic discourses. In the 70s and the 80s, federal agencies and scholars began to confirm patterns of disproportionate exposure of toxic waste and polluting practices experienced by low-income populations and communities of color (Bullard, 1994; Mehta, Allouche, Nicol, & Walnycki, 2014). For example, in 1983, the U.S. General Accounting Office found that African-Americans constituted the majority of populations living near hazardous landfills (Cox, 2013). Robert Bullard, considered as the father of Environmental Justice, has been quite active in documenting the prevalence of environmental hazards on at-risk communities, and advocating against identifiable patterns of injustice (Bullard, 1994). His work on “environmental racism” remains central in EJ theory (Bullard, 1994).

Environmental Justice has also been framed through the attempt to connect toxins, ecology, and human health, in both urban and rural contexts. In her forceful book *Silent Spring*, Carson (1962) shed light on these connections by exposing the systematic use of pesticide and other chemicals to control nature, which in turn, causes excessive harm to human and wildlife health (Carson, Darling, & Darling, 1962)

In the last decades, the rise of a global economy and patterns of deindustrialization of the North have shifted environmental pollution from the industrial to the low income-countries. With this shift came deep justice concerns and debate at the international level. The concept of environmental justice has thus given rise to other forms of social movements, a research field and a policy vocabulary. In many developing countries, questions of the North–South divide in environmental inequality have inspired new activism. NGOs such as *Greenpeace, No-Nukes Asia Forum, Friends of the Earth* and *Third World Network* brought attention to the international waste trade, toxic wastewater, nuclear energy risks, etc. As globalization exacerbates cross-border environmental challenges, environmental justice is increasingly becoming an international movement.

This phenomenon has propelled many activists and scholars to examine environmental injustice through the lens of political economy. Many scholars from the Global South have shed light on the maintenance of a pollution systems by multinational corporations and international financial institutions (Agarwal, Narain, & Sharma, 2002; Byrne et al., 2002; Shiva, 2010). Shiva (2009) has been particularly active in highlighting the intertwined crises of food insecurity, oil and climate change, and by condemning the use of biotechnologies as a systematic response that is exacerbating food insecurity in India (Shiva, 2008)As the environmental crises is growing, EJ has evolved towards Climate Justice

To Climate Justice

For the most part, discussions on Climate Justice have evolved from broader theories of Environmental Justice. Environmental justice movements have grown and evolved to take on new global dimensions. Indigenous movements, such as *First People Worldwide*, have long been promoting traditional Indigenous knowledge to solve today's challenges, including climate change (First People Worldwide, 2016). Indigenous communities are among the most critically affected by the changing climate since their lives are tied to the access of common resources (Byrne et al., 2002). Other Global networks (such as *Climate Justice Actions*) and other climate justice organizations (*Alliance of Small Island States* and *Small Island Voice)* have been raising red flags on the disproportionate risks of climate change on low-laying zones and small island states. Special attention has been paid to the increasing vulnerability of low-income countries in facing impacts of climate change. From a political economy point of view, the vulnerability of developing countries results from global economy forces and the lack of resources at the local level to respond to climate change risks (Byrne et al., 2002). A fundamental justice concern arises since increased concentrations of GHG in the atmosphere, responsible for global warming, are predominantly resulting from the activities of developed

countries (Ikeme, 2003). Besides, whereas the developing countries, which are more heavily at risk, have little capacity to confront the challenges imposed by climate variability, the less threatened developed countries have greater financial and technical capacity to cope with current and projected environmental burden.

A large part of the climate change literature has emphasized the exacerbation of local inequalities and poverty resulting from the changing climate in the Global South (Girard, Boulanger, & Hutton, 2014; Grineski & Collins, 2008; Mehta et al., 2014; Ranganathan & Balazs, 2015). Other examinations of international patterns by scholars and activists have emphasized the link between social justice and environmental justice. Taylor (2000) pays particular attention to the environmental discourse framing Global Environmental Justice (GEJ). Taylor argues that GEJ is an important multidisciplinary concept building on the 'Environmental Justice Paradigm', aiming to link environment and race, class, gender, and social justice concerns in an explicit framework (Taylor, 2000). In the same line, Ikeme (2003) argues that differing approaches on the ethical concepts of equity and environmental justice in the environmental literature requires a unifying framework. The author suggests that environmental justice comprises all justice issues (including social equity), particularly in the field of environmental decision-making (Ikeme, 2003).

Climate justice has been linked to many ecofeminism approaches. In the literature, there is a strong recognition that the social and economic burden of natural disasters (such as flooding and droughts) falls mostly on women, especially in developing countries (Faiz Rashid, 2000; Shiva, 2010). Faiz Rashid (2000) portrays the direct effects of one of the major floods in 1998 on the urban poor in Bangladesh's capital, Dhaka. She argues that women are particularly vulnerable to shelter damage (Faiz Rashid, 2000). Domestic tasks for women such as cooking and fetching water become very difficult to undertake during a flood, especially with covered tube wells and contaminated reserve tanks and tube wells. Moreover, several studies exploring gender dynamics between poor women and men living in urban slums found that domestic violence in marriage is tolerated and a common occurrence. In the context of disasters which restrict access to basic needs, domestic violence is generally greatly amplified (Faiz Rashid, 2000). On the other hand, Shiva (2010) brings to light that human-made activities (commercial exploitation of forest, overexploitation of ground water for commercial crops, and inappropriate afforestation) have first and foremost engendered water crises in India, which is now exacerbated by climate change. The burden of water scarcity in many Indian regions falls on women, who are forced to walk longer distance to fetch drinking water. In some cases, households move to urban areas since the lack of water impede any local agriculture and livelihood opportunities (Shiva, 2010).

The ongoing broadening of the concept of EJ in recent years enabled the understanding of climate change not just as an ecological issue, but as a human right issue in terms of access to resources, recognition, and meaningful participation in resource management (Joshi, 2014). As a result, climate justice discourses often refer to a rights-based approach with a focus on human rights. The rights-based approach is particularly present in global environmental justice discourses advocating for water access. Critics highlight that rights-based assumptions are embedded in western liberal-rights frameworks, and that the approach, in some way, contrasts with the concept of the common good. Concerns are raised that the human rights advocates in EJ movements may place emphasize on individualistic rights (Mehta et al., 2014). Bond (2013) suggests that the rights-based approach tends to be disconnected from broader socio-economic and ecological processes (Bond, 2013). This is even more complex in contexts where access to resources operates through informal sets of practices. Urban fringe and informal settlements are good examples where the rights-based approach is insufficient to fully grasp justice concerns in water access (Mehta et al., 2014; Ranganathan & Balazs, 2015).

In policy-making, Climate Justice refers often to intergenerational and intragenerational equity. The mere principle of sustainable development, as it stands in most policy, embodies the former. In fact, "Sustainable developments is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs"(Brundtland, 1987, p. 8). Despite its apparent simplicity there is no general agreement on how the term should be translated into reality (Berke & Conroy, 2000). Building on intergenerational equity, Berke & Conroy (2000) suggests an exhaustive definition of the concept which help grasps a set of sustainability principles: "Sustainable development is a dynamic process in which communities anticipate and accommodate the needs of current and future generations in ways that reproduce and balance local social, economic, and ecological systems, and link local actions to global concerns" (Berke & Conroy, 2000, p. 23). Besides, international justice discourses in the development of environmental policy have raised concerns regarding intragenerational equity. The publication of the highly influential *Brundtland Report* (Our Common Future) explicitly contextualised environmental sustainability as an issue of, not only intergenerational but also intragenerational equity (Brundtland, 1987; Okereke, 2006). Intragenerational equity stands as a fundamental climate justice concern in contexts of high vulnerability and social and gender inequalities.

Finally, climate justice has been at the forefront of policy debates in the international arena in the last couple of years. However, the question remains of how to operationalize EJ in policy-making. CJ is now emerging in local policy levels as local governments are increasingly dealing directly with climate impacts. Bulkeley et al. (2013) examined justice discourses in 100

global cities around the world, and found that direct justice concerns in climate policy are most frequent in North America, which resonates with the history of the environmental justice movements (Bulkeley, Carmin, Broto, Edwards, & Fuller, 2013). In discussing leading roles, they also demonstrated that local governments are the most likely actor to take the lead in climate change initiatives. However, studies led by community-based organisations and non-governmental organisations have proven to include aspects of justice dimensions more frequently than those initiated by municipal governments (Bulkeley et al., 2013). Moreover, Ikeme (2003) notes that the concepts of equity and environmental justice remain broadly misused and misinterpreted in the literature, and especially in the climate politics (Ikeme, 2003). This apparent confusion will be discussed in the methodology section.

The above discussion has emphasized the emergence and the theorization of the concept of environmental justice. Despite the fact that EJ is rooted in local struggles over environmental risk, most debates on climate justice remain framed at the international level. Consequently, the following section will emphasize the justice dimension in the international realm both from Low-income countries and SIDS perspectives, and especially in the Caribbean region.

Climate Justice from the Low-Income-Countries Perspective

In the world of international climate negotiations, Agarwal et al. 2002 identify three main camps of nations. The first camp encompasses nations that pay deep attention to global warming and who take broad actions. This group includes the Small Island States (SIS) who face disproportionate risks, as well as some European nations led by pro-environmental parties. The second camp encompasses most developed nations which opt for low cost solutions as possible. This group is mainly led by the US. The third group, led by India, China and other developing nations, insist on equitable and socially just actions that allow appropriate environmental space for their economic growth (Agarwal et al., 2002).

Global South Justice Discourses in International Climate Negotiations

> ‘‘People who have created this problem are not going to suffer from this problem, as much as people who have not. So the poor are likely to suffer, developing countries are likely to suffer more [than] the developed ones’’ Interview, Chandra Bhushan/CSE, retrieved from (Joshi, 2014, p. 681).

The prosperity of industrialized nations correlates with years of emissions, which have accumulated in the atmosphere since the industrial revolution. In the climate change literature, Agarwal et al. (2002) particularly insist on the link between nation’s GHG emissions and its economy; the more prosperous a country becomes, the higher its per capita income and fossil fuel consumption and accordingly, the higher its GHG emissions (Agarwal et al., 2002). In this

respect, the international community has struggled over the years to operationalize the overarching principle of justice that demands compensation for past and ongoing responsibility for climate change. Instead, for the most part, climate negotiations have been less about protecting the global environment than about protecting national interest.

International negotiations on climate mitigation have turned into an intensely political battle. For instance, the GHG reduction target of 5.2% below 1990 levels set under the Kyoto protocol, for the period 2008-2012 highlighs critical tension over how the target would be met for developing countries (Agarwal et al., 2002). The Kyoto protocol sought to strengthen the global response to climate change with the establishment of legally-binding emission reduction targets. It suggested more or less equal emission reduction targets with little reference to the historical GHG emissions (Agarwal et al., 2002). Emphasis was put on the rightness or effectiveness of the outcome rather than the justness of the steps towards it (Ikeme, 2003). From one end of the spectrum to the other, industrialized nations have remained unwilling to compromise their lifestyle, while low-income countries have been unwilling to restrain their potential for economic growth (Agarwal et al., 2002).

For the most part, the world's developing countries have industrialized in the last couple of decades. In the global economy, any limit on carbon emission has turned out to be a limitation on the "right to develop". For many low-income countries now fully integrated in the world economy, climate justice translates into a form of economic justice—the right to develop—especially for India and China. Space is needed for growth. And so, the second element of the Global South conception of environmental justice entails distributive justice, meaning a "fair share" of the benefits and resources available (Ikeme, 2003). Following the logic of development, it is understood that developed nations are the ones that have disproportionately appropriated the globally owned common property of the atmosphere. That appropriation resulted in higher levels of wealth, economic development and standard of living; it constitutes an "ecological debt" (Ikeme, 2003).

Finally, low-income countries seek increased participation in the climate change response process. In that sense, distribution of costs and benefits of the atmospheric resources can only be equitable if it results from a process that is agreed upon by all parties, especially those who are the most affected by the decisions. According to Ikeme (2003), developing countries have a relatively low representation in IPCC and other agencies of climate protection, particularly in terms of their impact in the climate change agenda and processes (Ikeme, 2003). Fair representation and participation are thus core justice dimensions, as we will see below.

The justice aspects can be illustrated in the case of India. Shangrila Joshi (2014) portrayed the environmental justice perspective in Indian discourses based on the country's participation in international negotiations (Joshi, 2014). Described environmental justice approach highlight the historical and ecological debt of the North towards the South, and the right of the South to develop and to benefit from their economic growth within appropriate environmental space (Joshi, 2014, p. 679). Environmental justice approach among Indian officials lies within a neoliberal paradigm with an emphasis on economic growth based on a fair use of the atmosphere as a sink for greenhouse gases. Shangrila Joshi (2014) breaks down the plural meaning of economic growth. On one hand, growth is seen as a valid right on its own, necessary for economic equalization between states. On the other, it is a precondition for achieving the country's objectives of meeting the basic needs of its citizens notably the ''eradication of poverty through industrialization, education and domestic energy consumption'(Joshi, 2014, p. 685). However, the author highlights that India's economic prosperity has not translated directly into increased well-being of its marginalized and underserved populations; such dynamics suggest that economic justice between states may not be sufficient to strengthen India's capacity to improve well-being of its citizens, or to mitigate and adapt to climate change (Joshi, 2014). Through interviews, Joshi (2014) noted the tendency among officials to avoid discussing the topic of domestic inequities. Sovereignty issues were used to justify such circumvention (Joshi, 2014). Ranganathan and Balazs (2015) specify that the country continues to be dominated by elite interests, and that specific environmental regulatory and legislative instruments tend to be used to advance elite and middle-class interests especially in urban India, at the expense of the poor. So is Indian elites' notion of justice a "hiding behind the poor" political strategy? Joshi and others suggest that climate negotiations have been less about protecting the global environment, or even addressing poverty, than about protecting elite interests.

The Indian official perspective on climate justice raises broader questions: Whose environmental justice is discussed in international climate negotiations? How are the needs and concerns of the marginalized and underserved population represented? And very importantly, what have been the effects of the structural adjustment in the planning, land-use policy and development in low-income countries? How did it affect access to resources, namely water? How did it shape the Global South conception of CJ? The following sections will discuss climate justice from the SIDS perspectives, with particular attention to the Caribbean region.

Climate Justice from a SIDS Perspective

From the above, we have seen that international policy development has highlighted the antagonisms between economic interests and those of the community, sustainability and environment. These antagonisms are particularly obvious when exploring climate justice from the SIDS perspectives.

Within international climate negotiations, Agarwal et al (2002) categorize SIDS nations in the "first camp" those which pay deep attention to global warming and which take broad actions (Agarwal et al., 2002). SIDS became concerned very early about the harmful impacts of the changing climate. The Global Conference on the Sustainable Development of Small Island Developing States, held in Barbados in 1994, was the first global conference on sustainable development and the implementation of Agenda 21 (Small Island Developing States Network, 1994). SIDS quickly acknowledged their disproportionate vulnerability to climate change and sea level rise, especially considering that they contribute minimally to climate change. The early 1994 SIDS statements stressed the justice dimension, namely the idea of ecological debt that demands compensation for past injustice damage and ongoing responsibility for climate change.

The vulnerability of small island developing states arises from the interplay of several factors: their location, topography, physical and political size, and geographic dispersion; their strong reliance on the world economy; and their limited resilience to natural disasters. SIDS represent approximatively 5% of the world population, and are a United Nations designated group covering 52 small countries and territories clustered into two main areas: 23 in the Caribbean and 20 in the Pacific (Kelman, 2010). The others are scattered across Africa, Indian Ocean, Mediterranean and South China Sea. They are mainly, but not exclusively, islands (Everest-Phillips, 2014). SIDS share some similarities; the populations are usually small, isolated, and dependent on natural resource-based livelihoods and /or tourism, with a strong ocean base. Land areas available and land-based natural resources are usually relatively small, while ocean-based livelihoods are usually relatively important (Kelman, 2010). Economically, they have limited markets and they depend greatly on external and remote ones for export. They also have to pay high costs for energy, infrastructure, transport, and communications (Everest-Phillips, 2014). SIDS are strongly dependant on the international economy. On the one hand, the high cost of doing business engendered by expensive infrastructure development and high communication, energy and transportation costs may discourage investors. On the other hand, small domestic markets limit import-substituting industrialisation. Consequently, SIDS usually privilege open trade regimes and are well-integrated into the world economy (Everest-Phillips, 2014). Regional trade organizations serve as an economic lever. For example, some regional

organizations in the Caribbean facilitate economic integration and cooperation, namely the *Association of Caribbean States* (ACS), the *Organization of Eastern Caribbean States* (OECS), and the *Caribbean Community* (CARICOM). These organizations also pay special attention to climate change impact, and devote a high percentage of their efforts in developing and promoting mitigation and adaptation programs.

