



## D2.4: “Community based sustainable management and governance models in water and biodiversity systems”

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# Index

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<b>Executive summary</b>	<b>V</b>
<b>List of figures</b>	<b>VII</b>
<b>List of abbreviations</b>	<b>VII</b>
<b>1 Introduction</b>	<b>1</b>
<b>2 The concept of Governance: tendencies and assumptions</b>	<b>1</b>
<b>3 The relation between Culture, Biodiversity, and Governance</b>	<b>3</b>
3.1 The relation between Culture and Biodiversity	4
3.2 The governance of Biodiversity and the role of Culture	5
<b>4 Methodology and Case Study Description</b>	<b>6</b>
4.1 Case study description	7
<b>5 Results (The structure of governance of biodiversity and water)</b>	<b>8</b>
5.1 The macro level	9
5.2 The meso level	12
5.3 The micro level	14
5.3.1 Micro-structure for the fishing and hunting system	16
5.3.2 Micro-structure for the forest system	18
5.3.3 Micro-structure for the extraction of gold resources (mining)	19
5.3.4 Micro-structure for the management of agro-biodiversity	20
<b>6 Analysis of the results</b>	<b>21</b>
<b>7 Conclusions and lessons learned</b>	<b>23</b>
<b>8 References</b>	<b>25</b>
<b>Annex I. National regulations related to the collective territory of Afro-Colombian communities</b>	<b>33</b>

# Executive summary

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This document is the fourth deliverable (D2.4) of work package 2 (WP2). This document consolidates the results of the implementation of the previous methodological tools from COMET-LA project, which were the characterization of socio-ecological systems (SESs) based on the approach of Ostrom (2009) as presented in deliverable D.1.1 (Locally Adapted Tools for the Characterization of Socio-ecological Systems); the identification of relevant variables that explain the dynamics of socio-ecological systems through a prospective structural analysis (PSA), results presented in deliverable D.2.2 (View of Actors on Problems and Change Factors in Relation to Environmental Challenges); along with results of a participatory exercise to construct future scenarios presented in deliverable D.2.3 (View of Actors on Perspectives for the Future).

The goal of this deliverable is to present an analysis of the governance system for water and biodiversity in the socio-ecological systems of the Colombian Pacific coast, specifically for the two Community Councils of the case study: Alto y Medio Dagua and Bajo Calima. An extensive literature review was carried out concerning the concept of governance and approaches taken to its analysis. Empirical data, survey results, workshops, and interviews with community members were also used to describe and analyze key characteristics of community models of governance at the macro, meso, and micro levels, and to identify policy implications based on the conclusions and lessons learned. The principal conclusions of this project are the following:

- The results demonstrate a high correlation between biodiversity, culture, and the governance of socio-ecological systems (SESs), and the necessity of considering this relation in analytical models and strategies for community management.
- The local mechanisms of governance systems are based on internal and external factors through the development of nested institutions and the transformation of socioeconomic and political networks.
- The governance system that was analyzed includes a very heterogeneous set of actors with divergent interests and diverse strategies for accessing and managing natural resources.
- The governance system does not undergo a linear process of change, but it takes an evolving course whose dynamics may include abrupt changes as a result of biophysical or socioeconomic disruptions.
- The governance system for water and biodiversity in the Colombian case study has multiple levels that include multiple, polycentric, and generally unstable power centers.
- The evolution of the governance system includes periods of strengthening and weakening and a changeable set of actors who participate in the structure. These changing characteristics determine the quality of relations among actors and the type of institutions that predominate.

Finally, from the analysis on the local context, we identified the following three main situations that emerge as challenges for the governance of the studied system: 1) Transformations in the governance system are directly tied to changes in institutional contexts and cultural dimensions in the region. Because of this, it is difficult to correlate governance system change with changes in the natural environment as such; 2) Current mental models see governance systems for biodiversity and water as balanced, benign, resilient, and homogeneous with an intrinsic capacity for reorganization. This vision complicates the identification of lessons learned and their transmission to the sphere of environmental management; and 3) A more flexible view of the structure of biodiversity and water governance systems than that which currently predominates in Latin America need to be adopted. Policymakers tend to not take the structures of governance systems (GSs) into account or consider them as rigid and homogeneous, exclusively dependent on top-down governance dynamics.

# List of figures

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Figure 1. Productive-extractive systems in the territories of the studied Afro-Colombian communities. .... 8

Figure 2. The institutional structure and its different levels. Based on Ostrom (2005). .... 9

Figure 3. Micro-structural level of the Governance system of the Community Councils. ....15

Figure 4. Hierarchical influence of public policy on the governance of natural resources (water and biodiversity) in Community Councils.....16

Figure 5. Micro-structure of the fishing and hunting system..... 17

Figure 6. Micro-structure for forest system.....18

Figure 7. Governance system micro-structure for mining resources (Alluvial gold mining). ....19

Figure 8. Micro-structure system for the governance of agro-biodiversity..... 20

# List of abbreviations

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	<b>English</b>	<b>Spanish</b>
<b>AMDA</b>	Community Council of Alto y Medio Dagua	Consejo Comunitario de Alto y Medio Dagua
<b>BACA</b>	Community Council of Bajo Calima	Consejo Comunitario de Bajo Calima
<b>CC – CC’S</b>	Community Councils	Consejos Comunitarios
<b>COMET-LA</b>	Community-based management of environmental challenges in Latin America	Gestión Comunitaria de los Desafíos Ambientales en Latinoamérica
<b>CITES</b>	Convention on International Trade in Endangered Species	Convención sobre el comercio internacional de especies amenazadas de fauna y flora silvestres
<b>CVC</b>	Valle del Cauca Regional Corporation for environmental issues	Corporación Autónoma Regional del Valle del Cauca
<b>FUNDAPAV</b>	Social-Agro-environmental Foundation “Pacífico Vivo”	Fundación Social Agro Ambiental “Pacífico Vivo”
<b>GWP</b>	Global Water Partnership	Asociación Mundial para el Agua
<b>IAvH</b>	Alexander von Humboldt Biological Research Institute	Instituto de Investigaciones Biológicas Alexander von Humboldt
<b>PNGIBSE</b>	National Policy for Comprehensive Management of Biodiversity and its Ecosystemic Services	Política Nacional de Gestión Integral de la Biodiversidad y sus Servicios Ecosistémicos
<b>PNGIRH</b>	Integrated National Management Plan on Water Resources	Política Nacional de Gestión Integral del Recurso Hídrico
<b>POMCA</b>	Watershed Control and Management Plan	Plan de Ordenamiento y Manejo de Cuencas Hidrográficas
<b>PSA</b>	Prospective Structural Analysis	Análisis Estructural de la Prospectiva
<b>WWF</b>	World Wild Foundation	Fondo Mundial para la Naturaleza

## **1 Introduction**

This is a time of growing global concern for the sustainable use and management of biodiversity and water. Over the last three decades, factors including infrastructural development, population growth, and the illicit extraction of natural resources have led to a loss of biodiversity and a declining quality of water in the region of the Colombian Pacific coast (Avendaño, et al., 2013). Since the 1990s, however, Afro-Colombian communities have been appropriating territory through the conformation of ethno-territorial entities called Community Councils, which have become power centers in a community-based administrative and governance system, currently undergoing consolidation, that is oriented toward facilitating and sustaining a decision making process with respect to the sustainable use of natural resources and their conservation. Together, these two opposing processes (use and conservation) challenge and influence the evolution of a changing biodiversity and water governance system in the Colombian Pacific region.