A first significant injustice arises in that SIDS contribute relatively little to climate change, but suffer disproportionate consequences from the changing climate (Kelman, 2010). Recent Caribbean Community reports suggest that the rising sea level, amplification in the frequency and intensity of tropical storms and hurricanes, and disruptions in rainfall and fresh-water supply threaten the SIDS (CCCCC, 2015). According to the Inter-Governmental Panel on Climate Change (IPCC), the countries of the Caribbean are among the most susceptible to the likely impacts of climate change (Nurse, 2014). Particularly important for the Caribbean is the prospect of accelerated sea level rise, leading to shoreline erosion, inundation of low lying areas, higher water tables, salt water intrusion and property loss to near shore development. For instance, the IPCC projects sea level rise by the year 2100 to be 65 cm in the Caribbean, with an uncertainty range from 30 to 110 cm (Nurse, 2014). Moreover, records from coastal surveys conducted by the Sea Grant College Program based at the University of Puerto Rico show that the region has a background coastal erosion rate of 0.3m/year (London, 2007). Freshwater resources rank very high on the priority list of small island developing states, given the sensitivity and vulnerability to extremes of climatic behavior (Cashman et al., 2009). Concerns over the status of freshwater availability in the Caribbean region and in particular the eastern Caribbean states have been expressed for at least the past 30 years. A great part of the Caribbean Islands (Antigua and Barbuda, Barbados, Dominica, Jamaica, Saint-Lucia, Saint-Vincent and the Grenadines and Trinidad and Tobago) are ranked as the top countries facing water stress in the world (United Nations Environment Programme (UNEP), 2008). As a core issue, water justice in the Caribbean will be discussed in greater detail in the following chapter. Besides, some local practices have been identified as potentially contributing to observed flood increases and to future inundation potential. In the Caribbean region, these local practices are often associated with the rapid development for tourism purposes and mismanagement of agricultural land, which has created unprecedented pressure on the resources in the region (especially water). Rajack and Barhate (2004) highlight the struggle of many planning authorities to manage the pressure for land use changes in response to urbanization in many territories of the region, including Trinidad, Jamaica, Antigua and Barbuda and the Bahamas (Rajack & Barhate, 2004).

In responding to these disproportionate risks, SIDS unfortunately often lack technical and financial resources, especially in the resource management and planning sectors. Also, the technical support and knowledge are lacking to facilitate the education and participatory processes, key components of the sustainability framework. Kelman (2010) recounts frequent local requests: small-scale community-based processes to map out community plans; maintenance of local institutions that support climate change adaptation; and provision and updating of local-based scientific knowledge including climate projections and scenarios that community members can understand and apply (Kelman, 2010). In the Caribbean, this lack of resources is partially overcome by the Caribbean Community Climate Change Center (CCCCC), which functions as a key node for information and research and which coordinates regional responses to climate change (CCCCC, 2009a).

Second, climate justice challenges arise from governance issues. In some cases, local governance may be a concern. To illustrate this issue, Everest-Philips (2014) draws attention to the huge differences in development among small island states. For instance, Kiribati has one of the poorest per capita incomes while Brunei, Bahamas, Barbados, Malta, and Saint Kitts and Nevis have the highest per capita income. The Dominican Republic and Haiti share the island of Hispaniola and are broadly similar in geography and history (Everest-Phillips, 2014). However, their development trajectory has diverged remarkably. The countries had the same per capita real GDP in 1960 but by 2005 the Dominican Republic's per capita real GDP had tripled whereas that of Haiti had declined. This disparity confirms that politics, policies and local governance matter more than just size, geography or natural resources (Everest-Phillips, 2014). Moreover, multilevel governance in the climate policy making process is a major issue in the Caribbean, as detailed in chapter 3.

Third, climate justice challenges arise in the incapacity to voice local needs, concerns and priorities at the national, regional and international level. SIDS communities' large degree of marginalisation means that distant policy and decision power centres frequently do not consider them as priorities. This is even more problematic for non-sovereign islands, such as Montserrat and Guam, which must also overcome the large distances to their governing states (Kelman, 2010). Besides, SIDS often do not have the necessary resources to tackle all aspects of all topics in which they wish to be involved, especially in international negotiations. Particularly problematic is the lack of small-scale, local data. The IPCC projections serve as reference to support governmental decision in the Caribbean. However, IPCC projections are based on low resolution models which simulate changes applicable to a large region as a whole (approximately 300km by 300km) (CCCCC, 2009b). This scale does not distinguish climate response over smaller regions (e.g., the parishes of Jamaica). Therefore, technical resources are

necessary to downscale the results of these low resolution models to distinguish climate response over smaller regions.

Some intergovernmental organizations help to overcome this resources asymmetry. The *Alliance of Small Island States* (AOSIS) has been particularly effective in achieving many of its climate change goals on the international scene, demonstrating that SIDS can redress to some level the injustices of climate change (AOSIS, 2015). Also, *Small Island Voice*, an inter-regional initiatives focussing on SIDS and islands with other affiliations, has been quite active in supporting the voice of the general public on small islands through local projects and initiatives (Small Island Voices, 2015). The aims of these organizations are, for a large part, to support SIDS voices and local knowledge in distant and sometimes disconnected climate negotiations and target settings.

Last but not least, climate justice challenges often arise from the marginalization of SIDS claims in international negotiations. The current risks associated with the changing climate in the region are not necessarily acknowledged in the international agreements, as the region is already struggling to cope with present day climate variability. For instance, limiting the average global surface temperature increase of 2°C has been commonly regarded in science and especially in policy making as an adequate means to avoid dangerous climate change (Kelman, 2010). For the SIDS, this 2 °C increment would be catastrophic. SIDS have been campaigning vigorously to ensure global temperatures stabilize below this 2 degree increment. The recent Paris agreement ended up stipulating that all parties will pursue efforts to limit the temperature increase to 1.5 °C. Past and current international agreements raise many questions; what kind of threat qualifies as dangerous? What is the acceptable sea level rise? What global temperature increase is tolerable? What kind of danger is acceptable, and what kind of danger is acceptable for whom? As Sach (2008) states, these questions seem highly technical in appearance, but they are fundamentally political. And climate negotiations have not reached a consensus on defining what constitutes dangerous anthropogenic interference with the climate system (Sachs, 2008).

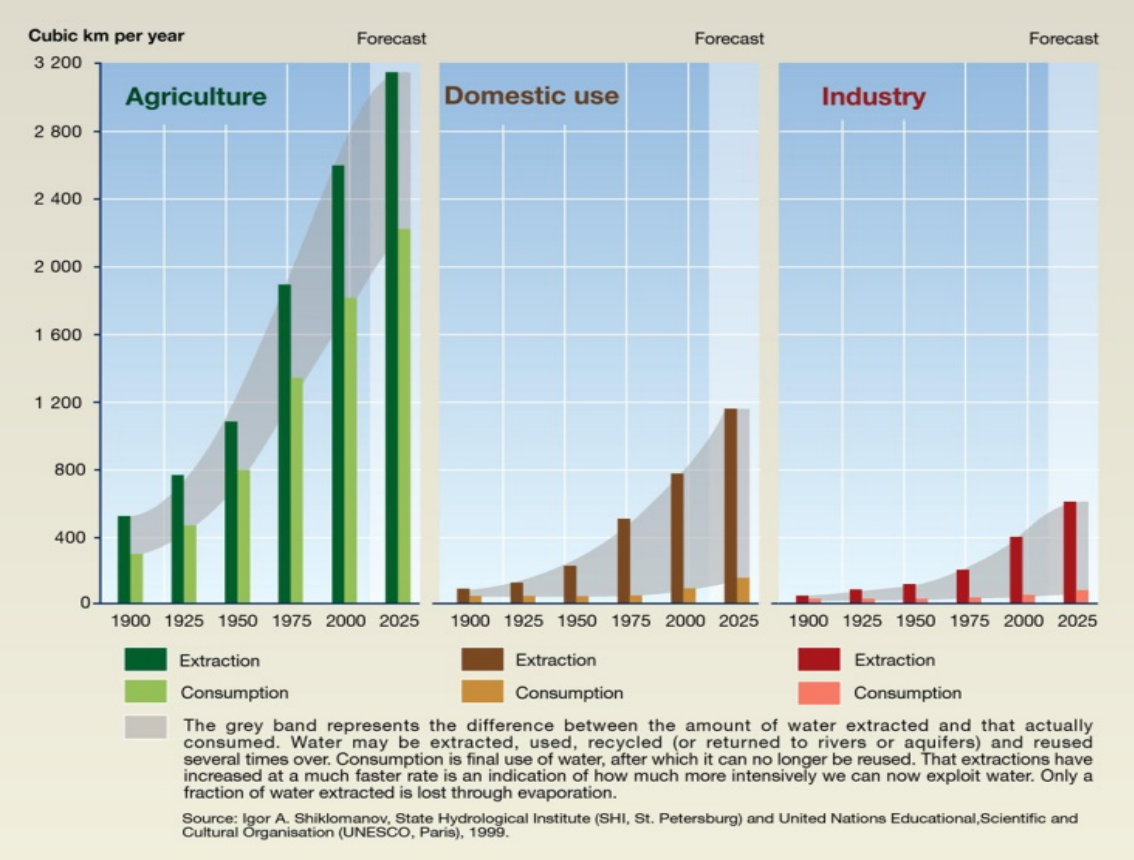
Water Justice

Water is a particular focus of attention within EJ and CJ. Water justice is an emerging concept, theory and model in the literature. Struggles over water access are struggles about environmental justice and sustainability. Water tends to embody the link between human needs and sustainability of resources, a link that is quite present in environmental justice debates (Agyeman, Bullard, & Evans, 2003). Given that the EJ movement originated in a battle against

water pollution that disproportionately affected people of color, it is not surprising that water justice became connected with both EJ and CJ concepts.

Since the 1990s, the scientific community has been warning about the rapidly changing climate and its impact on water supply for human communities. Multiple warnings have been ignored until very recently, and the issue appears now as a priority for most international organizations (United Nations Environment Programme (UNEP), 2008). The IPCC has stated that in the 2000-2005 period, climate change accelerated faster than predicted in the northern hemisphere, which means that the water cycle might change in an unpredictable way, leading to the possibility of increases in extreme weather (United Nations Environment Programme (UNEP), 2008). Concerns relate to the fact that even if water quantity does not change, the level of accessibility to available (drinking) water will significantly change. Besides, the exponential pace of industrialization combined with rapid urbanization patterns resulting from the globalized economy have contributed to exacerbated climate change impacts on water access and availability. In fact, intensive agriculture is by far the most demanding sector for water consumption. Agriculture accounts for 70 percent of the total water withdrawals of the globe, a percentage that is close to 85 percent when considering only the developing countries (Garces-Restrepo, Vermillion, & Muñoz, 2007). Figure 1 shows past and projected global water use in agriculture, industry and domestic use.

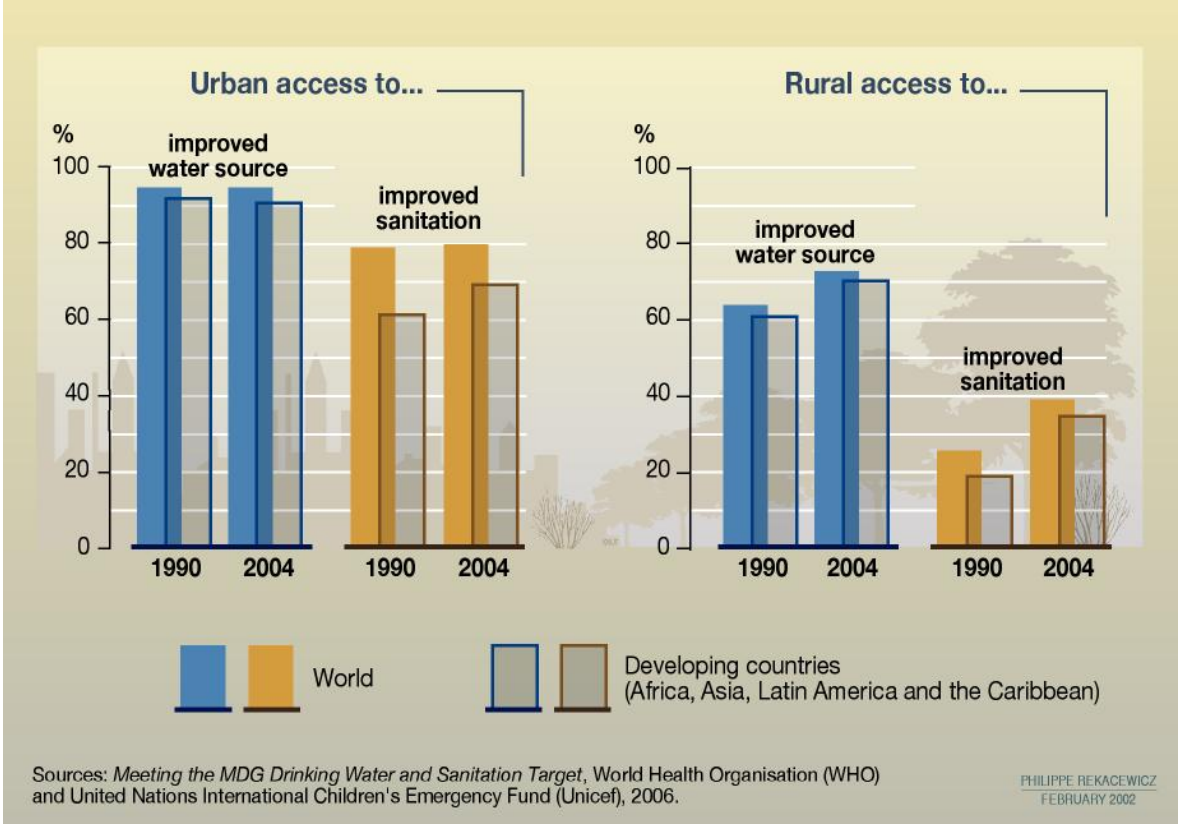
Figure 1. Trends in Global Water Use by Sector



Source: (United Nations Environment Programme (UNEP), 2008)

Access to safe water has become a global climate justice issue of primary concern, especially with the projected 60% of the world population living in urban areas by 2030 (Mehta et al., 2014). Yet, as urbanization patterns and urban interface are rapidly growing especially in developing countries, water accessibility and availibility, basic services and sanitation have become unprecedent challenges (Mehta et al., 2014). Figure 2 shows access to clean water and sanitation, with stark contrast between shortfalls of sanitation access and severe lack in urban areas in developing countries.

Figure 2. Inequality in Access to Clean Water and Sanitation



Source: (United Nations Environment Programme (UNEP), 2008)

Access to water in climate change context has raised variety of questions, such as how processes of rapid urbanisation serve to shape responsibilities, rights and the ability to participate in making climate change decisions (Bulkeley et al., 2013; Middelbeek et al., 2014; Zeitoun et al., 2014) argue that complex realities in the Global South increase challenges to realising rights and environmental justice, especially regarding water access. These complex realities relate to the contradictory nature of the state and its disregard for marginalised people, unequal experiences of citizenship in the periphery, elite biases in policy making and planning, resource capture by powerful players as well as significant distributional, recognition and procedural problems (Mehta et al., 2014). For instance, the authors highlight that slum dwellers may not trust the public water system because of drastic changes in water quality over time. While rich and middle class can turn to private water suppliers and technologies to cope with poor water quality (such as reverse osmosis), the urban poor have to live with poor water-quality (Mehta et al., 2014).

Access to water generates fundamental justice issues, especially in terms of gender equity. Women and children carry more than 70 percent of the burden in drinking water collection (Perret, 2006). This is especially troubling for girls, who are sometimes denied their right to an education since they spend a significant portion of the day searching for and collecting water (Perret, 2006). Literature has largely proven that climate change exacerbates water crises. Weather in rural, urban fringe or urban contexts, women remain the most affected by these crises (Faiz Rashid, 2000; Perret, 2006; Shiva, 2010).

In the EJ literature, an important gap is often highlighted regarding environmental justice dimensions in policy-making processes: the disregard of the underlying conditions of vulnerability, namely inequalities and marginality that are engendered and maintained in a particular world system (Kelman, 2010; Mehta et al., 2014; Zeitoun et al., 2014). The concerns emerge mostly from the political ecology analysis of water justice, which focuses on the political question of who has access to safe drinking water (or not) and how this access is managed. When assessing decision making processes in the water management sector, these questions become deeply political and contested (Zeitoun et al., 2014).

So far, we have seen that EJ concerns were first rooted in activism that associated the prevalence of negative environmental externalities with race, class and gender. EJ concerns grew globally as negative externalities followed the path of industrialization around the globe. With the multi-faceted nature of current and potential impacts, climate change has now become the most complex global environmental issue today. Major environmental justice and equity issues facing the climate change debate relate to distribution of impacts, distribution of responsibility and distribution of costs and benefits. Climate justice has ever since become a policy and scholarly topic that encompasses social, inter and intragenerational, race, and gender equity. We have explored that environmental justice paradigms may be framed differently in Global South. As SIDS are disproportionately affected by the changing climate, justice dimensions in policy-making are even more relevant to explore.

The Caribbean is one of the world region most affected by climate variability. Besides fighting for international representation, most Caribbean countries lack local resources to cope with potential climate change impacts. The literature on climate change in the Caribbean has exhaustively documented current environmental vulnerability and potential impacts of climate change in the region. Surprisingly, CJ in climate policy making has not been well investigated. The present SRP aims to contribute in this regards; and shed light on the way regional and national agendas are set to address climate vulnerability. As Popke et al. (2014) brilliantly suggest, “Using a lens of climate justice […] can call attention to the social and economic

inequities that hinder strategies of climate change adaptation, and can also point the way toward a more inclusive climate change policy in the Caribbean" (Popke, Curtis, & Gamble, 2014, p. 2). Besides, the analysis could build on environmental planning input. CJ in policy making is a critical topic of interest for planners. The concept is certainly about to become an integral element of sustainable development framework and practice. The next chapter outlines methods, concepts and benchmarks to assess climate policy through the lens of CJ.