In this context, the central inquiry that orients this document is how to interpret the process of change and adaptation of biodiversity and water governance systems (GSs). In addition to this, what implications can be pointed out to local organizations and decision makers, so that both scientists and communities can more appropriately participate in this process of change? The main question is explored by examining the state-of-the-art in relation to the concept of governance, and by analyzing the relations between biodiversity, culture, and governance. Next, we present our analysis of the structure of the governance systems in the Colombian Pacific region in general, and two Community Councils of Black Communities in particular: Alto y Medio Dagua and Bajo Calima. Finally, in the last section of the document we identify some conclusions and lessons learned.

## **2 The concept of Governance: tendencies and assumptions**

This document addresses a question that goes beyond the limits of political science and is now being taken up in a growing body of interdisciplinary literature wherein GSs are understood as multi-leveled structures oriented by the principles of democratization and the decentralization of decision-making processes, subject to permanent change. GSs fulfill a set of functions that represent a new way of carrying out public administration and the sustainable management of natural resources. This structure links together a wide variety of interests, capacities, and forms of power that are implemented by actors at multiple levels whose interactions are regulated by public and private as well as formal and informal institutions to help them reach concrete objectives that may not always be shared (Ortiz-Guerrero, Ocampo-Díaz, Avendaño-Uribe & Ramos, 2014). This complex and multi-leveled structure has been studied from various perspectives that can be synthesized and categorized into at least five major tendencies.

The first tendency approaches public administration through the recognition of the state as one actor among others in the development process, and one which from a normative point of view should cooperate with the others that have roles to play in the process (Jiménez, Chaparro, & Roncancio, 2007; Aguilar-Villanueva, 2009; Kapucu, Yuldashev, & Balkiev, 2009;



Termeer, Dewulf, & Van Lieshout, 2010; Sánchez-Dorantes, 2012; Weber, Krogman, & Antoniuk, 2012; Cheshire, Everingham, & Lawrence, 2014). Studies that reflect this orientation take up topics such as forms of spatial governance and an explanation of regional disparities (Morrison, T.H., 2014); the role of actors and organizations (Díaz, Gallego, & Vidueira, 2011; Beer, 2014); the effects of governance dynamics on legal and institutional frameworks (Ebbesson, 2010); and the appropriation and autonomous administration of territory (Bermúdez, 2009).

The second tendency focuses on the role of different components of the structure of GSs. Studies have focused among other things on the role of participants and their interactions that connect different levels of the system; the dynamics that make GSs multi-leveled and polycentric systems (Paavola, Gouldson, & Kluvánková-Oravská, 2009; Termeer, et al., 2010; Niedzialkowski, Paavola, & Jedrzejewska, 2012; Prior, Daly, Mason, & Giurco, 2013; Fischer, et al., 2014); the institutions that regulate these interactions (Agrawal, et al., 2013); the social networks that emerge from multiple interrelations (Ernstson, 2010; Agrawal, et al., 2013); and the many resource and capital flows that these networks produce (Sikor, et al., 2013). Works with this orientation frequently allude to the failure of intrusive and top-down regulatory policies (Agrawal & Gibson, 1999) and propose the renovation and decentralization of policy and administrative instruments with respect to renewable natural resources (Antunes, Kallis, Videira, & Santons, 2009; Moreno-Sánchez & Maldonado, 2010; Zamudio-Rodriguez, 2012; Hodge & Adams, 2013; Bas, et al., 2014; Bixler, 2014; De Koning, 2014); as well as non-renewable resources (Cheshire, Everingham, & Lawrence, 2014); and protected areas (Durán, 2009).

The third tendency concentrates on the analysis of factors and forms of intervention that affect the structural properties and characteristics of natural resource GSs. Factors studied have included corruption (Smith, et al., 2003), social organization (Díaz, Gallego, & Vidueira, 2011), and aggregates of socioeconomic and ecological factors (Fischer, et al., 2014; Ortiz-Guerrero, et al., 2014). As for forms of intervention, the most common focus is co-management (Moreno-Sánchez & Maldonado, 2010; Agrawal, et al., 2013; Yitbarek, Tadie, Timer, & Fischer, 2013).

The fourth tendency aims to explore in depth the properties of particular GS regimes in terms of their evolution, adaptation, and change, proposing thus a study of GSs from a normative perspective. Multiple analyses fall into this category, including adaptive governance (Termeer, et al., 2010; Garmestani & Harm-Benson, 2013; Oviedo-Carrillo, 2014); good governance (Rhodes, 1996; Bridges, 2013); collaborative governance (Kapucu, Yuldashev, Balkiev, 2009); corporate governance (Olsson, Folke, & Berkes 2004; Bortolotti & Perotti, 2007; Biesenthal & Wilden, 2014); urban governance (Rhodes, 1996, Ernstson, 2010); global governance (Rhodes, 1996; Sikor, et al., 2013); environmental governance (Bixler, 2014); and the governance of conservation (Jepson, Ladle, & Sujatnika, 2011; Mwakaje, et al., 2013).

Finally, the fifth tendency includes elements of the others and proposes new frameworks for exploring the governance of SESs by studying the reticular dynamics between ecosystems and social groups, the incorporation of ecological knowledge in ecosystemic interventions and management, and the creation of mechanisms for dealing with disturbances, uncertainty, and

the surprise factor, all conditions that are inherent to complex systems (Olsson, Folke & Berkes, 2004; Folke, Hahn, Olsson & Norberg, 2005; Janssen & Ostrom, 2006; Duit, Galaz, Eckerberg, & Ebbesson, 2010).

By analyzing these five tendencies it is possible to identify three general assumptions on the basis of which we can undertake an interpretative exercise with respect to GSs:

- a) The first assumption entails accepting that the structure of a GS channels a decision making process, which depending on the effects of positive factors (e.g. local demands) or negative ones (e.g. the level of corruption among actors), may or may not be a successful process. This perspective focuses on discussing qualitative aspects of the process. Nonetheless, this perspective is commonly accompanied by a view of the GS as a homogeneous structure with a linear process of change (e.g. Smith, et al., 2003), disclaiming the potential capacity of the GS structure and its characteristics to influence the orientation of the inter-relations and exchange processes among actors.
- b) The second assumption consists of accepting that multi-level governance facilitates decision making in natural resource administration among actors at different levels and in different positions. Thus it makes visible the participation of multiple actors, establishing a polycentric system (e.g. Niedzialkowski, Paavola & Jedrzejewska, 2012). This perspective presupposes the long-term stability of the system resulting from a relational network among a group of actors, assumed to be equally stable. This perspective usually does not describe how these relationships are also regulated under the influence of a diverse set of formal and informal institutional logics, which themselves vary in keeping with the reconfigured composition of actors participating.
- c) The third assumption entails accepting that the structure of a GS makes possible the relations among the various actors who have an interest in it. From this point of view, though, government actors are usually included in the GS without distinction under the assumption that their decisions are operationalized through homogeneous, vertical, top-down policy flows, and that all the actors and socio-ecological dynamics oriented by the GS are likewise connected vertically and homogeneously (e.g. Ernstson, 2010). It is also assumed that policy flows and the decisions of private or mixed-sector actors are not affected by the structure of the GS, and that policy devolves from the national to local government entities in a coordinated fashion without undergoing transformations as to its goals or logic.