CHAPTER 2: METHODOLOGY

The present SRP project constitutes a policy analysis of the water sector in Jamaica, now being developed through a sustainability framework. It explores how the policy engages, promotes and articulates justice in regards to water management. The research privileges a qualitative approach. Data were gathered from multiple sources, including academic projects, scientific articles, policy documents, government statistics, international and regional organizations reports, documentaries, books, and newspaper articles. In particular, resources from the Caribbean Community Climate Change Center were accessed. Finally, an informal discussion occurred in February 2016 with two master's student in Bioresource Engineering who have extensive work experience in the water sector in Jamaica. The discussion helped identify major water management issues as well as the role of regional organizations and local government agencies in the water sector.

How to assess Climate Justice dimensions in plans and policy? The methodology section answers this question by presenting a critical review of policy evaluation and plans when examining climate-related policy. It identifies practices, concepts and frameworks to analyse CJ in the Jamaica water policy sector. The present review focuses primarily sustainability frameworks, complexity science and moral philosophy as a mean to evaluate justice dimensions in both global climate policies and water management practices.

How to Assess Sustainability in Plans and Policies

Sustainability, and particularly sustainable development, is one core concept when looking at environmental policy development and plan evaluation. It involves many justice dimensions, although generally defined in terms of intergenerational equity. Although there is no consensus regarding the term's meaning, discussions of "sustainability" have made it clear that in the southern countries, the term has been conceptualized to include the necessary balance between environmental protection and anti-poverty measures, the need for economic growth, and the need for more democracy and justice in north-south relations (Jácome, 2006). In policy-making, sustainable development is often described as a symbolic rhetoric, a buzzword which has a malleable definition that fits ones' political agenda rather than serving as a conceptual framework for policy development (Berke & Conroy, 2000). As a result, the word "sustainable" has been overused in multiple fields, and has lost significance. The *xkcd* website embodies this phenomenon in an ironic graph called "The Word "Sustainable" is Unsustainable", showing the increasing use of the word sustainable in US English texts as a percentage of all words, per year, from 1950 to 2140 (Appendix, Figure A).

Sustainable development in planning introduces the important dimension of justice; attention is directed to how "development" should occur. **Public Participation** is noted as a key component of sustainable agendas (Berke & Conroy, 2000; Conroy & Berke, 2004). In the planning process, participation, especially local participation, is assumed to be a critical part of the paradigm shift towards planning for sustainable development (Conroy & Berke, 2004). **Community vision** is also highlighted as crucial in sustainable plans, as it reflects a shared vision emerging from participation, debate and dispute resolution. Good collaboration between all levels of planning entities is also highly important to consider when achieving sustainable development goals. Berke & Conroy specifically address how to evaluate sustainability in plans, and their work is used a basis for the methodology adopted in this SRP.

Conroy & Berke (2004) suggest a set of indicators to help in evaluating sustainability in local planning processes and local plans. Three dimensions, namely the **local planning process**, the **integration of the sustainable development as an organizing concept** of the plan, and the presence of **state planning mandate**, combined with an assessment of the local context, provide the foundation of their analysis. The first indicator, **local planning process**, starts with how sustainable development is being supported by the local community. Political shifts towards sustainability take time, and require adaptation process through adjustments, conflicts, and reorganization of internal governance and practices. Local commitment to sustainability goals and actions implies that sustainable development works as an organizing concept in the planning process (Conroy & Berke, 2004, p. 1387). Conroy & Berke (2004) argue that particular attention should be paid to how sustainable development may or may not be politically "charged", as it may affect community actions. Examining the local planning process directly entails looking at how public participation is being supported. It leads directly to justice issues; is public participation involving a diversity of stakeholders? Is an equal opportunity offered to each member of the community to participate at every stage of the policy making process? Is there imbalance of power between opposing groups? How well are plans and its outcomes representative of the community? Additionally to the work of Conroy & Berke, the eight rungs on a Ladder of Citizen participation proposed by Arnstein (1969) can help assessing the degree of citizen participation in policy assessment (Arnstein, 1969).

Human and financial resources are obviously an important dimension in planning for sustainable development. Many authors argue that low accomplishment is in a large part caused by inadequate resources (Berke & Conroy, 2000; Conroy & Berke, 2004; Turnhout, Hisschemöller, & Eijsackers, 2007). Berke and Conroy (2000) note that local capacity building plays a crucial role in introduction, adoption and implementation of any planning-related effort towards sustainable development (Berke & Conroy, 2000). Resources include technical skills,

funding sources, expertise and data as basis for plan development. Resources, as well as the number of years dedicated to the process, increase attention to sustainability issues.

The second indicator relates to **how sustainable development is being integrated as an organizing concept**: "Communities integrating the concept [sustainable development] in their plans demonstrate both an awareness of the concept and an explicit acknowledgement of it as the goal for their community's future"(Conroy & Berke, 2004, p. 1387). The plan reflects the will of the community to become a sustainable community, and "integration of concept of sustainable development in the plan […] is expected to produce positive support from sustainable development by plan policies" (Conroy & Berke, 2004, p. 1387). The comprehensive plan becomes an agent of change for the community to realize its vision. Political and community support is fundamental to translate local interests and needs into specific plans and strategies (Conroy & Berke, 2004).

The third indicator of sustainable development in plans refers to the presence of a **state planning mandate**. A State mandate should serve as a catalyst in sustainability promotion at the municipal level by providing information and financial support for the planning process, while giving new powers, control and influence at the local level, particularly on the environmental aspect of sustainability: "Mandate language also can specify local plan content and attention dedicated to specific plan elements through minimum standards that affect principles of sustainability. As a result of standards and resources, mandates can guarantee that sustainability-related policies are placed on the local political agenda"(Conroy & Berke, 2004, p. 1387). Conroy & Berke's (2004) policy evaluation requires that the three above mentioned indicators be combined in an exhaustive assessment of the local context. The inter-linked social, economic and physical development conditions are examined to inform how and why sustainable development in plans is being supported or not.

Some factors of success highlighted by Conroy and Berke (2004) suggest the importance of the adoption of state planning mandates with an explicit goal of promoting sustainability; such mandates support planning for sustainable development at the local level. In addition, a genuine local commitment to a sustainable future is a critical factor of success. This commitment is promoted by active public participation. Participation of a variety of stakeholders is highly advocated by the authors. In that sense, planners have a great role to play as facilitators of the participation process. To work properly, participants must be confident that their suggestions and decisions will be heard and acted upon. The authors finally note the importance of continued education of planning students on how to translate sustainability ideas into practice. Often, sustainability in plans is narrowly conceived in mainstream planning in

terms of built environment and physical factors to improve livability. Conroy & Berke's (2004) methodology, even though based on the US policy-making context, provides transferrable insights for assessing policy making in Caribbean contexts. The proposed descriptive assessment helps evaluate the substantive aspects of the plans. However, it does not provide much insight on how to evaluate procedural dimensions. In other word, the framework does not provide means for assessing how justice can be guaranteed through open and inclusive processes, and how these processes can be subject to democratic accountability. This constitutes a limitation. Therefore, other approaches would be needed for an extensive policy analysis, which are not explored in this SRP.

We have briefly explored the sustainability framework and ways to assess sustainable development in policy making. Operationalizing sustainability is an incredibly complex enterprise; not only does it require changes in existing government structures and peoples' mindset, but also an epistemological shift. In other words, it involves a shift in the nature of ecological knowledge and in how we acquire knowledge of nature. Complexity science, an emerging approach to science, can help in such enterprise.

How to Assess Justice in Governance Frameworks

> "The complexity of the government developing the policy should match the complexity of the system that will be affected by the policy." (Ho, 2012, p. 4)

Some scholars have focussed on 'adaptive governance' to describe how systems self-organize around the agency and adaptive capacity of climate change's potential victims. Peter Ho looks at how governments can be better prepared to deal with increasing complexity (Ho, 2012). Complexity science is the study of complex systems. This emerging approach to science is getting increasing attention, particularly in international development discourses (Everest-Phillips, 2014). As opposed to complicated systems (a predictable engineering system or machine), complex systems will not necessarily behave in a repeatable and predetermined manner; "components of a complex system interact in ways that defy a deterministic, linear analysis" (Ho, 2012, p. 2) . For example, the human body is a complex system, and so are cities. Complexity gives rise to what Rittel and Webber (1973) call "wicked problems"(Rittel & Webber, 1973, p. 160). Wicked problems have neither immediate nor obvious answers. They are all-embracing issues. They are highly complex problems because they contain many agents interacting with each other in often puzzling ways (Rittel & Webber, 1973). Climate change is a wicked problem at a global level, and so is water scarcity in the Caribbean.

Adaptive governance emphasizes complex ecological knowledge, continuous monitoring, flexibility and dynamic learning, the acceptance of uncertainty and surprise (Popke et al., 2014). Institutionalizing complexity can make government officials and policy makers more aware of subtle (often disregarded) sources of injustice coming forward. Ho (2012) explores elements and issues that foster (and deter) complexity through government structures. His major points are summarized below.

- **Government structure**: Complexity has to be fully acknowledged as a valid approach among government officials prior to any organizational changes. First, existing structures should be better organised to deal with unexpected events, what Peter Ho calls the "unknown unknowns", and the wicked problems that complexity generates (Ho, 2012, p. 5). The author warns against any attempt to create new departments to deal with new wicked problems; these departments may result in waste of resources and ineffectiveness if they do not contain enough organisational complexity (Ho, 2012).
- **Collaboration and expertise**: A variety of knowledge (everyday knowledge, scientific knowledge, traditional knowledge, etc.) is needed to address wicked problems generated by climate change. Ho says cooperative mechanisms need to be set up to enable people both from within and outside government to come together and share their knowledge in order to discover potential solutions and strengthen collective actions (Ho, 2012, p. 3). A balance has to be kept between the stability of the formal vertical government structure, and larger and varied horizontal network of government and national resources (Ho, 2012, p. 6).
- **Hierarchy**: Complexity challenges hierarchies. Ho (2012) argues that governments operate in a fast paced, complex and changing world. Decision makers neither have the full expertise nor all the answers for all problems: "In a hierarchy, the leader at the top receives all the information and makes the decisions. But, under stress, hierarchies can be unresponsive – even dangerously dysfunctional – because there are in reality decision-making blocks at the top."(Ho, 2012, p. 6). Climate policy and risk management should adopt a more flexible decision-making approach that takes into consideration this phenomenon.
- **Flow of information**: Information should not be kept by a single department according to its speciality. Ho notes that good, basic knowledge should be held by every department so that each component of the larger organisation can respond to issues and challenges as they arise. The same principle should apply to access relevant data by the entire organization. Information should further circulate multilaterally between all government agencies and organization at all levels (local, national, regional, and international). This is particularly important for addressing climate change issues since they embrace social, environmental,

economic, political and cultural dimensions all at the same time. Fostering an environment that encourages spontaneous horizontal flow of information enhances the worldview of those in all departments; it increases the chances to detect connections hidden by complexity, as well as emergent challenges and opportunities (Ho, 2012).

- **Shared understanding of challenges**: Government agencies should have a good and shared understanding of national challenges, as well as underlying principles to guide responses (Ho, 2012, p. 7). Each agency should ensure that its own plans and policies are aligned with the national imperatives. More importantly, each agency should advance larger national interests, rather than departmental interests. However, departments often compete for funding, and this tendency may make them deviate from collaboration and national goals achievement.
- **Acknowledging uncertainty**: Governments often make big decisions and develop strategies and plans under conditions of incomplete information and uncertain outcomes (Ho, 2012, p. 8). Particularly in the Caribbean, where local governments lack resources for exhaustive data gathering, it is never possible to be fully prepared to confront uncertainty. A "learning by doing" adaptive management approach should be adopted; the approach values exploration and experimentation when confronted with complex phenomenon instead of depending only on the predictions of analytical models (Ho, 2012).

Adaptive management is a process that deals with problems in unpredictable, complex systems (Everest-Phillips, 2014). In that sense, adaptive management works in an iterative way; by making small changes, observing the results, and then adjusting (Everest-Phillips, 2014). In policy making, this approach contrast with traditional linear planning approach, especially in the development field (Everest-Phillips, 2014). Finally, Ho's arguments remind us how the policy making processes need to take into account complexity:

> When governments ignore the complexity of their operating environment, they are at risk of assuming that policies that succeeded in the past will continue to work well in the future. They will deal with wicked problems as if they are amenable to simple and deterministic policy prescriptions. The temptation to take this approach is understandable. It is easier, requires less resource, and may actually lead to positive outcomes – but only in the short term. However, government policies that do not take complexity into account can, and often do, lead to unintended consequences, with a real danger of national failure in the long run (Ho, 2012, p. 4).

The above quote suggests the importance of integrating coomplexity into governments operation to deal with wicked problems, particularly in regards to climate policy making.

In the Caribbean, local governments policy-making processes are often embedded in multilateral institutions' projects (CARICOM and the Caribbean Development Bank) and

bilateral donors' agendas (the World Bank), which adds another level of governance complexity. In this context, coordination is key in program implementation. The next section will explore ways to assess environmental justice rationales in policy making.

Concepts for Assessing Justice in Policy-Making

Moral philosophy helps inform methodologies to assess justice in policy-making and planning. The rationalisation of ethical judgements is usually based on two broad paradigms of moral philosophy: deontological (rights-based) and consequentialist (goal-based) paradigms. The **deontological paradigm** posits the priority of the right over the common good. At the centre of this paradigm lies a principle of justice, basic rights, duties, obligations, responsibilities, proper conduct and inherent natural rights of others. Deontological reasoning requires that a decision-maker takes actions which are good standing alone (Ikeme, 2003). Thus, deontological evaluations focus upon the morality of actions themselves, not upon the consequences. This paradigm is supported by the assumption that humans have a sphere of inalienable rights in which no one is allowed to interfere, irrespective of the consequences. Justice demands respects for these rights, or compensation for its infringement (Ikeme, 2003). As discussed above, we can assume that the paradigm guides most of the rights-based approach to environmental justice, common in Global North environmental justice discourses. The **Consequentialist paradigm** on the other hand acknowledges the priority of the good over rights. Thus, policies governing actions are judged solely in terms of their consequences and effect on the general good. If conflict arises between general good and individual or group rights, the general good is given priority. Consequentialist evaluations focus upon the outcomes rather than the morality of actions themselves(Ikeme, 2003).

EJ issues encompass dimensions of fairness or equity, distribution, procedure (Ikeme, 2003; Popke et al., 2014). **Distributive justice** refers to environmental outcomes, and considers the extent to which environmental assets, or conversely environmental risks or hazards, can be said to be distributed in an equitable manner (Popke et al., 2014). Applied to climate change, distributional justice concerns highlight the disproportionate share of climate change impact that fall on the world's poorest peoples in the most disadvantaged regions, and precisely those who are least able to cope with and recover from climate-related disruptions (Popke et al., 2014). **Procedural justice** refers to the processes that shape environmental outcomes, including the formation of public policy and legal frameworks. Procedural justice is concern with the extent to which those processes are open and inclusive, and subject to democratic accountability (Popke et al., 2014). Climate change directly questions procedural justice in the frameworks and institutions shaping climate change policy and action at both local and global

scales. Popke et al. (2014) also highlight justice dimensions in **recognition**, which questions to what extent all groups with a stake in environmental processes and outcomes are granted the status, legitimacy and respect to be able to adequately represent their interests and positions (Popke et al., 2014).

The conceptual framework of Ikeme (2003) helps to better understand the ethical standpoint from which the North and the South conceive justice in international climate politics. The Global South has focused on rights and distributive injustice for historical emissions (Ikeme, 2003). The notion of growth, or the "right to develop" privileged in emerging economies, is seen as a valid right on its own, necessary for both economic equalization between states, and to achieve the country's objectives of meeting the basic needs of its citizens (Joshi, 2014). It reflects a deontological conception of EJ. The North, which Agarwal et al., (2002) broadly identify as the second camp, focuses mainly on consequentialist conception of environmental justice, with the aim of finding the most economically and ecologically efficient path for minimising climate impacts. In that sense, rightness of actions must be evaluated solely on the basis of their present and future consequences. Little emphasis is placed on the historic distributive inequities and constraints it now poses for the developing countries' "right to grow" (Ikeme, 2003). Ikeme's model explains the political tension and the intolerance expressed by each "camps" of nation in international negotiations. Concepts highlighted above help in understanding the ethical standpoint from which SIDS in the Caribbean conceive environmental justice.