These three assumptions are explored in the document, first by analyzing the way we understand the links between biodiversity, culture, and governance, and then through a detailed analysis of the structure and dynamics of GSs in the Community Councils of Alto y Medio Dagua and Bajo Calima.

### **[3 The relation between Culture, Biodiversity, and Governance](#)**

According to the Convention on Biological Diversity, biodiversity is the variety of live organisms, terrestrial and aquatic ecosystems, and the diversity within each species and

among species. (CDB, 1992). We recognize today, however, that the concept includes not only biological diversity, but also cultural diversity and cosmological diversity in relation to the meaning of life (Berkes, 2008; Maffi, 2005; Pretty et al., 2008). This flexibilization of the concept of biodiversity stems on the one hand from the need to recognize the impact of human activity on it (Núñez, González-Gaudiano, & Barahona, 2003); and, on the other hand, from a recognition of how indigenous groups, peasants<sup>1</sup>, and Afro-descended communities conceive of and relate to elements of biodiversity, giving rise to a diversity of ethnicities, cultures, and fusions of cultures that establish their own GSs to determine the uses of biodiversity in culturally differentiated ways (Toledo, 1994; Tréllez & Wilches, 1999; Núñez, González-Gaudiano, & Barahona, 2003).

In the context of this cultural and biological diversity, the governance of biodiversity and water constitutes a key challenge for the consolidation and survival of Community Councils in the Colombian Pacific region. In trying to understand how culture affects this relationship, we consider how the challenge can be faced from a local point of view in order to improve future planning conditions under different scenarios and configurations of the relationship. In this section, we will initially explore the relation between biodiversity and culture, and then we identify the ways this dynamic affects the governance of biodiversity and water.

### 3.1 The relation between Culture and Biodiversity

The importance of the relation between culture and biodiversity in Afro-Colombian communities in the Pacific region of Colombia is reflected in the close connection between territory, natural phenomena, and human beings in these communities, expressed through their identity and traditional practices. This accounts for the difficulty of separating human beings and nature from local culture and traditions (Oslender, 2001). In the cases under study, the rivers and the forest constitute the principal factors that connect social, economic, and cultural processes. People's livelihoods depend on the forest and the river, and an institutional structure has been created around them for the management of extractive-productive systems, deeply rooted in cultural practices (Sánchez, 1998).

Over the course of their historical development, Afro-Colombian communities have constructed different values, institutions (or sets of standards), social networks, and systems of shared beliefs in order to satisfy their basic needs, organize social structures, and generate relational dynamics both internally and with other social groups and the natural environment. This set of material, symbolic, and relational elements falls under the concept of culture (Ortiz-Guerrero, 2011).

As a result, Afro-Colombian communities establish various forms of interaction with their ecosystems through their institutions in order to construct and manage a livelihood in each particular territory. This relational mechanism is called the cultural domain. In this sense, the territory represents a cultural space, which cannot be understood aside from the survival of the rural society. As these social groups establish their culture, institutionality, and

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<sup>1</sup> Translation chosen for "campesinos".

territoriality, they transform ecosystems and transform themselves in a complex and dynamic process. The aggregate result is the environment, a particular manifestation of the cultural and biophysical transformations generated by a rural society in a specific place and a specific historical context (González, 2006; Ortiz-Guerrero, 2011).

The relations between society and nature are based, then, on cultural systems which are particular to different social groups. Those cultural systems make possible the appropriation and transformation of the territory. This institutional structure produces material transformations in ecosystems that, depending on their nature, determine the long-term sustainability of forms of livelihood and consequently of corresponding human populations (González, 1995, 2006; Magistro & Ronofcoli, 2001; Milton, 1997).

In this document, we understand the relationship between biodiversity and culture as the institutional structure used by the Afro-Colombian communities of the Community Councils of Alto y Medio Dagua and Bajo Calima in order to interact with the extremely humid tropical ecosystems of the Colombian Pacific region to establish and manage their livelihood (González, 1995, 2006; Magistro & Roncoli, 2001; Milton, 1997; Ortiz-Guerrero, 2011). Multiple mechanisms for interaction with the environment can be identified in this process, as described in section 5. In this document, they represent the micro level of the GS structure.

These mechanisms allow to observe how nature and culture converge at multiple levels: for instance: the values and ways of understanding and relating to the natural environment, the rules that regulate this relationship and the types of livelihoods that make this relationship possible. For this reason there is an ongoing feedback cycle between culture and biodiversity in which changes in one of these dimensions frequently lead to changes in the other (Maffi & Woodley, 2007). For example, the impact of illegal mining and increasing urban employment on the diversification of livelihoods progressively diminishes fresh water fishing grounds and the practice of fresh water fishing, which may soon weaken this activity's status as an important element of local culture. In this sense, biodiversity represents the natural foundation for the development of cultural processes that give form to the local context and its diversity. Thus the way that Afro-Colombian communities in the Pacific region control biodiversity and water is intrinsically tied to local culture and directly influenced by it.

### **3.2 The governance of Biodiversity and the role of Culture**

The governance of biodiversity and water appears as an institutional interface between the social and ecological subsystems, and entails a set of formal and informal statements, regulatory frameworks, behaviors, organizational modalities, mechanisms, and actions for decision-making around the management of activities related to livelihoods. This interface regulates a reticular structure composed of nodes, which in turn are made up of public, private, and mixed public-private actors and organizations. Links or relations among the nodes allow concepts, decisions, arrangements for collective action, and conflicts that influence the governance of biodiversity and water to flow or be coordinated or exchanged. (Folke, et al., 2007; Pavola, Gouldson & Kluvánková-Oravska, 2009; Ortíz, et al., 2014).

Thus we can understand the GS of biodiversity and water as a reticular mechanism that represents the institutional form in which actors in a particular territory distribute power for managing biodiversity and water, for resolving conflicts, and for managing the flow of natural resources and ecosystemic services related to livelihoods. This concept of management includes institutional arrangements to promote the coordination of local decision-making with decision-making at other levels of power and produces a set of practices that influence the maintenance of resources, the sustainability of their social and ecological dynamics, and their deterioration over time (Garmestani & Harm, 2013; Hughes, et al 2005).

For these reasons, the structures of GSs include multiple levels determined by the positions of actors. In the case under study we can group the actors into three levels: a macro level that includes national and international nodes, a meso (intermediate) or regional level, and a local or micro level. These levels are described in detail in section 5. In this sense, a GS links the local cultural domain, or the set of institutions and ways of understanding and relating to biodiversity historically established in the SES framework, with other cultural domains represented in the other nodes participating in the GS and that can be located at any level, but do not necessarily belong to the local cultural domain.

GSs of biodiversity and water link both cultural domains and actors that participate in their structures at the micro, meso, and macro levels. Local culture, though, will fundamentally affect the micro level, from which it will act as a prism, refracting information emanating from the meso and macro levels.

A key problem that emanates from the structure of the governance of biodiversity relates to the coordination of the networks of actors, who manage their interests influenced by their cultural domain. Therefore, the challenge is to control the political processes that take place in these networks, since the complexity of modern society requires avoiding centralized power (Rhodes, 1996). For this reason, the management of collective problems related to biodiversity and water is not always harmonious. On the contrary, it could result in a blockage decision-making since the outcome is an “antagonistic cooperation” when networks are not adequately coordinated (Mayntz, 2000; Kooiman, 2005). The governance of biodiversity is not an endpoint but a dynamic process, as a result of which GSs evolve and adapt to circumstances, generating positive or negative effects depending on the characteristics of the actors, their positions at the different levels and specific niches where power resides, and the predominant dynamic that emerges from relationships among them.