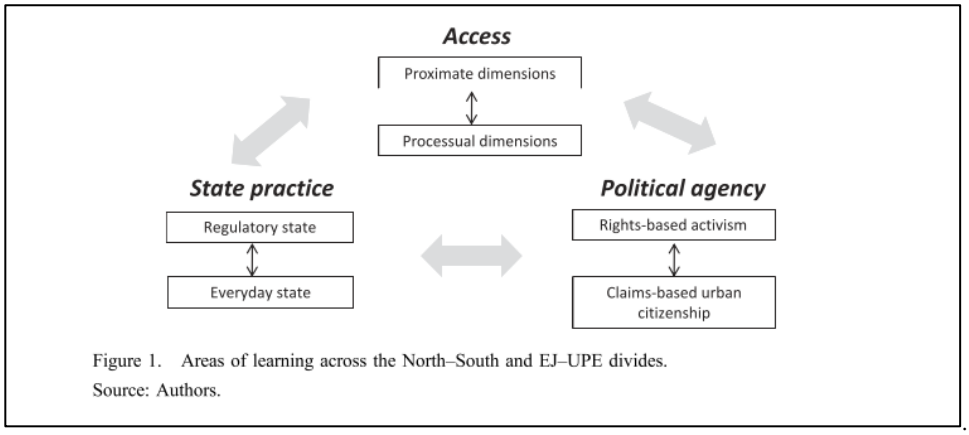
Environmental Justice Dimensions in Water Marginalization Contexts

To enrich global EJ discourse, Ranganathan and Balazs (2015) amalgamate two geographic literatures; Environmental Justice (EJ) present in the Global North literature, and urban political ecology (UPE), as present in the Global South literature (Ranganathan & Balazs, 2015). Ranganathan and Balazs (2015) emphasize an important gap to be filled in analysing political ecology and urban health, arguing that both paradigms should inform each other to deepen the concept of water justice. Their epistemological stance towards current western understanding of water marginalization in developing countries is reflected in the following quote:

> The fact remains that drinking water marginalization is still very much conceived of as a "Third World" problem. It is a topic approached through a colonial mind-set and the baggage of developmentalist stereotypes. Legions of undergraduates across North America will learn the story this way (Ranganathan & Balazs, 2015, p. 417).

Ranganathan and Balazs (2015) propose critical cross-national reflection on water marginalization that combines two forms of theorization. The authors juxtapose two case studies of water marginalization in the fringe of urban spaces in India and in the US. They look at three dimensions: water access, state practice and political agency. The authors note a strong tendency to define water access in the Global North in terms "**proximate"** dimensions, such as infrastructure supply, and the quality and quantity of water at the point of use. This tendency is embedded into a history of institutionalization of water standards mostly led by health practitioners and engineers in the field public health. The preoccupation with health and water is consistent with the origins of the environmental justice movement in North America (Ranganathan & Balazs, 2015). Conversely Global EJ and UPE framings predominant in the Global South have been more oriented toward "**processual"** definitions of access, particularly historico-political specific power relations that enable people to acquire benefit from water (Ranganathan & Balazs, 2015). In both cases, underemphasizing proximate or processual dimensions when analyzing water access impedes seeing critical links between human health and environmental health. Moreover, Ranganathan and Balazs (2015) note that EJ discourses can be enriched by juxtaposing sets of state practice typically associated either with the North or the South (Ranganathan & Balazs, 2015). The vocabulary of informality and its reproduction by the "**everyday state**" can inform EJ theorization of the Global North. "Everyday state" is brought to light through daily, messy negotiations between citizens and the state in which the boundaries between the two become blurred (Ranganathan & Balazs, 2015). Likewise, the "**regulatory state"**, fairly present in health-oriented and global EJ literature, can be used to understand how health risks and opportunities are negotiated in the South (Ranganathan & Balazs, 2015). Finally, the authors argue for a combination of political agency that, again, tends to typically emerge either from North or South contexts. While "rights-based activism" leads water justice struggles more frequently in the North, with a more "proximate" reading of access and a "regulatory" reading of the state, "claims-based citizenship" prevails in global South, with a more "processual" reading of access and an "everyday" version of the state (Ranganathan & Balazs, 2015). Here, "**rights**" is defined as part of the law, both formally and effectively, although they are not necessarily. "**Claims**" are demands for certain assets (water and shelter) typically made in the apparent absence of any legally enforceable rights. The following figure, retrieved from Ranganathan and Balazs (2015), depicts the link between the political ecology and the urban health paradigms according to the three EJ dimensions discussed above. It helps to visualize the interactions between the three dimensions outlined above.

Figure 3. Framework for a Cross-National Understanding of Environmental Justice



Source: (Ranganathan & Balazs, 2015, p. 406)

In sum, this section discussed approaches and models to assess sustainability frameworks in policies and plans; and explored core justice dimensions in sustainable development frameworks, namely public participation as a key component of sustainable agendas, financial and technical resources availability, and genuine national motivation towards sustainable development. Yet, we have seen that "the complexity of the government developing the policy should match the complexity of the system that will be affected by the policy"(Ho, 2012, p. 4). Addressing wicked problems generates opportunities to foresee potential sources of injustice. We conclude that environmental justice encompasses all kinds of justice, and that moral philosophy and social justice concepts help to grasp how the South and the North act on conceptions of equity and environmental justice in confronting the multidimensional nature of potential climate change impacts in international context. Both Global South and Global North EJ rationales should be combined for a better understanding of water justice at the local level. The above concepts and frameworks will be used in Chapters 3 and 4 to analyse regional and national Caribbean policy making process and outcomes.

CHAPTER 3: POLICY-MAKING ISSUES IN THE CARIBBEAN

Most Caribbean SIDS have been concerned with the status of freshwater availability for at least the past 30 years. Climate modeling for the Caribbean region under a range of scenarios suggests a continuation of rising average temperatures, a lengthening of seasonal dry periods, and increases in frequency of occurrence of drought conditions. Emerging concerns with respect to climate change include flooding, saltwater intrusion, and limited storage capacity, all contributing to increasing water scarcity (Cashman et al., 2009).

The SIDS have actively pursued strategies to increase their national income. Tourism has been a major economic driver. Most islands have sought development policies that promote large-scale resorts and other tourism infrastructure as a way of attracting more tourist-related revenue, which in turn, increases water demand (Cashman et al., 2009). Due to its economic importance, the tourism sector tends to be privileged over other consumers. Cashman et al. (2009) describe the paradoxical character of the situation: “The countries experiencing some of the highest rates of water scarcity are also some of the most attractive in terms of tourism, and therefore, experience the highest rates of increased demand for water” (Brown, Geoghegan, & Renard, 2007; Cashman et al., 2009, p. 44). Mismanagement in settlement patterns and agricultural land use practices have accelerated erosion and water runoff (Cashman et al., 2009). Moreover, the fragility of the agriculture sector, combined with potential climate impacts such as drought and flooding, seriously threaten agricultural productivity.

Water issues under climate change raise questions of resource management and land-use planning practices. Land-use patterns on SIDS follow, to a certain extent, worldwide observed urbanization patterns in low-income countries under globalization. A growing urbanization, an emergent middle-class population, and increasing migration towards urban areas are observed on many Caribbean SIDS (Cashman et al., 2009). However, with limited land available for an increasing number of uses and users, development has concentrated on environmentally sensitive areas such as coastal zones and hillsides (Cashman et al., 2009). These demographic patterns are having both a direct and indirect impact on water resources. They have increased demand for water and, alongside, raised problems associated with storm water management, urban runoff, waste management, pollution of groundwater, and the reliability of supply. Land development needed to accommodate tourism and urbanization patterns have exacerbated water scarcity in the region (London, 2007). Simultaneously, projected and current climate change impacts such as sea level rise, intensification of storm surge and flooding are threatening the most populated areas, and also the poorest share of the population (London, 2007).

Climate perturbations are likely to be superimposed on economic insecurity and poverty. Furthermore, the burden is expected to fall on the populations socially and geographically disadvantaged (Middelbeek et al., 2014). In the Caribbean, this is likely to include coastal populations, groups that are dependent upon fragile ecosystems (e.g. the fisher folk), and rural agricultural communities (Popke et al., 2014). As in most low-income countries, the richer households are more able to cope with the consequences of environmental impact, weather by purchasing technologies, accessing health services or, if necessary, moving themselves elsewhere (Mehta et al., 2014).

Climate change inevitably impacts human health (Sachs, 2008). Global warming accelerates the potential transmission of malaria and dengue, two vector borne diseases, each of which currently affects 40 to 50 % of the world population (Sachs, 2008). For instance in September 2014, a local Jamaican newspaper reported that Chikungunya outbreak in the Caribbean led to shortage of basic medication needed to address symptoms in many pharmacies. In Jamaica, the outbreak significantly increased student and teacher absenteeism and affected the entire education system (Caribbean360, 2014).

The growing concerns around the changing climate have shed light on a crucial justice dimension; the limited capacity to adapt and respond to climate change, especially in the water sector. This chapter addresses on current and past regional responses, identifies factors impeding environmental coordination, and explores regional patterns in the water reform policy.

Regional Responses to Climate Change

Most countries in the wider Caribbean region have sought to initiate policy and institutional efforts to mitigate the negative aspects of climate change. The region got involved early in international climate negotiation. Most CARICOM Member States have ratified the United Nations Framework Convention on Climate Change (UNFCCC), which is the main international treaty on climate change. Several Member States have also ratified the Kyoto Protocol (CCCCC, 2009a).

One early catalyzing event was the UN Global Conference on the Sustainable Development of Small Island Developing States, which took place in Barbados in 1994. The conference led to the ‘Barbados Programme of Action’, a 14-point program that laid out a number of specific sustainable development challenges faced by SIDS, including climate change and sea-level rise (Popke et al., 2014). The region very early emphasized the uneven consequences of climate change on the SIDS. Climate responses include applying principles of equity and sustainability

to assess and limit the negative impacts of climate change. The regional response has focussed little on the disproportionate causes and effects of climate change, and thus emphasized little on a fair process of climate change mitigation.

In the policy arena, adaptation has become a key focus for initiatives aimed at redressing the negative consequences of the changing climate (Popke et al., 2014). Applied in regional and local programs and frameworks, adaptation translates into policy via techniques of risk management and emergency response, with specific attention to the protection of property and infrastructure that may be vulnerable to hazards. In more general terms, adaptation has also led to increased monitoring (climate, sea-level rise, and flooding occurrences), enhanced scientific and technical competence, and review of planning processes and institutions to incorporate climate change concerns (Popke et al., 2014).

SIDS have implemented a range of national "enabling activities" and participated in a number of major regional projects designed to build institutional, national, and human capacities. The Caribbean Community Climate Change Center (CCCCC) opened in that context in 2005 (CCCCC, 2015). The center has many functions: it acts as a legal counsel for CARICOM, as a key node for information and research on climate change issues, and as a unit coordinating the regional responses to managing and adapting to climate change. It provides climate change-related policy advice and guidelines to the Caribbean Community (CARICOM) member states through the CARICOM Secretariat (CCCCC, 2009a).

The center has initiated numbers of projects, frameworks and guidelines. In 2009, the CCCCC released the *Climate Change and the Caribbean; Regional Framework for Achieving Development Resilient to Climate Change (2009-2015).* The document provided a roadmap for action through a number of programs to support mitigation and adaptation projects across the region. It has been based on the Mainstreaming Adaptation to Climate Change (MACC), a former project implemented by the World Bank in the early 2000 (CCCCC, 2015). The framework was formulated from the perspective of the CARICOM governments and their development partners, including the governments, the private sector, the civil society, the regional organisations, and the international community (CCCCC, 2009a). The Regional Framework is oriented around four main strategies that address vulnerability, adaptation and mitigation. It emphasizes a holistic climate agenda couched in the concept of resilience: ''The strategic vision that drives this regional framework is the achievement of a regional society and economy that is resilient to a changing climate"(CCCCC, 2009a, p. 10). As a coordinating unit, the CCCCC assumed lead responsibility for the framework, working in collaboration with national governments, the CARICOM Secretariat, regional institutions, civil society and

private sector entities, and mobilising financial and other resources required for its successful(CCCCC, 2009a).

Regional responses have undoubtedly focused on climate adaptation rather than mitigation. While mitigation is important, most countries in the Global South, including those of the Caribbean region, have tended to focus on the negative consequences, rather than the causes, of a changing climate (Popke et al., 2014).

Environmental Movements in the Caribbean

At the regional level, different EJ rationales guide environmental cooperation in the region. Environmental movements in the Caribbean are extremely heterogeneous for two main reasons: the variety of actors at the international, regional, national and local levels on the one hand, and different theoretical approaches to environmental problems, which translate into different political agendas of organizations playing a role in the region (Jácome, 2006).

The emergence of NGOs and government agencies in the 1950s first brought attention to environmental problems in the Caribbean. By the 1980s, NGOs started to be actively involved in environmental issues in the region (Jácome, 2006). Ever since, environmental movements have sharply grown, especially in the context of climate change. The main stakeholders involved in the climate change governance in the region are listed in the annex below (Appendix, Figure B). The list builds on many articles, governmental documents and the discussion on Jamaica held in February 2016 with master's students in bioresource engineering.

The fact that northern governments, NGOs, and international organizations are major donors for environmental initiatives and projects in the Caribbean raises some important questions: How does this relationship influence goals setting and project implementation at the regional and the local level? Is this financial support inducing a certain conception of justice in project implementation? A closer look at the structure of environmental cooperation provides a basis to think about these questions.

Overview: Organizational Structure of Environmental Cooperation

> "The idea of the Caribbean as a region is fundamental if we are to overcome the barriers imposed by localism, insularity, and sub-regiona1ization. These are barriers not only to environmental cooperation, but to regional cooperation in general."(Jácome, 2006, p. 29)

The complex organizational structure of environmental cooperation complicates water management issues. Jácome (2006) portrays the organizational structure of environmental cooperation in the Caribbean. She highlights that traditional vertical structures prevail in most government agencies. Decisions are made at the ministerial level, with directors of departments or divisions as the next level. The same structure prevails also in intergovernmental organizations, where decisions are made at meetings attended by representatives of the member states, and implementation is assigned to an executive director (Jácome, 2006). Most organizations and government agencies in the region have executive, administrative, technical, and consulting staffs. Research and academic staff is limited, but tend to increase in regional organizations with the variety of projects and programs involving Caribbean universities (namely the University of West Indies) for natural resource management (Jácome, 2006).

The heterogeneity of stakeholders' agendas renders environmental cooperation difficult. Jácome (2006) highlights that top-down cooperation (e.g., Regional governments to national governments, or World Bank to national governments) is generally provided in the form of technical assistance to implement conservationist policies (e.g., coastal erosion monitoring). In contrast, local NGOs usually privilege a political ecology-oriented cooperation approach (Jácome, 2006), such as *Fondes Amandes*, a Trinidad-based community reforestation project that focuses on socio-environmental issues and their connection with environmental degradation (TriniView.com, 2011).

In the Caribbean, the cooperation system has the tendency to discourage multilateral mediation. Jácome (2006) identifies major impediments to environmental cooperation at multiple levels of governance. First, she notes that regional and international organizations prefer bilateral relations with a single national actor. Besides, relations occur mainly between a local NGO and a regional one, between a regional inter-governmental organization and a national government, and between regional and international organizations. Intergovernmental organizations or regional NGOs have done little to foster multilateral relations among multiple local entities. Moreover, Jácome (2006) highlights that environmental cooperation is generally limited to financial or technical assistance from regional and international organizations to those working at the local level. Finally, most Caribbean governments privilege their relationships with international organizations. As a result, we typically find an absence of

mechanisms for cooperation among NGOs within a single country. Sometimes, governments have no contact at all with NGOs in their own countries. Since local NGOs are particularly aware of local struggles and community concerns, a lack of cooperation mechanisms may decrease chances to detect connections hidden by complexity, emergent challenges, and opportunities at the local level. In addition, the absence of cooperation mechanisms hinders the flow of information between multilevel stakeholders. As Peter Ho argued, mechanisms ensuring flow of information are crucial for addressing climate change issues since they embrace social, environmental, economic, political and cultural dimensions all at the same time. Fostering an environment that encourages spontaneous horizontal flow of information enhances the worldview of all stakeholders involved (Ho, 2012).

Water Management Issues in the Caribbean

> What is unique about the recent round of water supply privatization is the global scale of capital interests acquiring water supply networks both in the global North and South […] But simply because of its unique biophysical nature and the multiple values that societies attach to it, not to mention its obvious life-sustaining qualities, water is proving to be the slipperiest of customers for neoliberalism […] the experience of water privatization is creating spaces for the most intense and bitter contestation of neoliberalism's triumphant diffusion under globalization (Mustafa & Reeder, 2009, p. 790).

Water forms an important aspect of the sustainable development framework. Recent reforms have taken the form of: Integrated Water Resource Management (IWRM) policies at the river basin level; institutional decentralization (catchment management agencies or water users associations); and Irrigation Management Transfer (IMT) in the agriculture sector (Perret, 2006). IMT refers to "the process that seeks the relocation of responsibility and authority from the controlling government agencies managing irrigation systems (under the public sector) into the hands of non-governmental organizations (NGOs) or other private-sector entities" (Garces-Restrepo et al., 2007, p. 4).

Traditionally, the water domain has been dominated by top-down and closed decision making processes. Concerns of the population, especially marginalised and disenfranchised citizens were often not taken seriously (Mehta et al., 2014). IWRM, as part of the sustainability model, has paid particular attention to public participation as a key component of water management. As the CCCCC regional framework policy illustrated above, many Caribbean countries shifted towards a sustainable development model as part of their national policy, with particular attention to the water sector. The recent 2015 *Climate Change Policy Framework for Jamaica*, and the 2011 *National Climate Change Policy* in Trinidad also demonstrate this shift at the national level. Again, the definition and implementation of sustainable development is a matter of interpretation.

Like other developing countries, water governance has transformed in the last decades. Increasing water demand, rapid urbanization patterns, diversified and unevenly distributed users, climate change, environmental and health concerns have led to in-depth reforms and new policies in the water sector (Perret, 2006).

Structural adjustment has been a driving force. As required by the international financing institutions, governments in many developing countries have formulated techniques to decrease public spending. Besides, the high debt burden of many of the countries in the region has, in some cases, led to decreased state investment in public services, such as water management and services (Cashman et al., 2009); Shrinking budgets have driven many governments to opt for privatization of their water management, especially in urban areas. In the 1990s, many activists and academics raised a "red flag" on the predominance of neoliberalism on the global scale and the systematic practice of commercialization and privatization of water supply systems, particularly in urban areas (Mulreany, Calikoglu, Ruiz, & Sapsin, 2006; Mustafa & Reeder, 2009). Challenges regarding water privatization in Latin America, and especially in the city of Cochabamba, Bolivia, are well documented (Mulreany et al., 2006).

From a political ecology standpoint, concerns about water supply privatization embody one of the major impacts of globalization on resource use. The act of commodifying water supply raises direct social justice issues, namely regarding fundamental right to have access to water. Mustafa & Reeder (2009) investigated how the population of Belize City, Belize, perceived the 2001 privatization of water supply to improve quality and service of water delivery. Privatization of water led to a subsequent governance change. Staffs reduced, as did maintenance. Water price went up: "The government privatized the company, the management changed. The company is trying to make back the money they bought the water utility for. They are holding the consumer at ransom. The government really messed up." Interview respondent B14, quote retrieved from (Mustafa & Reeder, 2009, p. 804). The main feeling of injustice experienced by the citizens revolved around perceived lack of improvement, worsening quality and accessibility, and decreasing affordability of water. Mustafa & Reeder (2009) report that the cost of water supply was "unreasonable" for most Belizeans (especially the poorest share of the population), and was a major factor in rising disconnection rates, thereby rendering the whole experience of the new water management undesirable at the societal level (Mustafa & Reeder, 2009, p. 805). The authors highlight that the privatization was partially an outcome of the pressure from multilateral donors. The names of the donors are, however, not mentioned in the article.

Another concern in the region is the local inability to cope with increasing occurrence of flooding in informal contexts. For instance, in Trinidad, many low-income and informal settlers live in the East West Corridor. The Corridor is a densely populated stretch of villages, suburbs and towns where housing plots, roads and public spaces are prone to flooding, especially during the rainy season. Floods remain the core climate threat, with vulnerability/exposure enhanced by land-use mismanagement and urbanization patterns, inadequate drainage system, poor maintenance, garbage dumping into waterways, and poor maintenance of river channels (Middelbeek et al., 2014). These communities are often unreached by government climate change actions. Middelbeek et al (2014) observe that low-income households in informal settlement function in isolation of government agencies in their adaptation responses. Local flooding responses include cleaning and maintaining the drains before and after floods, house fortification before and after the flood and cleaning up. The study shows that households recognize the limited capacity of the government to intervene at the community level (Middelbeek et al., 2014). The findings highlight weak cooperation between households and the institutions, which limits households' ability to benefit from the existing institutional framework for climate change adaptation. The study also reveals important institutional articulation challenges driven by a lack of coordination within the governance network on the one hand, and by the lack of effective communication leading to an inadequate sharing of climate change adaptation information among stakeholders. These challenges lead to underuse of institutional climate change adaptation capacities (Middelbeek et al., 2014).

In the Caribbean, resource management issues raise the question of the role of international financial organizations (IFIs), such as the World Bank, in shaping regional policies. Shiva (2008) draws particular attention to how IFI practices have shaped development trajectories in most developing countries. She argues that the imposition of the "mechanical-industrial paradigm" for production and distribution of food, clothing, and other basic needs in the south was initially carried out by the World Bank and the International Monatary Fund (IMF) through development aid (Shiva, 2008, p. 15). It is now imposed through World Bank/IMF structural ajustment programs (SAPs) and the WTO rules of free trade (Shiva, 2008, p. 15). The implementation of structural adjustment policies, concurrent with nationwide policies toward for free trade, has had consequences for economic policies, water management, land use and land development practices. In the Caribbean, these policies have led some local governments to generate foreign exchange by promoting export-led growth and increased commodity exports. Structural economic changes have led many islands, including Jamaica, to

boost their agricultural sector and adapt their irrigation strategy to increase crop productivity. Policies encouraging expansion of tourism have had a similar effect (Jácome, 2006).

This chapter highlighted key water issues for SIDS in the region. Increasing water demand, rapid urbanization patterns, diversified and unevenly distributed users, and environmental and health concerns have led to in-depth reforms and new policies to adapt to the changing climate. However, we have seen that major factors impede regional and national responses, namely the lack of multilateral cooperation and flow of information, the lack of financial and technical resources, and the lack of bottom-up mechanisms that connect the stakeholders at all level. We have finally explored how regional reforms are embedded in global patterns in the water management sector. The next chapter will explore climate justice dimensions in water policy making in Jamaica, one of the most water stress SIDS in the Caribbean.

CHAPTER 4: POLICY ANALYSIS IN THE WATER SECTOR IN JAMAICA

Major weather-related natural disasters have led the government of Jamaica to update and prepare a series of climate-related policies and frameworks over the last 10 years. The current update of the Water Sector Policy is part of this effort.

As is the case of most small Caribbean States, climate change has exacerbated shortages of water in Jamaica. Vulnerability to climate change impacts in the country is intensified by poverty, the location of human settlements in high risk areas, environmental degradation and instances of poorly constructed infrastructure and housing (CCCCC, 2009b). Unfortunately, despite the growing vulnerability in the region, climate justice dimensions are not adequately addressed in the current policies.

This section is an attempt to assess climate justice dimensions in the Jamaican Water Sector. It focuses on two main documents: The *Draft Water Sector Policy* and the *Jamaica Climate Change Framework*. The policy analysis does not aim to be exhaustive; it examines selected elements of each both policy. The assessment is based on key concepts and frameworks outlined in the methodology section, evaluating justice along three dimensions, according to these questions:

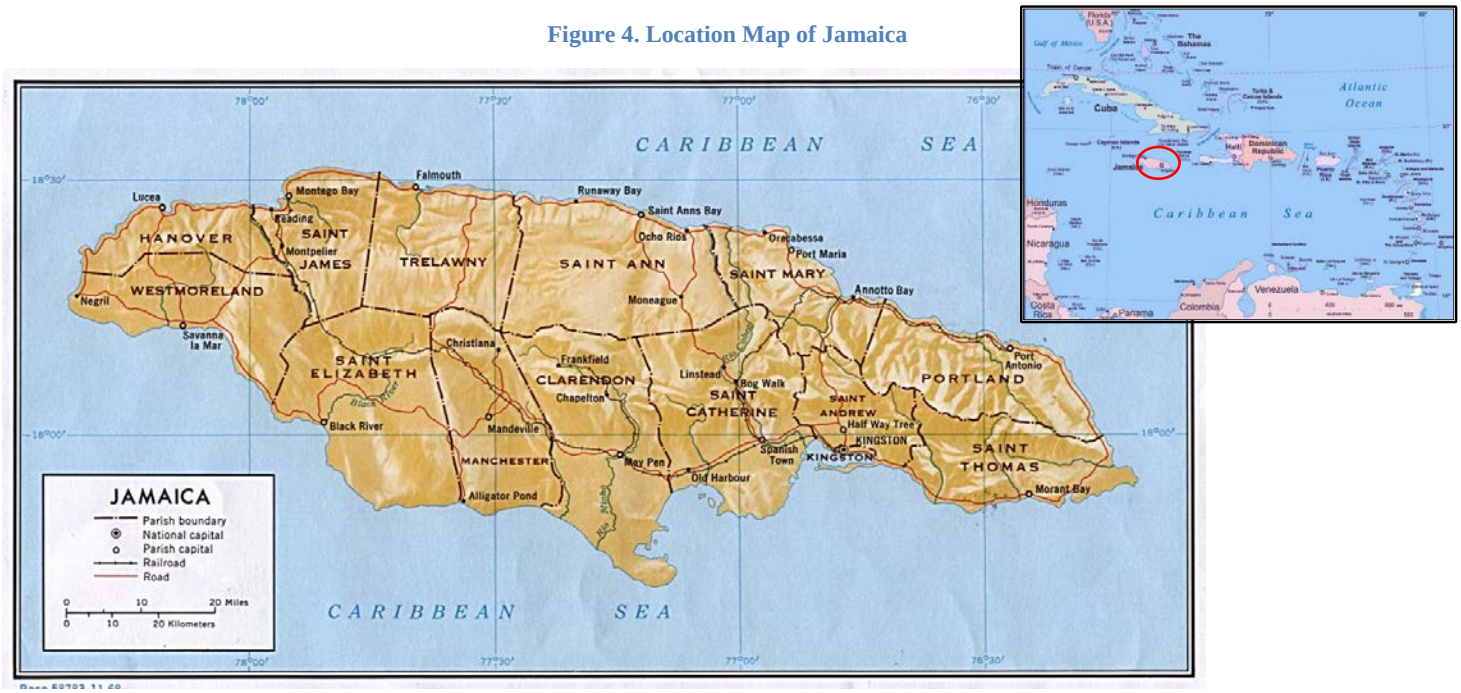
- What environmental justice paradigm informs the shift in the Jamaican policy-making process regarding water management?
- How is the sustainability model defined?
- How are the policies dealing with complexity?

The analysis provides good insights as to climate justice dimensions of Caribbean policy making, and raises important questions in terms of how justice will be operationalized to address current social, economic and environmental vulnerabilities.

Climate Change and Water Issues in Jamaica

Jamaica is a Caribbean SIDS located about 145 kilometres south of Cuba, and 191 kilometres west of Hispaniola (Haiti and Dominican Republic) in the Caribbean Sea. The island has a total area of 11,244 km2, and therefore, is the fourth-largest country in the Caribbean (CCCCC, 2009b).

Figure 4. Location Map of Jamaica



Source: (The University of Texas at Austin, 2016)

The physiography of the island is characterised by a series of hills and mountains. Based on their hydraulic properties, the geologic units of Jamaica are divided into either aquifers or aquicludes, which are underground layers of water-bearing permeable rock (CCCCC, 2009b). Given Jamaica's topography and geology, some parts of Jamaica are more prone to drought than others. This is the case for the parish of Saint Thomas and Saint Catherine (CCCCC, 2009b).

Between 1979 and 2007, Caribbean territories, including Jamaica, experienced severe economic and social disruption from several natural hazard events such as hurricanes and tropical storms, flood and drought. For instance, the 2012 Hurricane Sandy accounted for 48% of the total costs in damage in the health, housing and education sectors (Government of Jamaica, 2015). With addition, damage to crops, livestock and irrigation systems. This Hurricane and its aftermath was combined with an abnormally low level of rainfall, led to drought conditions during July to September 2012. These events forced the government to

acknowledge the vulnerability of the country and to review policy, particularly for the water sector.

Extensive studies and projects have been conducted to assess the current vulnerability of the region to climate change. According to the most recent climate models, the mean annual temperature for Jamaica is projected to increase between 1.1 ˚C and 3.2 ˚C by the end of the century (Government of Jamaica, 2015). Changes in temperature are expected to result in adverse shifts in climatic conditions for agricultural cultivation, availability of water during periods of prolonged droughts, and damage to infrastructure, mainly caused by extreme and slow onset events (Government of Jamaica, 2015). Likewise, the sea level is projected to rise between 0.18m to 0.59m by 2100 (Government of Jamaica, 2015), increasing coastal erosion, as well as the probability of saltwater intrusion and contamination of ground water resources (due to intrusion of sea water into coastal aquifers) (Planning Institute of Jamaica, 2009). The Jamaica Water Resource Authority projects that the sea level rise and land inundation could seriously impede water availability for the overall coastline population (including the resorts) because of saline water intrusion of coastal aquifers (CCCCC, 2009b). In the Kingston area, for example, many coastal wells have been abandoned due to poor water quality resulting from this phenomenon. Elsewhere in Jamaica, aquifers are experiencing the same kind of deterioration in quality (Planning Institute of Jamaica, 2009).

Jamaica's susceptibility to natural disasters is a major threat to the stability of human settlements and infrastructure. Approximately 82% of Jamaica's population lives along the 886 Kilometers coastline, or within 5km of the coast (CCCCC, 2009b). The coastline is also the location for most infrastructure, formal and informal housing, and economic activities, including tourism, mixed farming, fishing, shipping and mining (Government of Jamaica, 2015). Given the concentration of Jamaica's population in low laying coastal areas, coastal flooding risk has become a major concern. The impacts of flooding are exacerbated by poor physical planning, poor land use practices, poorly maintained infrastructure as well as a lack of understanding in the policy making process of flood generating processes and the associated risks (CCCCC, 2009b). Disproportionate risks fall directly on settlements that have been created outside the formal physical planning system, and which do not meet the required planning and building standards. Settlement also occurs in hazard prone solution basins and floodways which are often compromised in their ability to discharge floodwaters because of blocked sinkholes or heavily silted channels (Government of Jamaica, 2015). Besides, inadequate settlement patterns and land use practices have greatly altered the natural precipitation-runoff regimes, placing non-historically vulnerable areas at risk.

The coastline is characterized by resorts in areas such as Montego Bay, Ocho Rios, and Negril. Tourism remains one of the most important sectors to the nation's development and is directly connected to other sectors (e.g., water, farmers' markets and agriculture, fisheries and coastal resources) (CCCCC, 2009b). Potential impacts outlined in the *Climate Change Policy Framework* include: damage to tourism infrastructure and hotels in coastal areas susceptible to storm surge; coastal erosion and sea level rise; reduction in fresh water resources and food production arising from precipitation amounts and spatial distribution; and loss of beach areas (Government of Jamaica, 2015). The *Draft Water Policy Sector* observes that, while the hotel sector contributes significantly to GDP (24%), it represent a small proportion of the total water demand (CCCCC, 2009b). The agricultural sector, as discussed below, actually accounts for the bulk of the water demand.

Vulnerability of the Agriculture Sector

The fragility of the agriculture sector is a concern for Jamaica. Agriculture remains central to the economy, primarily for employment despite a decline in the number of persons involved, and foreign exchange generation (CCCCC, 2009b). The likely increase in climatic variability will destabilize the sector.

In Jamaica, half of the total area irrigated is publicly managed while the other half is on individual private plots and commercial estates. Irrigated agriculture accounts for approximately 25,214 ha (9.3% of cultivated lands), while representing around 85% of Jamaica's total water usage (excluding environmental needs) (CCCCC, 2009b). Most of the irrigated areas are located in the Parishes of Clarendon and Saint-Catherine. Moreover, 76% of all irrigated lands are under sugar cane production, followed by bananas, pastures, and vegetables production.

High water demand reflects low irrigation efficiencies attributable to the method of irrigation, mismanagement of the irrigation system, lack of maintenance and investment, and other factors. The high demand suggests also that sugar cane production is using a large share of available water. Outside of the irrigation system, many farmers with small holdings in most parishes irrigate vegetables or fruit trees using their domestic water supply or from local surface sources, springs or stored rainwater (CCCCC, 2009b).

Access to irrigation is key element in the context of increasing incidences of drought on the island. In recent years, the Government of Jamaica has been promoting agricultural productivity with the extension of the irrigation system and greenhouses (Popke et al., 2014). Part of the action was to cope with incidences of drought. Popke et al. (2014) note that the

recent government actions have advantaged some farmers over others, especially in drought periods. It has disadvantaged small farmers without access to irrigation, as traditional risk management strategies become more and more ineffective. When rainfall is scarce, for example, small farmers tend to rely upon a limited number of drought-tolerant crops (Popke et al., 2014). Consequently, it tends to drive up the price for water-hungry crops on the market, providing a significant opportunity for farmers with irrigation to make larger profits (Popke et al., 2014). This dynamic raises questions as to how it affects food insecurity on the island. Local newspaper reported recently that the impact of drought on coffee farming will be deeply felt because of the lack of irrigation systems in some areas. The past president of the Jamaica Coffee Growers' Association declared in 2015 that coffee farmers, especially in eastern Jamaica, can no longer rely on rainfall in the absence of irrigation (Johnson, 2015).

In short, the irrigated agriculture is key element in coping with climate variability: It can bolster food production and keep enterprises going. However, irrigation accounts for the bulk of water demand, while serving a small share of current cultivated lands. Important questions have to be raised: Who benefits from irrigation and who does not? And why? What underlying factors are impeding efficiency of the irrigation system (e.g., lack of regulation enforcement, pipe leaks)? And what are the impacts of the recent irrigation system extension on farmers with small holdings? These questions seem crucial to address in the national Water Sector Policy because they can highlight what maintains the vulnerability of the agricultural sector under conditions of climate variability.

Water Management

In Jamaica, a wide range of agencies are involved in the water sector. Many of them were set up under the 1999 National Water Policy, which enabled the provision of adequate water and sewerage services. The main objectives of the Policy revolved around universal access to water by 2010, improvement in the efficiency of the National Water Commission, and expansion of central sewerage facilities (Ministry of Water and Housing, 2004). The government emphasis was on universal access, since one in four Jamaicans does not have access to piped water but rely on standpipes. Most of these people are among the poorest 20 % of the population (Jamaica Observer, 2014b).