#### **4 Methodology and Case Study Description**

The methodology of the study involved three phases developed over the course of three years of work (Delgado et al., 2013). In the first phase, the SESs of the zone under study were characterized on the basis of the institutional framework for analysis developed by Ostrom (2009) (The results can be consulted in Farah, et al., 2012). The second phase included the identification of the most relevant variables that characterize the dynamics of these socio-ecological systems using prospective structural analysis (PSA) (Avendaño-Uribe, et al., 2013). The third phase focused on the analysis of the GS of biodiversity and water and the forms in

which it could respond to potential changes in the future, utilizing scenario analysis (Farah et al., 2014). Various methodological tools were used during this process, including surveys, interviews, workshops, and focal groups, a review of the literature, analysis of social networks and ongoing observation of socioeconomic dynamics in the field. The entire process was participatory and included the various stakeholders in active roles. Local communities played an important role, especially in the data collection process, which included among other things the conformation of a group of 25 "co-researchers" made up of women and men from both Community Councils, who were trained in relevant concepts and methodologies for SES governance and community management (Farah et al., 2012).

#### 4.1 Case study description

The analysis of GSs of biodiversity and water was carried out for the territory of the Community Council of Alto y Medio Dagua (AMDA) and the Community Council of Bajo Calima in the Dagua and Calima river basins, respectively, in rural areas of the special district of Buenaventura in the Department of Valle del Cauca, Colombia. Taken together, the area covered by these councils comprises 860 km<sup>2</sup>, representing 13.65% of the district's 6,297 km<sup>2</sup>.

This area is governed under a special legal framework due to its high level of biodiversity (Arbeláez-Cortés, 2013) including tropical rainforest (TR) ecosystems and a predominately Afro-Colombian population living along the rivers. In national terms they belong to an ethnic minority, one of those that have enjoyed collective territorial rights since the adoption of the 1991 Constitution. These rights in relation to the ownership and custody of land are regulated by Law 70 of 1993, which recognizes to afro-colombian communities the occupation and the right to collective property on wastelands in rural areas of Pacific Ocean's basins, according to their traditional productive and management practices (Farah, et al., 2012). In order to exercise these rights, the communities organized civilian ethno-territorial institutions called Community Councils - CC, which enjoy political and legal autonomy for the administration of their territories (Law 70, 1993). In exchange, Community Councils acquire a social and ecological responsibility on their territories and need to guarantee a sustainable management of natural resources.

The livelihood of people in the communities of the CCs can be understood as the set of existing practices undertaken to guarantee the survival of the social group (Chambers & Conway, 1992; Scoones, 2009). In the development of this livelihood, the local cultural domain is supported by biodiversity, through the selection and use of plants and animals and the establishment of agro-ecosystems that result in socio-ecologically productive natural environments (Milton, 1999; Bergamini, et al., 2013). Livelihoods are based on practices that materially support the households in the region and include activities such as the logging and non-timber forest products extraction, agriculture, mining, hunting, and small-scale fishing (See Figure 1). None of these activities is sufficient to guarantee necessary household income. Because of this family members engage in them at certain times of the year along with other activities such as selling their workforce in the urban sector of the municipality and on infrastructure construction or modernization projects. Tourism has become an alternative



source of income in recent years, due to the region's forests, rivers, and biodiversity. Communities participate in the tourist trade by commercializing traditional food products and selling their artisanal crafts. Agricultural activities usually cover the basic nutritional needs of households and only the surplus is sold in local markets. Most mining and forest products are sold on regional markets. And finally, family members living outside the municipality send resources to complement family income (Farah, et al., 2012).

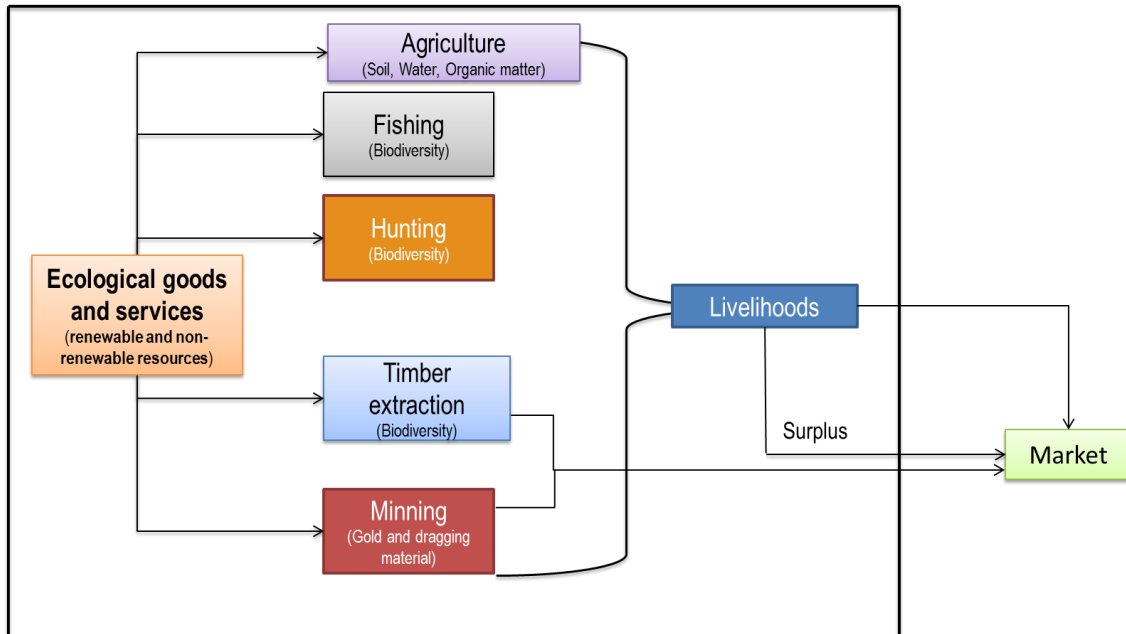


Figure 1. Productive-extractive systems in the territories of the studied Afro-Colombian communities.

The above activities are supervised by the CCs, which promote the conservation of biodiversity and water through the protection and strengthening of traditional and ancestral production practices and the sustainable use and management of timber and non-timber forest products, the latter of which are closely tied to traditional and ancestral medicine (CC-AMDA, 2007).

## 5 Results (The structure of governance of biodiversity and water)

The institutional structure of a GS can be understood as a normative system governing behavior and interactions among human beings and between human beings and natural resources (Ostrom, 2011). In the CCs, this relation takes the form of an institutional system that regulates property and access to resources used in common (e.g. forests and fishing areas) at two levels, one collective and the other operational (i.e. individual actions). This regulatory system, also known as a tenancy system (Turner & Berkes, 2006), defines the ways actors relate among themselves, the way they relate to biodiversity, and the structure of their rights to access and use the latter. This structure is the backbone of the biodiversity and water GS, which includes three levels, determined by the position of the actors. They are the macro level, made up of national and international nodes, an intermediate or regional level, and a

micro or local level. Figure 2 illustrates the schematic manner in which the collective decision making and operational levels relate to the macro, meso, and micro contexts.

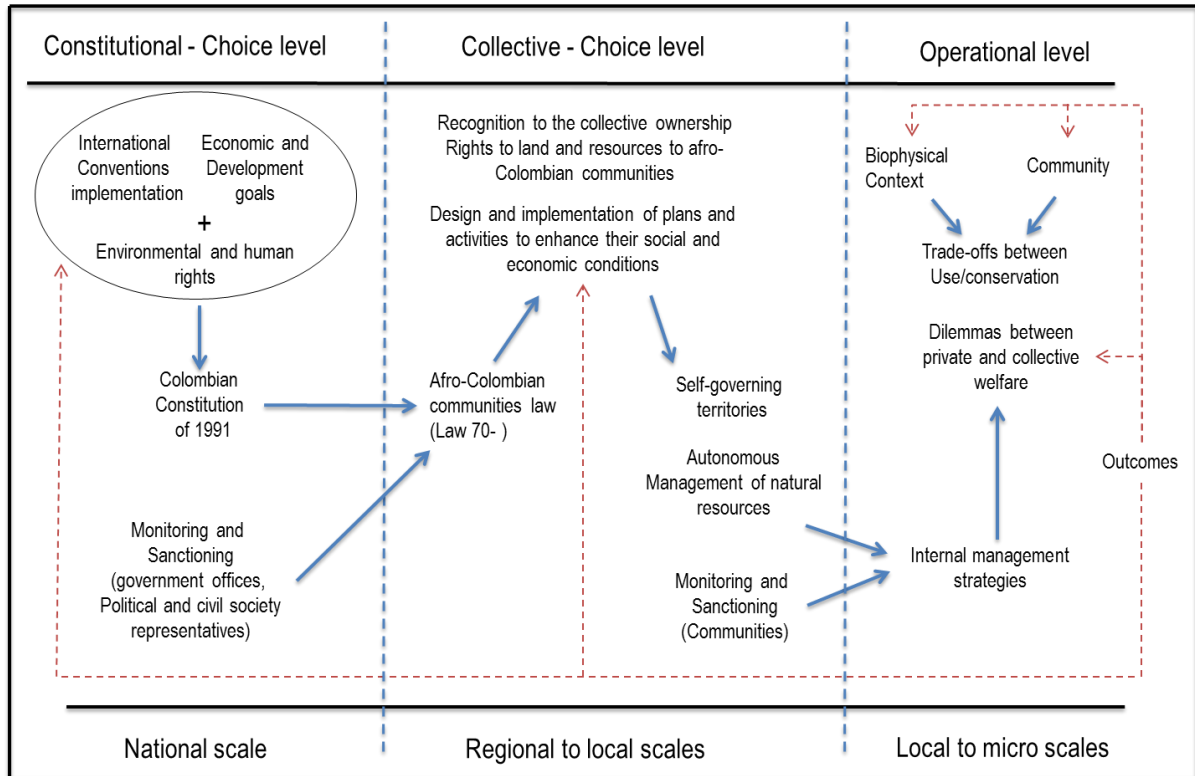


Figure 2. The institutional structure and its different levels. Based on Ostrom (2005).

In the following sub-sections we will describe these levels and the collective and operational dynamics that they reflect.

### 5.1 The macro level

There are twenty three national-level legal statements (laws, decrees and policies) at this first level (Ocampo-Díaz, 2013), which support the existence of collective territories for Afro-Colombian communities (see Annex 1). This legislation legitimizes the rights of local actors on their territory and affects the micro level by defining the way CCs relate to any external actor and the standards for access to the territory by external actors. This set of standards also influences the form and functions of the biodiversity and water GS by establishing first a legal framework to regulate decision-making, then public policies to be implemented by government bodies, and finally the possibility of intervention in the territories of CCs by private and mixed entities.

This extensive body of legislation results from a relatively rapid process in which the institutional framework relating to the natural environment was transformed. Before the 1990s, national responsibility for environmental management was not centrally coordinated; rather it was delegated to multiple entities (Tobasura Acuña, 2006). Environmental



management in rural areas at that time was primarily the responsibility of the National Institute of Natural Resources (Instituto Nacional de Recursos Naturales) of the Ministry of Agriculture, while environmental management in urban areas was exercised by the Ministry of Health or by Municipal Public Enterprises (Empresas Públicas Municipales - EPM), which were extremely limited in their capacity to carry out the environmental functions assigned to them (Tobasura, 2006). In addition, the Ministry of Mines and Energy exercised environmental authority in mining areas. Non-governmental Organizations (NGOs) also took on certain responsibilities for environmental management after 1970, as communities lacked the mechanisms necessary to participate in decision-making over matters that affected environmental quality in the areas they inhabit (Tobasura, 2006).

There was an ambitious reform of environmental policy in the 1990s, beginning with environmental provisions in the 1991 Constitution, including the incorporation of instruments and mechanisms for the participation of civil society in environmental management and in the defense of natural resources and the environment (Tobasura, 2006). The most notable instruments provided by the Constitution were the “previous consultation”<sup>2</sup> of minority communities (indigenous, black, and island dwellers), the availability of a legal instrument known as the *tutela* (a writ for the protection of fundamental rights) and other instruments such as those established to defend the right of citizens to a healthy environment (Rodríguez, 2003). Over time, changes to the Constitution also allowed courts (the Constitutional Court, the Supreme Court, and the Council of State) to become key actors in the defense of the nation’s environmental heritage and the defense of institutions dedicated to environmental protection.

The transformations that began with the 1991 Constitution opened a path to the decentralization of national environmental management. In this context, and influenced by the 1992 Rio Declaration on Environment and Development—especially Agenda 21—Law 99 of 1993 laid the groundwork for the establishment of the National Environmental System (*Sistema Nacional Ambiental – SINA*) within the Ministry of the Environment. SINA is responsible for coordinating public policy on renewable natural resources and the environment in order to assure sustainable development, execute the National Environmental Policy, and operate the Environmental Information System. Along with SINA, five other institutions were established for the purpose of conducting research and generating technical information related to the natural environment. Three of these institutions operate in the region under study: the Alexander von Humboldt Research Institute (*Instituto de Investigación Alexander von Humboldt – IAVH*), the Institute of Environmental Research and Meteorology (*Instituto de Estudios Ambientales y Meteorología – IDEAM*), and the Environmental Research Institute of the Pacific (*Instituto de Investigaciones Ambientales del Pacífico – IIAP*). The National Environmental Council (*Consejo Nacional Ambiental - CNA*) was also established within SINA and is in charge of promoting active cooperation between the public and private sectors in the area of environmental plans and programs through the participation of

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<sup>2</sup> Translation for the original term in Spanish “*Consulta Previa*”.

ministries, private businesses, ethnic groups, NGOs, universities, and the Council on Higher Education (*Consejo de Educación Superior - CESU*), among other entities.

Likewise, the National Planning Department (*Departamento Nacional de Planeación – DNP*) works closely with entities under the SINA umbrella in fulfilling its responsibilities to prepare, monitor, and evaluate policies, general plans, and public sector programs and projects. Other entities within the SINA framework and under the Ministry of the Environment also include the Regional Autonomous Corporations (*Corporaciones Autónomas Regionales –CARs*), whose after Law 99 are in charge of executing policies, plans, programs, and projects relating to the environment and renewable natural resources. These are the maximum regional environmental authorities in the areas of their jurisdiction. In the area under study the Regional Autonomous Corporation of Valle del Cauca (*Corporación Autónoma Regional del Valle del Cauca – CVC*) and the Technical Environmental Directorate (*Dirección Técnica Ambiental*) of the municipality of Buenaventura carry out these functions. The work of SINA is subject to oversight by the Office of the General Controller (*Contraloría General de la República*), the country's most important control mechanism, specifically the Delegate Controller for the Environment (*Contraloría Delegada para el Medio Ambiente*).