The role of the main water agencies is outlined in the following table, based on the *Draft Water Sector Policy*. The draft assesses the current state of the water sector and to make recommendations to align the new Water Sector Policy with other key national climate frameworks.

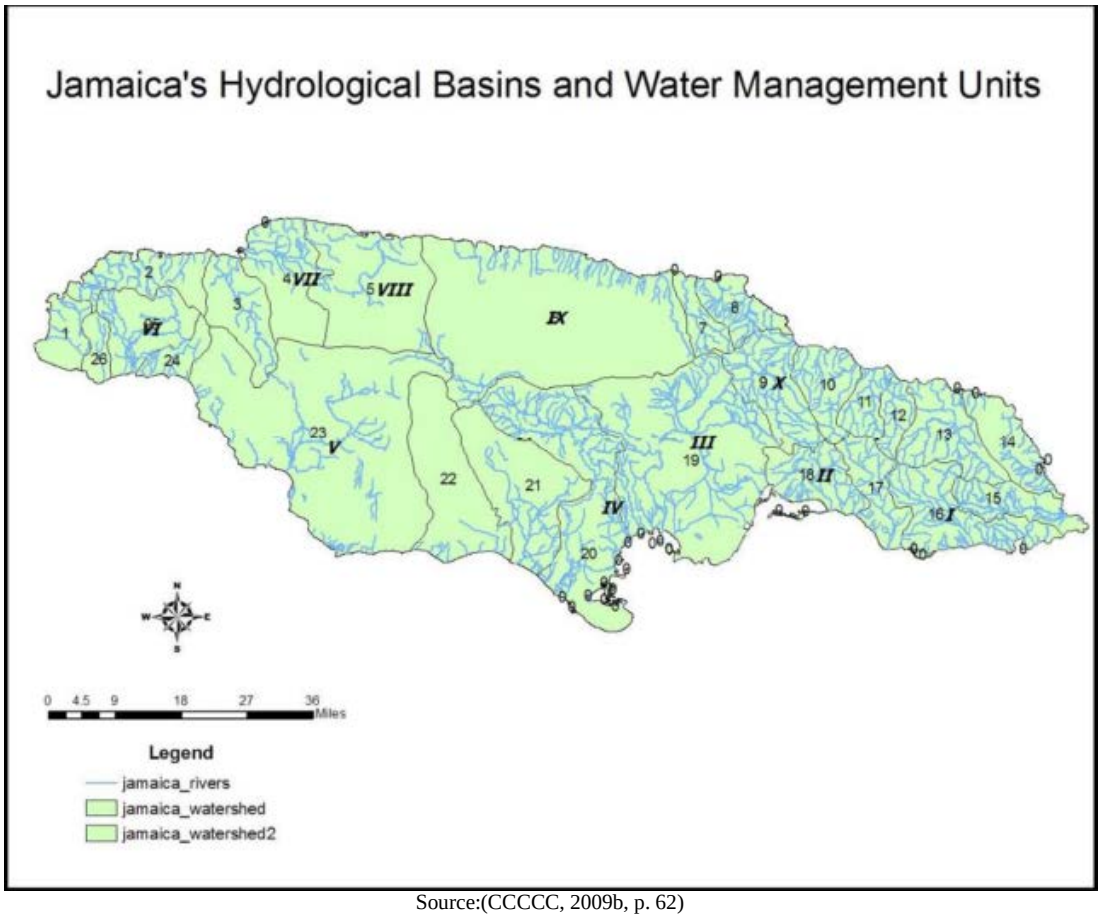
Figure 5. Main Water Agencies in Jamaica

Government Agencies	Role
Water Resources Authority (WRA)	The WRA is responsible for control and management of the nation's water resources. It regulates water resources availability, collection of water resources data (except precipitation) and the assessment, allocation, planning and management. Its main instrument of control is the issue of well drilling permits and abstraction licenses for both surface and ground water sources.
The National Water Commission (NWC)	The NWC is responsible for the public supply of drinking water and sewage treatment. It operates within the policy context of the Government of Jamaica's goal of universal access to potable water by the year 2010 and the establishment of sewerage systems in all major towns by 2020. Since the liberalisation of Water Services Sub-sector to include the participation of private enterprises as set out in the National Water Policy (1999), housing developers can develop their own water supply system and operate private water systems rather than handing over to the NWC, as was previously required.
The National Irrigation Commission (NIC)	The NIC is responsible for the supply of water for agricultural and irrigation uses, and is authorized to provide irrigation water nationally. It is important to mention that half of the total area irrigated is publicly managed by the National Irrigation Commission (NIC), while the other half is on individual private systems and on commercial estates (many oriented towards banana, papaya and sugar cane crops grown).
Rural Water Supply Company	The rural Water Supply Company is responsible for the execution of small rural projects.
National Environmental and Planning Agency (NEPA)	The NEPA is responsible for the implementation of environmental protection laws and regulations, and monitors water and wastewater quality. The institutional structure is relatively recent and the actors in the sector are evolving.

Source: (CCCCC, 2009b)

The Island is subdivided into ten major hydrological basins, which are "geographical areas drained by a particular surface water and/or groundwater system" (CCCCC, 2009b, p. 61). The basins have been further sub-divided into 26 watershed management units (WMU), which are grouped watersheds for the purpose of management (CCCCC, 2009b). The basins and Water Management units are shown below.

Figure 6. Jamaica's Hydrological Basins and Water Management Units



Source:(CCCCC, 2009b, p. 62)

Climate variability directly impacts watershed and catchment management. Increased occurrence of precipitation events has an impact on sediment erosion, movement and transport within basin river systems. Poor land use and agricultural practices exacerbate the vulnerability of watershed slopes to soil erosion and sediment transport (CCCCC, 2009b).

The vast majority of the public water supply in Jamaica is provided by the NWC. The question remains how well the NWC has managed hydrological basins through the watershed management units, especially under drought conditions. A 2014 editorial in the Jamaica Observer, a national newspaper, highlights weak governance in the water sector as an important cause of local vulnerability, regardless of climate variability: "There are 10 hydrological basins in Jamaica, none of which is optimally managed. The result of all of this is that even without a drought, one in four Jamaicans does not have access to piped water but rely on standpipes" (Observer, 2014).

Climate variability affects water supply systems across many parishes. This includes saline intrusion risks as well as the overuse of sensitive sources susceptible to dry. As the Draft Water

Sector Policy outlines, issues in service of water supply are not limited to the most vulnerable water management units. There are a large number of smaller communities that rely on springs and run-of-river sources for their water supply. These communities are particularly vulnerable during periods of drought, and suffer from shortages in supply and reduced reliability (CCCCC, 2009b). These problems are related to a lack of surface water storage in these localities. Other blame the poor water governance, and associate water shortage to " a man-made disaster because of the lack of an implemented policy of preservation of watersheds" (Jamaica Observer, 2014b).

The Draft Water Sector Policy also highlights problems resulting from lack of investment in water supply infrastructure development and maintenance (CCCCC, 2009b). For instance, no new reservoir has been built to supply the Greater Kingston area in the last sixty years, the most populated region of the island. Some local newspapers point the finger at the outdated water infrastructure as causing major water loss through leaking pipes (Jamaica Observer, 2014b).

Jamaican National Responses to Climate Change

Since 1995, the country has been a party to the United Nations Framework Convention on Climate Change (UNFCCC). In 1999, Jamaica also became a party to the Kyoto Protocol to the UNFCCC (CCCCC, 2009b).

As the Caribbean policy arena, adaptation has become a key focus for initiatives aimed at redressing the negative consequences of the changing climate in Jamaica (Popke et al., 2014). The government is modifying its government structure to include climate change into its national development processes and mechanisms. These changes are detailed below (Government of Jamaica, 2015)

In 2009, the country released a national development plan to the year 2030, which includes task forces focused on the Water Sector, Natural Resources Management and Climate Change and Natural Hazard Reduction, Urban and Regional Planning as well as several sector and social themes (Planning Institute of Jamaica, 2009). These initiatives have paved the way to review and prepare, among other policies, the *Draft National Water Sector Adaptation Strategy* (2009) and the *Climate Change Policy Framework* (2015).

The *Climate Change Policy Framework for Jamaica* is intended to support the goals of Vision 2030 by reducing the risks posed by climate change to all of Jamaica's sectors and development goals (Government of Jamaica, 2015). The policy aims "to create a sustainable institutional mechanism to facilitate the development, coordination and implementation of

policies, sectoral plans, programmes, strategies, and legislation to address the impacts of climate change" (Government of Jamaica, 2015, p. 8).The policy describes in detail how current governance will be adapted. The Ministry of Water, Land, Environment and Climate Change (MWLECC) is responsible for overseeing and supporting the implementation of the Policy Framework.

Besides the Policy Framework, the government of Jamaica is also reviewing its National Water Sector Policy. The water policy is, according to a local newspaper, about to be released (Williams-Raynor, 2015). The 2009 *Draft National Water Sector Adaptation Strategy* serves as a basis for this policy review. It was prepared under the Mainstreaming Adaptation to Climate Change Project led by the Caribbean Community Climate Change Centre (CCCCC). Proposed adaptation measures revolve largely around capacity building within key stakeholder and government agencies (i.e.,WRA, NIC and NEPA), especially regarding water monitoring, as well as enforcement of firmer physical planning laws and regulations (e.g., setbacks on coastal zones) to reduce risks to life and property from extreme rainfall and coastal flooding events (CCCCC, 2009b). A *National Building Code* has been developed concurrently to establish new guidelines for the construction of hurricane resistant buildings across the island. The Government of Jamaica has thus oriented its efforts towards adaptation to climate change.

Moreover, several initiatives have been undertaken to improve watershed management over several decades. This has included roles for planning agencies. For instance, the NEPA is now executing the *Integrating Watershed and Coastal Area Management in Small Island Developing States of the Caribbean* (IWCAM) project. The IWCAM is implemented regionally by the UNEP with the UNDP, and UNEP with the Caribbean Environmental Health Institute is the regional executing agency (CCCCC, 2009b). Among other recommendations, the *Draft National Water Sector Adaptation* strongly suggests working within the IWCAM to remedy poor land use and agricultural practices that increase the vulnerability of watershed slopes to soil erosion and sediment transport (CCCCC, 2009b).

In short, the recent policy frameworks undertaken by the Government of Jamaica aim to change the current institutional structure to tackle the multifaceted climate change issues. They highlight the need to reform current planning and land-use practices that exacerbate climate variability impacts. The next section explores climate justice dimensions in the above-mentioned policies.

Climate Justice in the Jamaica Water Climate Policy

The policy analysis is based on key concepts and frameworks outlined in the methodology section. It takes into account main elements and strategies of both the Draft *National Water Sector Adaptation Strategy* (2009) and the *Climate Change Policy Framework* (2015). The assessment evaluates justice through three criteria: EJ rationales, sustainability model, and complexity model.

1. What EJ Rationales Guide the Jamaican Climate Policy-Making Process?

Jamaica's climate response has focused on the uneven consequences of climate change on the island rather than on the (disproportionate) causes. The national government has directed resources toward enabling activities to cope with direct impacts of climate change, namely constant monitoring of sea level rise, changing rainfall patterns and increasing temperature. In the policy arena, this has translated into adaptation initiatives aimed at redressing the negative consequences of the changing climate (Popke et al., 2014). In that sense, we could state that the climate policy making privileges a pragmatic approach when addressing potential climate variability impact on national development goals.

The focus on redressing negative consequences of climate change has also been shaped through the multiple programs that supported the government of Jamaica in defining a local climate response. For example, the development of the *Climate Change Policy Framework for Jamaica* was prepared under the European Union and United Nations Environment Programme *Climate Change Adaptation and Disaster Risk Reduction Project*. The project was funded by the European Union under the Global Climate Change Alliance (GCCA) (Government of Jamaica, 2015). The framework acknowledges the financial and technical contribution of the United States Agency for International Development (USAID) and other agencies in the development of the Policy Framework (Government of Jamaica, 2015).Yet, the multiplicity of stakeholders involved in the Jamaica climate policy making reflects the heterogeneous environmental cooperation in the entire region (Jácome, 2006). To assess policy, Zeitoun et al. (2014) suggest questioning how particular framings of human-nature relations influence ideas of justice, and how these may shift over time (Zeitoun et al., 2014). Here, a careful analysis of the role of stakeholders and international donors in the policy making process could definitely inform what EJ rationales shape national response to climate change. This could be explored in future research.

The *Climate Change Policy Framework* (2015) makes explicit mention of justice. It first highlights the principles of inter-and intra-generational equity "to ensure that the rights to development of both current and future generations are equitably fulfilled" (Government of

Jamaica, 2015, p. 21). The policy also refers to UNICEF statistics, showing that children are more likely to suffer from climate change due to food insecurity, higher vulnerability to diseases, heat strokes, resource shortages and community displacements (Government of Jamaica, 2015). Moreover, justice is explicitly stated in concerns regarding gender equity: "Jamaican young men-at-risk for various forms of violence and marginalization and women-at-risk for gender-based assault, experience different vulnerabilities and have reduced capacities to adapt to climate change and therefore may have different concerns and inputs into decision making processes"(Government of Jamaica, 2015, p. 17). Therefore, the policy framework aims to support gender equitable development, in line with the Vision 2030 *Gender Sector Plan and the National Policy for Gender Equality*. Finally, the national framework aims to implement the Polluter Pays Principle, which makes a party (industry, organization, etc.) responsible for producing pollution accountable for paying for the damage done to the natural environment.

The examples make explicit the concern for justice at the national level, at least in the language of policy documents. The climate framework acknowledges higher vulnerability of a share of the population. It is linked to the vulnerability analysis of other policy unit. However, it does not discuss the causes underlying vulnerability. In addition, there is no explicit statement on how the policy aims to address the needs of the most vulnerable to increase their coping abilities.

As highlighted by Joshi (2014) for his Indian case discourses, there has been less about protecting the global environment, or even addressing poverty, than about protecting national and elite interests. The same question should be asked here: Whose environmental justice is discussed in international climate negotiations in the Jamaican context? How are the needs and concerns of the marginalized and underserved population represented? These are critical issues that should be addressed in the Caribbean context.

2. How is the Sustainability Model Defined?

Conroy & Berke (2004) suggest a set of indicators to help in evaluating sustainability in local planning processes and local plans. These indicators inform the assessment of the sustainability model proposed both in the *Draft National Water Sector Adaptation Strategy* (2009) and the *Climate Change Policy Framework* (2015). For the purpose of this SRP, we assess policy and plan at the national level.

The first indicator, **planning process**, starts with how sustainable development is being supported by the community. Both the *Climate Change Policy Framework* and the *Draft*

National Water Sector Adaptation Strategy make implementing an integrated development framework an explicit aim.

The climate framework represents in itself a national attempt to adapt the water management sector to climate vulnerability. The document acknowledges that "given the cross-cutting nature of climate change, there is an urgent need to develop an integrated approach in order to effectively build resilience at all levels and to have the required enabling policies in place" (Government of Jamaica, 2015, p. 5). The draft policy suggests strongly that the implementation of an Integrated Water Resource Management approach is needed to help management at the watershed level (CCCCC, 2009b). Some questions deserve to be asked here: As the IWRM approach is gaining in popularity in the policy arena globally, to what extent does it reflect Jamaican interests and aims? Are the government of Jamaica, namely the Ministry of Land, Water, Environment and Climate Change and the affiliated government agencies, ready to undertake this major policy shift? To what extent this aim will be translate into practice.

The *Draft Water Sector Policy* also includes techniques to assess the relationship between water consumption and the economy. It suggests the adoption of a Water Policy that pays particular attention to irrigation water in the agricultural sector, a major annual user of extracted water. Under climate variability, the agricultural sector requires better watershed management, improved drainage systems, and more rapid recovery response systems, particularly where smaller and more vulnerable farm units are impacted (CCCCC, 2009b). As the Draft Water Policy only makes recommendation, it is hard to assess to what extent these insights will be taken into account in the new Water Policy being now being reviewed. To critically evaluate how sustainable development is being supported by the community, it would be necessary to asses to what extent sustainability was a proposed framework from the population itself, and to what extent these propositions translated into policy commitments.

Public Participation is noted as a key component of sustainable agendas and their community support. In the planning process, participation is assumed to be a critical part of the paradigm shift towards planning for sustainable development (Berke & Conroy, 2000; Conroy & Berke, 2004).

Participation is outlined as a key objective in the *National Water Sector Adaptation Strategy*. It mentions that the "Government will employ a consultative and collaborative approach to respond to climate change. Information on the impacts of climate change and proposed response measures will be provided to the public to ensure awareness and understanding and also to encourage changes in attitudes and practices" (Government of Jamaica, 2015, p. 20).

Moreover, the government aims to include local communities, media, academia, research institutions, public and private sectors, NGOs, and CBOs. Here, a clear procedural justice dimension appears. In fact, the policy insists on including "those most vulnerable to climate change impacts, including women, children and the poor, in the development of strategies and approaches to address climate change" (Government of Jamaica, 2015, p. 20). This shows concerns as to the openness and the inclusiveness of the process, and its democratic accountability (Popke et al., 2014).

Public consultation is part of the water management review. In April 2014, an article released in the *Jamaica Observer* made mention of public consultations at key locations around the island to give the population the opportunity to influence the recently drafted Water Sector Policy. Full access to potable water is a major concern of the policy, especially for rural areas where access is critical (Jamaica Observer, 2014a). The senior director in the Policy and Monitoring Division of the Ministry of Water, explained to the newspaper "that people attending the consultations can be assured that their views on the policy will be treated seriously" (Jamaica Observer, 2014a). Peter Clarke, engineering manager at Rural Water Supply Limited — one of the stakeholder partners in the consultations — noted that the meetings are an excellent avenue to hear the concerns of the residents, especially since many rural communities are without a reliable source of water, and located in terrain that makes it difficult to get water to homes. The 2014 public consultation held throughout Jamaica suggests that people's view were heard and treated seriously, though numbers are not available. Berke and Conroy policy assessment indicators also suggest that "To work properly, participants must be confident that their suggestions and decisions will be listened to and acted upon." (Conroy & Berke, 2004, p. 1394). Further research in the scope of this SRP could be carried out on the quality and meaningfulness of the participation process in Jamaica to explore justice dimensions: Did all stakeholders (especially in rural areas) have an equal chance to be heard? How well is policy, and its outcomes, representative of the interests expressed by the community, and all interested groups?

Other potential users conflicts were highlighted in the *Draft Water Sector Policy*. In fact, climate change will present a challenge to the objective of ensuring clean water supply, for instance, to populations in dense areas where aquifers are threatened by saline (CCCCC, 2009b). As the majority of the population live along the coast, many aquifers are susceptible to as well as a large share of the population.

As part of the analysis of community support for sustainable development, Berke and Conroy (2000) note that **local capacity building** plays a crucial role in introduction, adoption and

implementation of any planning-related effort towards sustainable development (Berke & Conroy, 2000). This relates to technical skills, funding sources, expertise and data as basis for plan development.

Capacity building is critical for Jamaica, as many institutional weaknesses were noted in both policies. In fact, there is a limited legislative and regulatory support for integrating climate change considerations into policies and plans (Government of Jamaica, 2015). Besides, inadequate financial and technical resources, and the need for strengthened research and development within institutions, have limited the overall ability of the public and private sector to develop and advance key programmes, projects and action plans associated with climate change (Government of Jamaica, 2015). As discussed earlier, there are limited technologies available to allow for more accurate predictions; global models do not provide sufficient information on climatic conditions in the Caribbean, resulting in a limited understanding of local climatic processes.

The second indicator relates to **how sustainable development is being integrated as an organizing concept** (Berke & Conroy, 2000).

The *National Climate Change Framework* highlights the need to give more prominence to environmental and climate change issues in national social and economic policies: "There needs to be greater appreciation by decision-makers of the inter-relationship between environmental protection and management and socio-economic advancements to ensure that climate change issues are effectively addressed" (Government of Jamaica, 2015, p. 17). For instance, advancements made in key sectors such as transport, energy, tourism and agriculture have focused primarily on the social and economic achievements and outcomes, without due consideration to the impacts these changes may have on the environment (Government of Jamaica, 2015).

In short, a sustainability and integrated approach form the basis of *both the Draft National Water Sector Adaptation Strategy* (2009) and the *Climate Change Policy Framework* (2015). However, the biggest concern lies on the local capacity building in adopting and implementing planning-related effort towards sustainable development, with attention to the form of integration and the governance of sustainable development in light of climate change.

3. How are the policies dealing with complexity?

Adaptation and mitigation agendas require a whole set of restructurings. Applying à complexity framework in government structures, in combination with Berke & Conroy's approach, can help pave the way to a workable sustainable development framework

implementation (Ho, 2012). Institutionalizing complexity can help make government officials and policy makers more aware of subtle (often disregarded) sources of injustice. Elements of complexity outlined by Peter Ho (2012) will help to guide justice evaluation in Jamaica climate policies. As the policy framework is still in its implementation, the evaluation only raises questions on potential justice issues in light of the proposed measures. The same exercise should be done after the climate change framework and the new Water Sector Policy's implementation to assess the outcomes of the policies on the water sector.

- **Government Structure**

The government of Jamaica aims to implement a multi-sectoral approach to climate change. The government will integrate climate change adaptation and mitigation considerations in the development of legislation, policies, strategies, programmes, plans and projects of all Ministries, Departments and Agencies of Government (Government of Jamaica, 2015). Institutional change is underway.

The government recently created the **Ministry of Water, Land, Environment and Climate Change** (MWLECC). The ministry will be responsible for the **Climate Change Department** (CCD), the main stakeholder at the national, regional and international level for climate response (Government of Jamaica, 2015). At the national level, the CCD will be responsible for the overall implementation of the *Climate Change Policy Framework for Jamaica*, including the coordination of the Ministries, Departments and Agencies in the development and execution of their respective sector action plans. It should ensure effective communication and dissemination among all the parties, including with the general public. Besides, the CCD is to establish a national climate change database and information system to facilitate research and inform development planning and decision-making. The department will also coordinate Jamaica's representation at regional and international climate change negotiations to advance the country concerns and interests (Government of Jamaica, 2015). Finally, the CCD will act as the national coordinator and mediator for climate change programmes and activities led by regional and international bodies. To help serve CCD's mandate, **Climate Change Focal Points** (CCFN) will be appointed in all ministries, selected departments and agencies and representation will be invited from civil society groups and the private sector (Government of Jamaica, 2015). The CCFNs will also be responsible for coordinating development and implementation of respective sectoral and strategies in respect to climate change. They will monitor these departments' and agencies' actions and report it to the **CCD (Government of Jamaica, 2015).**

For better knowledge and expertise sharing, the **Climate Change Advisory Board** (**CCAB**) is to be created with representatives of the public and private sectors, academia and non-governmental organizations appointed by the Minister; portfolio responsibility will be for climate change (Government of Jamaica, 2015). The CCAB will provide recommendations to the MWLECC and the CCD on the possible elements of a national climate change research agenda as well as potential implementation partners. Therefore, the Advisory Board will be in good position to influence national research and methodologies on climate variability on the island.

In the water sector, the **MWLECC**, the **Water Resources Authority** and the **National Water Commission** will play the lead role in developing programmes that address water resources management including watershed protection and the scaling up of conservation programmes (CCCCC, 2009b). The MWLECC will also play a lead role for land use planning and development processes. This will take the form of enacting regulations for Environmental Impact Assessments of proposed developments, for example.

Ho (2012) warns against any attempt to create new departments to deal with new wicked problems; these departments may result in waste of resources and ineffectiveness if they do not contain enough organisational complexity (Ho, 2012). Some questions should be raised: What could be the potential opportunity and risk of having the Climate Change Department, especially with its enormous range of entitled influence and authority? What other mechanism will enable all departments and agencies to collaborate and exchange? Will the **CCFPs** in all Department and Agencies be equipped and ready to undertake and coordinate development and implementation of respective sectoral and strategies in respect to climate change? These questions could inform the development of the proposed change in environmental governance.

- **Flow of Information**:

Good, basic knowledge and relevant data should be held by every department so that each component of the larger organisation can respond to issues and challenges as they arise. Information should also circulate multilaterally between all government agencies and organization at all levels (local, national, regional, and international). This is particularly important for addressing climate change given their social, environmental, economic, political and cultural dimensions (Ho, 2012).

As discussed earlier in the proposed governance, the **CCFPs** and **CCD** are expected to communicate, collaborate, and exchange important information on a regular basis. As the *National Climate Change Framework* highlights, there is currently a lack of relationship

between environmental protection/ management and a socio-economic advancements to ensure that climate change issues are effectively addressed (Government of Jamaica, 2015). Will the proposed mechanism ensure multilateral information circulation between all government agencies and organizations at all levels? The **MWLECC** seems to have a decisive role in coordinating a huge amount of information and data. Will the **CCFPs**, the **Water Resources Authority**, the **National Water Commission** and other relevant agencies be able to access and exchange relevant information outside of the MWLECC, if necessary?

- **Collaboration and Expertise**

Different types of knowledge (everyday knowledge, scientific knowledge, traditional knowledge, etc.) are needed to address the wicked problems generated by climate change. The proposed climate change governance raises this question: Will the **Climate Change Advisory Board**, the **Climate Change Focal Points** and the **Climate Change Department** be sufficiently equipped and coordinated to build and exchange a variety of knowledge? Knowing that often Caribbean national governments lack crucial connection with local entities (e.g.,NGOs), as stated by Jácome (2006), there are concerns that additional efforts and measures will be needed to encourage such capacity.

The framework proposed by Ranganathan and Balazs (2015) can be useful in building collaboration and expertise at the local level between a range of stakeholders, in addition to helping foresee justice issues that are often hidden. Being aware of the "**everyday state**" and "**regulatory state"** practices in accessing water could be used to understand, for example, how the population in rural areas access water outside of the formal system, and how they cope with drought. It also could inform how informal settlements cope with flooding events.

- **Acknowledging Uncertainty**

Adaptive governance privileges a "search and discover" approach in climate policy and decision-making. This is even more important where uncertainty is primarily rooted in the lack of resources and technical resources. Particularly problematic for Jamaica is the lack of small-scale, local data, as discussed earlier. In this context, many decisions have to be taken under uncertainty.

Complexity science gives tremendous insights on how adaptive governance can tackle complex ecological knowledge, continuous monitoring, flexibility and dynamic learning, and the acceptance of uncertainty and surprise. Institutionalizing complexity can assist government officials and policy makers to become aware of injustices. These considerations are vital when exploring climate justice in Jamaica's policy-making process.

We have explored a concrete example of climate policy-making process in a Caribbean SIDS. We have seen that a large range of stakeholders, namely regional and international organizations, support policy processes in Jamaica. This suggests that the variety of stakeholders involved in the policy-making shape how EJ is implemented locally. Moreover, we have explored climate justice dimensions with a specific attention to the *Draft Water Sector Policy* and the *Jamaica Climate Change Framework*. Justice was assessed through three main dimensions: EJ rationales, sustainability model, and complexity model. This chapter has raised number of questions on Jamaica's capacity to translate policy aspirations into practice.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

This research project has explored how climate justice is articulated and understood in the Caribbean climate change policy-making, with particular attention to the water sector. First, the project explored how Environmental Justice (EJ) and Climate Justice (CJ) are conceptualized in the literature, especially from the perspective of low-income countries and the SIDS. Second, the project reviewed practices, concepts and benchmarks to evaluate policy and plans, paying attention to justice dimensions in the policy arena. The third chapter highlighted key water issues for SIDS in the Caribbean region under climate change. It also depicted the conditions which have led to in-depth reforms and new policies to adapt to climate variability. Finally, the last chapter made a preliminary assessment of climate justice dimensions in the Jamaican water sector, based on the *Draft Water Sector Policy*, and the *Jamaica Climate Change Framework*. It evaluated justice according to these questions: What environmental justice paradigm influences the shift in the Jamaican policy-making process regarding water management? How is the sustainability model defined? How are the policies dealing with complexity? This chapter helped identify potential gap between policy goals and climate justice concerns, and has raised number of questions on Jamaica's capacity to translate policy aspirations into practice.

The policy analysis has highlighted explicit concerns in the policy arena regarding the higher vulnerability of a share of the population. Concrete examples of inequality in ability to cope with climate change are numerous; for instance, there is the disproportionately high exposure of small farmers without access to irrigation systems under drought conditions, or the vulnerability of one-quarter of the Jamaican population who lack access to piped water during water shortage. The frameworks do not discuss the causes underlying this vulnerability, or how will policies actually address local inequalities in capacity to cope with climate variability. The conclusions of this Supervised Research Project are heading in the same direction as Popke et al. (2014): there is little explicit focus on the key issues surrounding climate change vulnerability in the Caribbean climate policy process. While it is true that Jamaica's climate policy frameworks include some assessment of poverty and direct justice concerns in terms of social and gender equity, there is almost no mention of inequality, and no clear debate of the political and economic factors that generates it (Popke et al., 2014).

Joshi (2014) suggests that climate negotiations have been less about protecting the global environment, or even addressing poverty, than about protecting elite interests. When translated into the Caribbean context, the questions remain: Whose environmental justice is discussed in the Jamaican policy arena? How are the needs and concerns of the marginalized and

underserved population represented? These are critical issues that should be addressed in the Caribbean context.

Moreover, the analysis has identified major concerns regarding local capacity building in adopting and implementing planning-related effort towards sustainability and integrated model. Will the country be able to implement the intended sustainability approach with a crucial lack of technical and financial resources? Finally, could the lack of resources impede the capacity of the government of Jamaica to deal with complexity?

The research demonstrates that the multilevel governance in the climate policy making process is a major issue. A variety of regional and international stakeholders shapes actual policy making at the national level. Major factors impede regional and national environmental cooperation, namely the lack of multilateral cooperation, the lack of financial and technical resources, and the lack of bottom-up mechanisms that connect the stakeholders at all levels. Finally, the research highlighted that most Caribbean governments privilege their relationships with international organizations. As a result, we typically find an absence of mechanisms for cooperation among NGOs within a single country. Sometimes, governments have no contact at all with NGOs in their own countries.

As outlined in the literature review, climate justice translates into a form of economic justice—the right to develop—for many low-income countries, and especially for India and China. Under the right to develop, environmental justice entails distributive justice, meaning a "fair share" of the benefits and resources available (Ikeme, 2003). The appropriation of globally owned common property of the atmosphere by developed nations constitutes an "ecological debt" (Ikeme, 2003). The early 1994 SIDS statements stressed the idea of ecological debt that demands compensation for past injustice damage and ongoing responsibility for climate change. However, this research highlighted that China's and India's EJ conception, among others, comes in conflict with SIDS' distributional justice concerns since the disproportionate share of climate change impact fall directly on small islands, especially in the Caribbean, with little ability to cope with and recover from climate-related disruptions (Popke et al., 2014), either at the regional or at the national level.

Concretely, the SRP suggests exploratory elements to consider when addressing climate justice in SIDS policy making. More importantly, it suggests observing how policy aspirations and justice concerns are deemed to be operationalized in the long term.

Recommendations for Planners Working in Caribbean SIDS Contexts

Scopes	
Regional Cooperation	• One of the most important factors to consider in regional environmental cooperation is the role regional and international bodies can perform. It is precisely within these organizations that the best opportunities exist to encounter different local environmental experiences and needs; they also present the best arenas for discussion and identification of common problems (Jácome, 2006). Planners working on SIDS in the Caribbean should be aware of this important opportunities and work towards existing regional cooperation mechanisms.
Public Participation	• In climate policy-making, participation is key element. Important questions should be asked: Is public participation involving a diversity of stakeholders? Is an equal opportunity offered to each member of the community to participate at every stage of the policy-making process? Is there imbalance of power between opposing groups? To what extent are all groups with a stake in environmental processes and outcomes granted the status, legitimacy and respect to be able to adequately represent their interests and positions? How are plans and their outcomes representative of the community? These questions should inform the policy-making process. • Middelbeek et al. (2014) argue that "well-facilitated and active involvement at the local level in developing and implementing climate change adaptation programs is critical considering that climate vulnerability is experienced locally and adaptive capacity and actions are best observed and realised locally" (Middelbeek et al., 2014, p. 139). They also suggest that the lack of measures at other levels that address underlying drivers of vulnerability limit the scale and outcomes of community actions against the changing climate impacts (Middelbeek et al., 2014). Therefore, planners should try to validate as much as possible if local cooperation mechanisms (e.g., local NGO) ensure communication between government agencies and local communities. On a more practical level, a question should be asked: Are the policies and resources in place known and recognized by the communities (especially in informal settlements)?
Resources	• Human and financial resources are obviously an important dimension in planning for sustainable development. Many authors argue that low levels of accomplishment of sustainable development plans are largely caused by inadequate resources. The question remains: how can planning departments at multiple levels foster a sustainability approach with limited financial and

	technical resources? How can regional cooperation help on that matter?
Planning Methodology and Practices	• Water management evolves in formal and informal contexts. The concept of "the everyday state" (Ranganathan & Balazs, 2015) that has expanded in the field of critical planning is useful when looking at informal settlements in Jamaica, and informal water provision. The concept is also valuable when looking beyond top-down regulations or at discrete sets of state agencies. As explained in chapter 2, "Everyday state" is brought to light through daily, messy negotiations between citizens and the state, in which the boundaries between the two become blurred (Ranganathan & Balazs, 2015). Moreover, the concept should be used among professionals in the field of water management and planning to better understand what drives settlement patterns and land use practices that have increased vulnerability of some areas.

Recommendations for Further Research

Field	
Political Economy/Ecology and Planning Practices	• Consequences of structural adjustment on national and local planning practices should be a topic of high interest for researchers who are involved in planning issues and water management in developing countries. Structural adjustment has had strong consequences for national governance practices and has determined, to a large extent, national trajectories of public sector activity, and therefore, the trajectories of resource management, land use and land development. Important questions need to be raised: For the Caribbean, how have economic structural changes exacerbated local inequalities since the 1980s and 1990s? What has been the impact of these major changes on people's abilities to cope with everyday life economic/ health issues? How does that contribute to their vulnerability to climate change today? An exhaustive review of past policies would be needed to fully grasp the origin of today's vulnerability.
Climate Discourse Analysis	• Joshi's analysis of official climate discourses in India should be carried out in the Caribbean (Joshi, 2014). This SRP highlighted distributional justice issues for the Caribbean SIDS not only at the global level, but also at the national level. This research raises questions on how vulnerable and poor communities are taken into account in policies, and how national policies intend to address internal inequalities that exacerbate climate change impacts. Are some climate policies and measures a "hiding behind the poor" strategy on some islands? What are the underlying motivations behind official climate discourses in small island contexts? As the Caribbean SIDS are strongly dependant of the world economy, these issues are more than relevant to explore.