Current institutions and laws with respect to biodiversity and water management are also influenced by a number of international agreements. In 1994, for example, Colombia became party to the Convention on Biological Diversity through its Law 165, which was later the basis for the 1996 National Biodiversity Policy which committed the State to establish and consolidate a National System of Protected Areas (*Sistema Nacional de Áreas Protegidas – SINAP*), adding a new set of actors and regulations to the institutional panorama of environmental management in the region under study. The Special Administrative Unit called National Natural Parks of Colombia was established in 2011 through Decree 3572. Also in the 1990s, the country ratified the Climate Change and Basel conventions, the Copenhagen Amendment to the Montreal Protocol, the convention associated with the Inter-American Institute for Global Change Research (IAI), and the Protocol Concerning Specially Protected Areas and Wildlife of the Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (WCR).

The Mining Code was also promulgated in 2001 (Law 685 of that year), which together with the Guidelines for a National Sustainable Development Policy issued by the National Council on Economic and Social Policy (Document 3343 of 2005), set forth guidelines and strategies for sustainable development in the water, environment, and territorial development sectors, along with the General Law on Forests (Law 1021 of 2006). In recent years, Colombia has begun to take part in the Convention on Wetlands of International Importance, also called the Ramsar Convention, and approved the National Policy on the Comprehensive Management of Water Resources (2010) and the National Policy for the Comprehensive Management of Biodiversity and its Ecosystemic Services (2012), and established the National Authority on Environmental Licenses (2011). These actions represent the most important steps in establishing national environmental policy.

It should be noted that Colombian environmental institutions continue to evolve. By virtue of Decree 216 of 2003, for example, the Ministry of the Environment was renamed the Ministry

of the Environment, Housing, and Territorial Development, and took on the additional responsibilities and practices implied by this name change. An additional transformation was indicated by Law 1444 of 2011, when the current name and responsibilities of the ministry were adopted: the Ministry of the Environment and Sustainable Development.

## 5.2 The meso level

The second level of the GS is regional. This is the level where collective regulations or those established collectively to regulate interactions between different actors for the use and management of natural resources. In the CCs, the General Assembly and the Board establish the form in which natural resources should be used, managed, and protected. The primary collective regulation is the conformation of the General Assembly (which includes all members of the CC's community) and the selection of its representatives (Board and Legal Representative) according to Law 70 of 1993. In the General Assembly, the regulations are established collectively through voting and then are executed by the leaders in the context of the CC. These collectively established regulations fall into three groups:

1. Prohibited and illegal activities: those that generate negative impacts in social, economic, and environmental terms that can not be compensated for. The most significant activities within this group are the cultivation of illegal crops, fishing with poison or explosives, large-scale or unauthorized sale of timber, activities leading to significant change in the conditions of the natural environment, water sources or riverbanks, and the extraction of genetic resources.
2. Activities that should be widely discussed: those that may generate (negative or positive) effects for communities through their establishment, execution, or continuation. These activities include projects related to infrastructure, extensive productive systems, and research.
3. Activities that should be promoted and strengthened: those with significant cultural and ecological value. These activities include the sustainable harvesting of forest products, small-scale mining and fishing, sustainable agriculture, reforestation, and the cultivation of exotic flowers. The CCs have territorial and natural resource management plans to promote and formalize these traditional activities.

Outside actors and institutions interested in participating in activities within the territory must be invited by community members, ask for permission from local leaders and the Legal Representative, or hold explicit authority to implement and watch for public policy.

In the case under study, the meso or regional level also includes a diverse group of formal institutions including the Technical Environmental Directorate (Dirección Técnica Ambiental) of the municipality of Buenaventura, the Regional Autonomous Corporation of Valle del Cauca (Corporación Autónoma Regional del Valle del Cauca – CVC), the Institute for Environmental Investigations of the Pacific (Instituto de Investigaciones Ambientales del

Pacífico – IIAP) and some NGOs with regional sections such as the World Wildlife Federation - WWF. These entities and organizations work at the regional level but focus their work in different areas of interest depending on their own institutional missions. These different interests make inter-institutional coordination difficult and increase the time and money necessary to conform to the environmental management promoted by the CCs.

The work of the CVC and that of the district of Buenaventura stand out among this group of entities and organizations. The CVC is the principal regional environmental authority, whose responsibilities include administering the natural environment and renewable natural resources to promote their sustainable development in the department of Valle del Cauca. For administrative reasons, the CVC has divided the department into five Regional Directorates, each of which has its own divisions dedicated to work in particular river basins. The CCs in the area under study are under the jurisdiction of the Regional Environmental Directorate for the West Pacific (Dirección Ambiental Regional Pacífico Oeste), which is responsible for the needs of the community of Buenaventura. As an environmental authority, the CVC has been criticized for weaknesses including problems of coordination with the Ministry of the Environment, irregularities in its internal governance and finances, and indications that it has lost sight of its intended characteristics and focus (Canal & Rodríguez Becerra, 2008).

The district of Buenaventura deals with environmental programs and policies through its Technical Environmental Directorate. This institution faces the challenges of environmental administration in a municipality where all efforts are directed toward protecting and improving the operation of the country's most important seaport, the Port of Buenaventura. These efforts take the form of multiple megaprojects that include the widening of highways that connect the city and the port with the rest of the country, the construction of oil pipelines, river ports, and high-voltage power lines. This has meant that most of the municipality's needs not relating to port activities have been ignored by the district government and national policy.

Though the Technical Environmental Directorate mostly works in the urban area of the district, its area of responsibility is legally defined as the area within the political-administrative boundaries of the municipality. This makes for overlapping jurisdictions that sometimes generate conflicts when coordinating activities. The work of the Technical Environmental Directorate in the rural areas of the municipality has been sporadic and irregular, and responsibility for environmental management in this part of Buenaventura primarily falls to the CCs and when police intervention is indicated, to the CVC.

In addition, corruption in public and private institutions of the region (Corporación Transparencia por Colombia, 2006) makes it difficult for public institutions to fulfill their missions and impacts GS as an obstacle to transparent coordination, collaboration, and management of the environment.

A varied group of private productive units also participates at this level, sometimes providing services but primarily engaged in activities related to the extraction, processing, and marketing of natural resources. Some of these productive units operate illicitly, such as those engaged in the illegal extraction of timber and the production of cocaine. Likewise, there are

mixed public-private institutions including the Port of Buenaventura. This group of institutions makes up an active part of the GS, carrying out its activities under the influence of actions carried out and regulations established by public bodies and by the CCs.

### 5.3 The micro level

This level is made up of operational regulations and local actors who sometimes act in their own name and some others as representatives of higher-level institutions.

Operational rules are established to regulate daily decisions; therefore, they are more dynamic and can change relatively faster than those established at the previous two levels (Ostrom, 2005). These rules are used to solve questions related to the “whom”, “how”, “when” and “where” in terms of natural resource management. These rules may be formally written or result from informal and customary agreements; also, they are nested in rules from the previously described levels. In Colombian Case Study, these operational rules can be divided into two groups: (1) the formal rules concerning overall outlines of natural resource management; and (2) unwritten (informal) rules based on traditional culture and practices, which become mostly relevant at the local level. Cultural practices are those that have historically determined the ways in which local actors utilize biodiversity and water and establish plans for the effective use of these resources for the benefit of the community. This reflects the intrinsic relationship between biodiversity and culture at the local level.