Reference List

Agarwal, A., Narain, S., & Sharma, A. (2002). The global commons and environmental justice-climate change. In J. Byrne, L. Glover, & C. Martinez (Eds.), *Environmental justice: Discourses in international political economy* (Vol. 8, pp. 171-199). New Brunswick (US): Transaction Publishers.

Agyeman, J., Bullard, R. D., & Evans, B. (2003). *Just sustainabilities development in an unequal world*. London: Earthscan.

AOSIS. (2015). About aosis. Retrieved from http://aosis.org/about/

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners, 35*(4), 216-224. doi:10.1080/01944366908977225

Berke, P. R., & Conroy, M. M. (2000). Are we planning for sustainable development? An evaluation of 30 comprehensive plans. *Journal of the American Planning Association, 66*(1), 21-33. doi:10.1080/01944360008976081

Bond, P. (2013). Water rights, commons and advocacy narratives. *South African Journal on Human Rights, 29*, 125-143. Retrieved from <Go to ISI>://WOS:000341898700007

Brown, N., Geoghegan, T., & Renard, Y. (2007). *A situation analysis for the wider Caribbean*. Gland, Switzerland: IUCN.

Brundtland, G. H., World Commission on Environment Development, . (1987). *Report of the world commission on environment and development : "Our common future"* (U. Nations Ed.). New York: United Nations.

Bulkeley, H., Carmin, J., Broto, V. C., Edwards, G. A. S., & Fuller, S. (2013). Climate justice and global cities: Mapping the emerging discourses. *Global Environmental Change-Human and Policy Dimensions, 23*(5), 914-925. doi:10.1016/j.gloenvcha.2013.05.010

Bullard, R. D. (1994). *Unequal protection : Environmental justice and communities of color*. San Francisco: Sierra Club Books.

Byrne, J., Martinez, C., & Glover, L. (2002). A brief on environmental justice In J. Byrne, C. Martinez, & L. Glover (Eds.), *Environmental justice: Discourses in international political economy* (Vol. 8, pp. 3-17). New Brunswick (US): Transaction Publishers.

Caribbean360. (2014). Chikungunya virus outbreak in Jamaica takes toll on education system. *Caribbean360*. Retrieved from http://www.caribbean360.com/news/chikungunya-virus-outbreak-in-jamaica-takes-toll-on-education-system#ixzz43VXL8lcM

Carson, R., Darling, L., & Darling, L. (1962). *Silent spring*. Boston; Cambridge, Mass.: Houghton Mifflin ; Riverside Press.

Cashman, A., Nurse, L., & John, C. (2009). Climate change in the Caribbean: The water management implications. *The Journal of Environment & Development, 19*(1), 42-67. doi:10.1177/1070496509347088

CCCCC. (2009a). *Climate change and the Caribbean: A regional framework for achieving development resilient to climate change (2009-2015)*. Belmopan, Belize: Caribbean Community Climate Change Center (CCCCC).

CCCCC. (2009b). *Development of a national water sector adaptation strategy to address climate change in Jamaica*. Belmopan, Belize: Caribbean Community Climate Change Centre (CCCCC).

CCCCC. (2015). About ccccc. Retrieved from http://www.caribbeanclimate.bz/about-us/about-us.html

Conroy, M. M., & Berke, P. R. (2004). What makes a good sustainable development plan? An analysis of factors that influence principles of sustainable development. *Environment and Planning A, 36*(8), 1381-1396. doi:10.1068/a367

Cox, J. R. (2013). *Environmental communication and the public sphere*. Thousand Oaks, Calif.: SAGE Publications.

Everest-Phillips, M. (2014). *Small, so simple? Complexity in Small Island Developing States*. Retrieved from Singapore: http://www.undp.org/content/undp/en/home/search.html?q=Small%2C+So+Simple%3F+Complexity+in+Small+Island+Developing+States

Faiz Rashid, S. (2000). The urban poor in Dhaka city: Their struggles and coping strategies during the floods of 1998. *Disasters, 24*(3), 240-253. doi:10.1111/1467-7717.00145

First People Worldwide. (2016). About us. Retrieved from http://www.firstpeoples.org/

Garces-Restrepo, C., Vermillion, D., & Muñoz, G. (2007). *Irrigation management transfer: Worldwide efforts and results*. Retrieved from Rome: www.fao.org/3/a-a1520e.pdf

Girard, P., Boulanger, J. P., & Hutton, C. (2014). Challenges of climate change in tropical basins: Vulnerability of eco-agrosystems and human populations. *Climatic Change, 127*(1), 1-13. doi:10.1007/s10584-014-1241-x

Government of Jamaica. (2015). *Climate change policy framework for Jamaica*. Jamaica: Government of Jamaica.

Grineski, S. E., & Collins, T. W. (2008). Exploring patterns of environmental injustice in the Global South: Maquiladoras in ciudad juarez, mexico. *Population and Environment, 29*(6), 247-270. doi:10.1007/s11111-008-0071-z

Ho, P. (2012). *Governing for the future: What governments can do* (248). Retrieved from Singapore: https://www.rsis.edu.sg/search/?q=Governing+for+the+Future%3A+What+Governments+can+do

Ikeme, J. (2003). Equity, environmental justice and sustainability: Incomplete approaches in climate change politics. *Global Environmental Change-Human and Policy Dimensions, 13*(3), 195-206. doi:10.1016/s0959-3780(03)00047-5

Jácome, F. (2006). Environmental movements in the Caribbean. In B. D. L. Sherrie L. Baver, Marin Miller, Manuel Valdes Pizzini, Maurice Burac, Neftali Garcia-Martinez (Ed.), *Beyond sun and sand: Caribbean environmentalisms* (pp. 17-31). New-Brunswick: Rutgers University Press.

Jamaica Observer. (2014a). Water sector policy consultations start today. *Jamaica Observer*. Retrieved from http://www.jamaicaobserver.com/news/Water-Sector-Policy-consultations-start-today_16437200

Jamaica Observer. (2014b). Water shortage in Jamaica is a man-made disaster, not an act of God. *Jamaica Observer*. Retrieved from http://www.jamaicaobserver.com/editorial/Water-shortage-in-Jamaica-is-a-man-made-disaster--not-an-act-of-God_17221554

Johnson, J. (2015). Coffee farmers worried, say drought will affect them significantly. *The Gleaner*. Retrieved from http://jamaica-gleaner.com/power/54188

Joshi, S. (2014). Environmental justice discourses in Indian climate politics. *GeoJournal, 79*(6), 677-691. doi:10.1007/s10708-014-9545-y

Kelman, I. (2010). Hearing local voices from Small Island Developing States for climate change. *Local Environment, 15*(7), 605-619. doi:10.1080/13549839.2010.498812

London, J. B. (2007). Implications of climate change on small island developing states: Experience in the Caribbean region. *Journal of Environmental Planning and Management, 47*(4), 491-501. doi:10.1080/0964056042000243195

Mehta, L., Allouche, J., Nicol, A., & Walnycki, A. (2014). Global environmental justice and the right to water: The case of peri-urban Cochabamba and Delhi. *Geoforum, 54*, 158-166. doi:10.1016/j.geoforum.2013.05.014

Middelbeek, L., Kolle, K., & Verrest, H. (2014). Built to last? Local climate change adaptation and governance in the Caribbean – the case of an informal urban settlement in Trinidad and Tobago. *Urban Climate, 8*, 138-154. doi:10.1016/j.uclim.2013.12.003

Ministry of Water and Housing. (2004). *Jamaica water sector policy: Strategies and action plans*. Jamaica: Government of Jamaica.

Mulreany, J. P., Calikoglu, S., Ruiz, S., & Sapsin, J. W. (2006). Water privatization and public health in Latin America. *Revista Panamericana De Salud Publica-Pan American Journal of Public Health, 19*(1), 23-32. doi:10.1590/s1020-49892006000100004

Mustafa, D., & Reeder, P. (2009). 'People is all that is left to privatize': Water supply privatization, globalization and social justice in Belize city, Belize. *International Journal of Urban and Regional Research, 33*(3), 789-808. doi:10.1111/j.1468-2427.2009.00849.x

Nurse, L. A., McLean, R.F., Agard,J., Briguglio, L.P., Duvat-Magnan,V. , Pelesikoti,N., Tompkins, E. and A. Webb. (2014). *Small islands*. Retrieved from Cambridge, UK http://hcl.harvard.edu/collections/ipcc/

Okereke, C. (2006). Global environmental sustainability: Intragenerational equity and conceptions of justice in multilateral environmental regimes. *Geoforum, 37*(5), 725-738. doi:10.1016/j.geoforum.2005.10.005

Perret, S. (2006). New paradigms, policies and governance in the water sector. In S. Farolfi, Hassan, Rashid, and Perret, Sylvain (Ed.), Water Governance for Sustainable Development : Approaches and Lessons from Developing and Transitional Countries. Versailles, FRA: ProQuest ebrary. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-

84925745924&partnerID=40&md5=72ab04f455dc32a87723bfbc6b03e885. doi:10.4324/9781849773768

Planning Institute of Jamaica. (2009). *Vision 2030 Jamaica: National development plan*. Jamaica: Government of Jamaica.

Popke, J., Curtis, S., & Gamble, D. W. (2014). A social justice framing of climate change discourse and policy: Adaptation, resilience and vulnerability in a Jamaican agricultural landscape. *Geoforum*. doi:10.1016/j.geoforum.2014.11.003

Rajack, R., & Barhate, S. (2004). *Urban poverty and habitat precariousness in the Caribbean*. Santiago, Chile: United Nations.

Ranganathan, M., & Balazs, C. (2015). Water marginalization at the urban fringe: Environmental justice and urban political ecology across the north-south divide. *Urban Geography, 36*(3), 403-423. doi:10.1080/02723638.2015.1005414

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences, 4*(2), 155-169. doi:10.1007/BF01405730

Sachs, J. (2008). *Common wealth : Economics for a crowded planet*. New York: Penguin Press.

Shiva, V. (2008). *Soil not oil : Environmental justice in a time of climate crisis*. Cambridge, Mass.: South End Press.

Shiva, V. (2010). *Staying alive: Women, ecology and development*. New-York: South End Press.

Small Island Developing States Network. (1994). *Global conference on the sustainable development of Small Island Developing States*. Retrieved from Bridgetown, Barbados: http://www.un-documents.net/ac167-9.htm

Small Island Voices. (2015). A strong voice for small islands. Retrieved from http://www.unesco.org/csi/smis/siv/sivindex.htm

Taylor, D. E. (2000). The rise of the environmental justice paradigm: Injustice framing and the construction of environmental discourses. *American Behavioral Scientist, 23*(4), 508-580. doi:10.1177/0002764200043004003

The University of Texas at Austin. (2016). Map collection: Jamaica maps. Retrieved from http://www.lib.utexas.edu/maps/jamaica.html

TriniView.com. (2011). Fondes Amandes community reforestation project. Retrieved from http://www.triniview.com/articles/fondes.html

Turnhout, E., Hisschemöller, M., & Eijsackers, H. (2007). Ecological indicators: Between the two fires of science and policy. *Ecological Indicators, 7*(2), 215-228. doi:10.1016/j.ecolind.2005.12.003

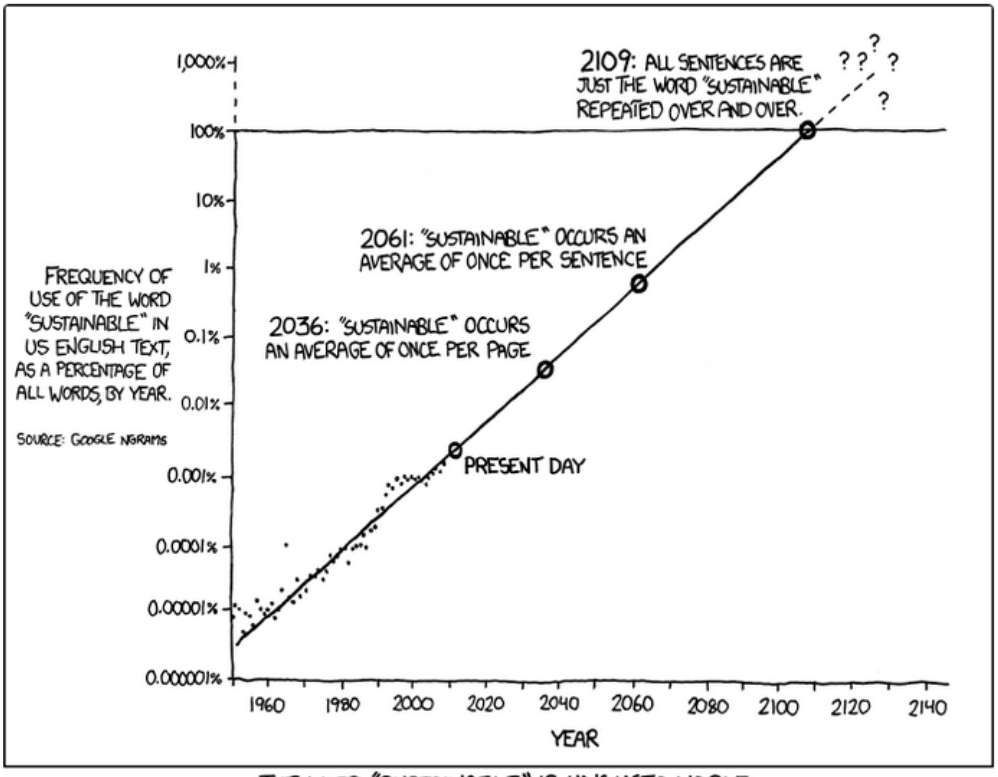
United Nations Environment Programme (UNEP). (2008). Vital water graphics: An overview of the state of the world's fresh and marine waters 2nd Edition. Retrieved from http://www.unep.org/dewa/vitalwater/article141.html

Williams-Raynor, P. (2015). Jamaica accelerates work on new water policy. *The Gleaner*. Retrieved from http://jamaica-gleaner.com/article/news/20150901/jamaica-accelerates-work-new-water-policy

Zeitoun, M., Warner, J., Mirumachi, N., Matthews, N., McLaughlin, K., Woodhouse, M., Cascao, A., & Allan, T. (2014). Transboundary water justice: A combined reading of literature on critical transboundary water interaction and 'justice', for analysis and diplomacy. *Water Policy, 16*, 174-193. doi:10.2166/wp.2014.111

Appendix A

Figure 7. The Word Sustainable is Unsustainable



THE WORD "SUSTAINABLE" IS UNSUSTAINABLE.

xkcd – The Word Sustainable is Unsustainable – http://xkcd.com

Appendix B

Figure 8. Main Stakeholders Involved in the Climate Change Governance in the Caribbean

Organizational Level	Stakeholders	Role in Climate Change Governance
International/ Multilateral	Alliance of Small Island States (AOSIS)	Fosters ad hoc lobby and negotiating voice for Small Island Developing States (SIDS) within the United Nations system.
	World Bank	Provides financial and technical support in multilateral projects; Represents one of the major players in Caribbean Climate Policy.
	Small Island Voice (UNESCO)	Brings local voices to international organisations and arenas that deal with climate change; Endorses Climate Frontlines (Climate Frontlines 2009) as a forum to document local experiences, observations, and strategies related to climate change impacts, vulnerabilities, opportunities, and adaptation.
	World Wildlife Fund (WWF)	Brings local voices, including those from SIDS, to national and international science and lobbying.
	Global Water Partnership (GWP)	Endorses international network open to all organisations involved in water resource management; Fosters Integrated Water Resources Management (IWRM).
Regional organizations/ governments/ institutions	Caribbean Community Climate Change Center (CCCCC)	Represents legal counsel of the Caribbean Community; Coordinates the Caribbean region's response to climate change; Acts as a key node for information and research on climate change issues.
	CARICOM	Promotes economic integration and cooperation among its members; Coordinates economic policies and development planning; Plans and establishes special projects for the less-developed countries within its jurisdiction; Acts as a regional single market for many of its members; Handles regional trade disputes.
	Organization of Eastern Caribbean States	Focuses on economics and international politics which has included tackling climate change
	University of West Indies	Focuses on higher education and scientific research for the region while sharing administrative and maintenance costs.
	Economic Commission for Latin America and the Caribbean (CEPAL)	Implements biennial programme of work; Provides technical cooperation to supplement and feed into the Commission's analytical and normative work and efforts in applied research and knowledge creation and management.
	Inter-American Development Bank (IDB)	Provides financial and technical support for countries working to reduce poverty and inequality through health, education and infrastructure improvement programs.

Regional NGOs	Caribbean Policy Development Center	▪ Acts as a coalition of Caribbean non-governmental organizations; ▪ Sensitizes NGOs and the general public on key policy issues; ▪ Aims to influence policy makers on decisions which put the interests of Caribbean people at the center of the Caribbean development strategy.
	Caribbean Natural Resources Institute (CANARI)	▪ Focuses on environmental policy; ▪ Emphasizes on projects that foster sustainable development and environmental education (privileges long term projects)
	CARIBSAVE	▪ Aims to innovate, connect and implement practical solutions for sustainable development and climate change.