At the micro level of the GS, the central actors are the members of the community, who organize themselves into rural neighborhood committees, which is to say voluntary associations that support the CC Board. These committees join forces to meet the community’s needs and solve its conflicts, as well as to promote citizen participation and represent their rural neighborhoods’ interests at the Board meetings. Within the assembly, other groups known as committees of assistance are also formed; these committees take responsibility for specific matters in the community and are represented by a coordinator who becomes their spokesperson at Board meetings (CC-Bajo Calima, 2008). Community Councils, on the other hand, operate on the basis of formal documents such as the Ethno-development Plan and the Internal Bylaw and Management Plans, documents that contain the community’s own system of standards and regulations for the effective management and control of natural resource use, particularly in terms of extractive activities (fishing, fauna, timber, and other forest products) and territorially-based productive activities (agriculture, mining, tourism, and services) (CC-AMDA, 2007; CC-Bajo Calima, 2008). The theoretical grounds of these documents are traditional and ancestral territorial management concepts, which reaffirm the local culture.

At the micro level of GS, representatives of non-governmental, academic and state organizations interact along with representatives of the community associations that support and accompany the Community Councils in their projects and activities. These associations support the generation of knowledge by means of research and studies that provide basic technical and scientific information for decision-making on issues regarding natural resources. This type of assistance remains as vital for the intercommunication of Community Councils

with external entities and organizations. Some non-governmental organizations also accompany social processes of the Community Councils, promoting organizational strengthening processes and participating in social control and political processes in the collective territories (See Figure 3).

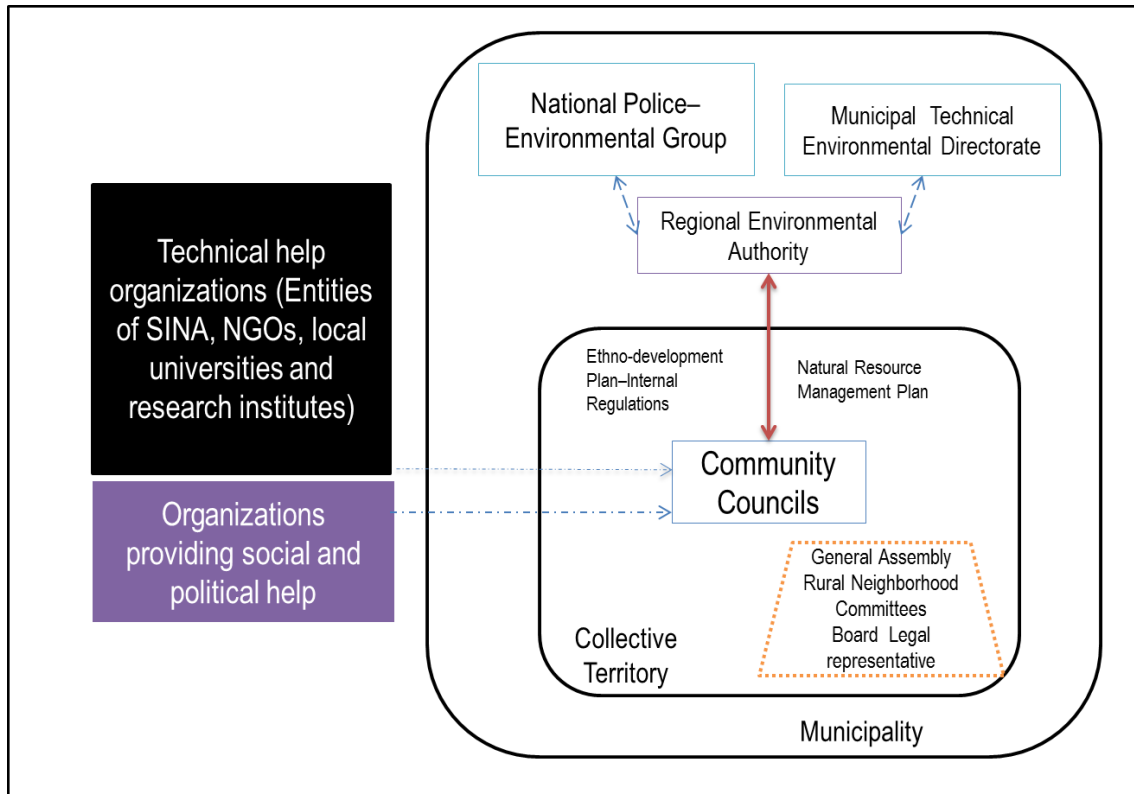


Figure 3. Micro-structural level of the Governance system of the Community Councils.

At the same time, informal statements or institutions seek to create order and increase predictability among human beings who share resources and use them for common purposes (Ostrom, 2005). This is the case of the Community Councils, whose informal statements are tied to cultural aspects of natural resource use and management. Communities recognize these codes and take it upon themselves to see that they are respected. It must be said, however, that there are strong family ties among some members of these councils, which complicates the objective control of activities and the application of rigorous corrective mechanisms.

Informal statements are subject to multiple interpretations that lead to correspondingly varied forms of application (Ostrom, 2005, 2011, 2013). In the area under study, the CCs have reinterpreted the law in the light of their own culture. The many possible interpretations of institutional statements sometimes make it difficult to coordinate local policies with actions and policies stemming from the meso and macro levels of the governance system (See Figure 4). At micro level, policies are influenced by the dominant local culture, which permeates management plans, ethno-development, and internal regulations. Within the overall structure, this is the point where the gap between macro policy and actual practice widens.

The dynamics of mutual influence and interpretation permeate the relations established among a heterogeneous set of actors. They are expressed through the multiplicity of activities relating to the use and management of territory and existing cultural expressions and mediations, leading to the configuration of varied micro-structures presented below.

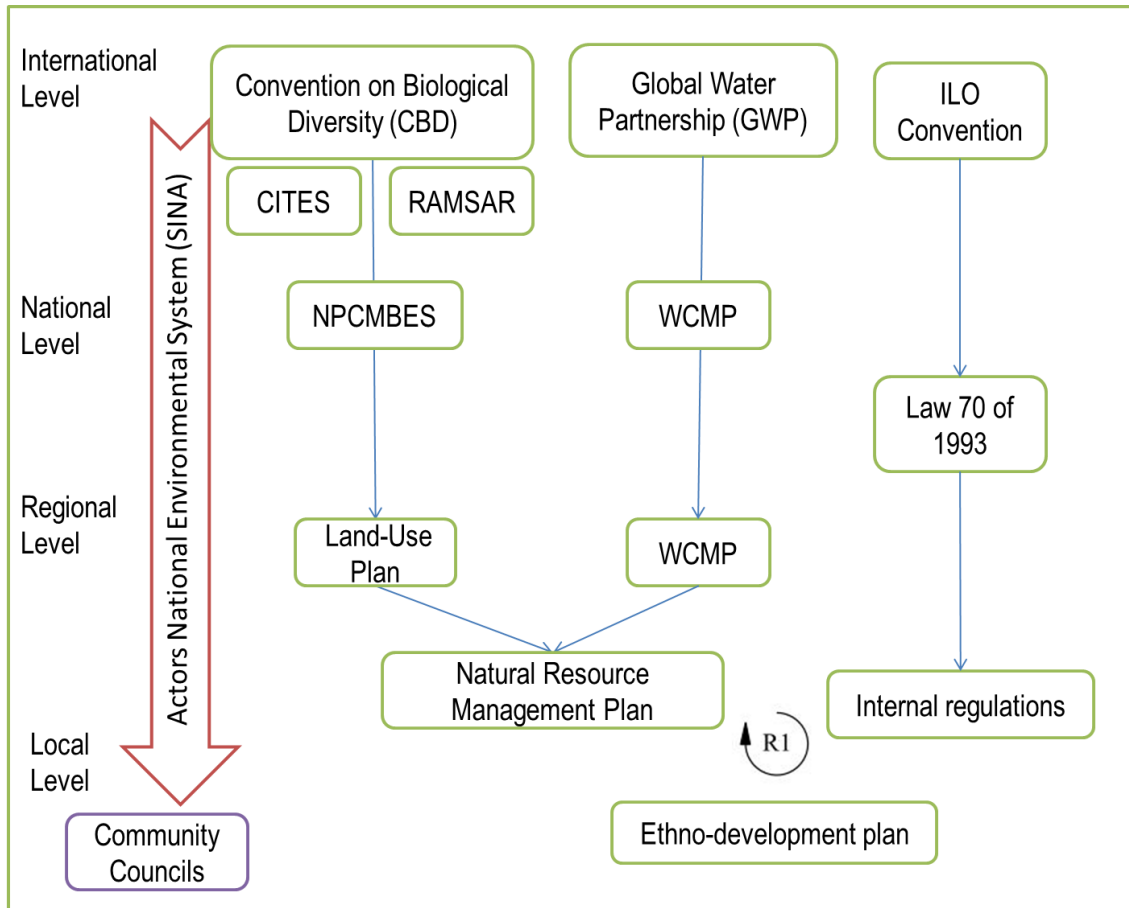


Figure 4. Hierarchical influence of public policy on the governance of natural resources (water and biodiversity) in Community Councils.

### 5.3.1 Micro-structure for the fishing and hunting system

Fishing is practiced by the members of the Community Council with handcrafted tools including fish traps, hooks, casting nets, and purse-seine nets, among others (CC-AMDA, 2007). The most demanded resources are river shrimp (*Macrobrachium* sp.) and several fish species including "sábalo" (*Brycon melanopterus*) and the common snook (*Centropomus undecimalis*). These species are used for both home consumption and sold, in the latter case through intermediaries that regulate demand (CC-AMDA, 2007; CC-Bajo Calima, 2008).



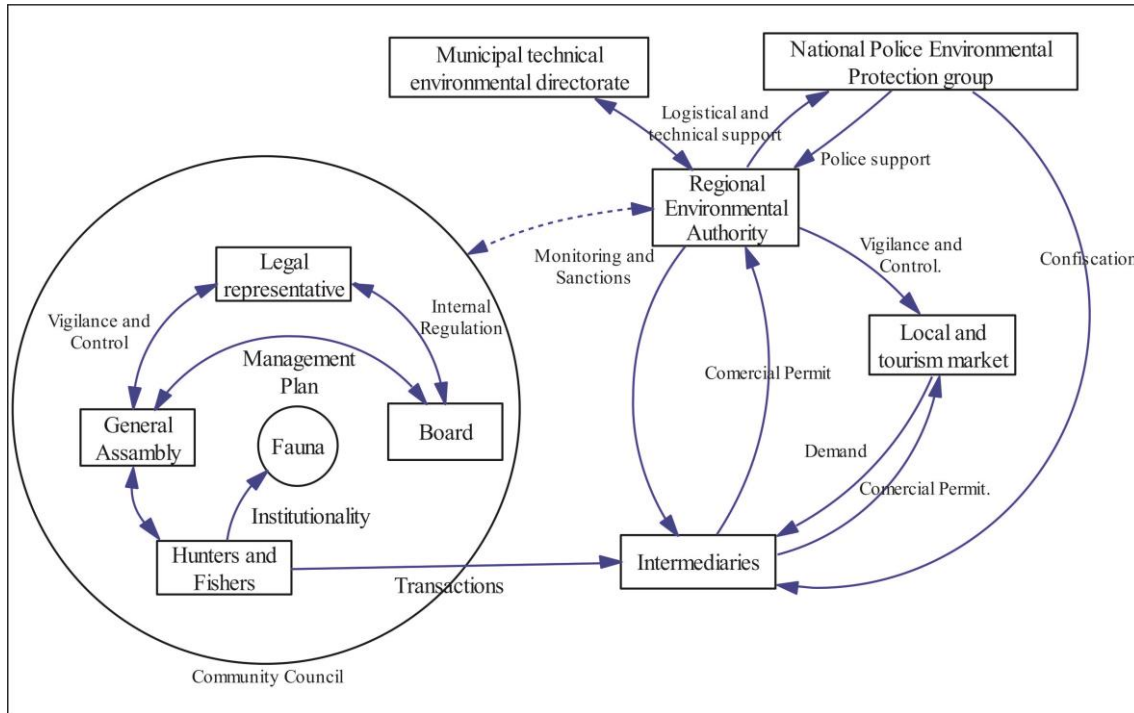


Figure 5. Micro-structure of the fishing and hunting system.

Fishing is practiced seasonally according to the ecological dynamics of the river and to the socio-cultural and economic processes that take place in the territory. Some of the seasons where there is a high demand for this resource coincide with the touristic season or religious celebrations such as Holy Week and Three Kings Day. At these times, this resource is intensely exploited and the fishing traditions are remarked (CC-AMDA, 2007; CC-Bajo Calima, 2008). The community monitors and controls fishing informally; in cases of overfishing or fishing by non-traditional means considered illegal—with dynamite for example—the Board of the Community Council imposes a pedagogical or corrective exercise<sup>3</sup> on infringers. If an objectionable activity is repeated, infractors are reported to regional bodies such as environmental authorities (CVC) and/or the National Police, who will impose legally established sanctions such as fines and confiscations.

The hunting of animals such as pacaranas (*Dinomys sp.*), acouchis (*Myoprocta pratti*), collared peccaries (*Pecari tajacu*), white-lipped peccaries (*Tayassu albirostris*), and armadillos (*Dasypus novemcinctus*) can be practiced only using traditional means, and unlike fishing, hunting cannot be practiced commercially (CC-AMDA, 2007; CC-Bajo Calima, 2008). While this activity is controlled by the community in general, the regional environmental authority must apply sanctions for violations and apply conservation strategies. Other actors such as the Technical Environmental Directorate, the National Police’s environmental group, the National Tax and Customs Directorate, and the Colombian Agricultural Institute also respond to illegal

<sup>3</sup> In other words, the Community Councils seek for agreements, consensus and awareness rather than applying infringements or punishments.



trafficking in the zone, in conformity with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

### 5.3.2 Micro-structure for the forest system

Many different actors use forest resources, and they do so in a variety of ways for both domestic and commercial purposes. Any extraction of forest resources on collective territory requires prior planning documents indicating where the extraction will take place, the quantity of the product to be extracted, and the intended purpose of the extraction. When the extraction is intended to satisfy the needs of an individual or family of the Community Council, informed consent and planning documents are presented to the Board of the CC.

If the extraction of timber is intended for commercial purposes, it is necessary to request a special permission (called *salvoconducto*) from the regional environmental authority (CVC) in addition to informed consent from the Board of the Community Council. This permission is the document that legally authorizes the transport and sale of timber. It also establishes and authorizes specific conditions for commercial forest activities and serves as a permit for the extraction of forest products. If these legal requirements are not met, environmental authorities must confiscate the material with the support of the National Police.

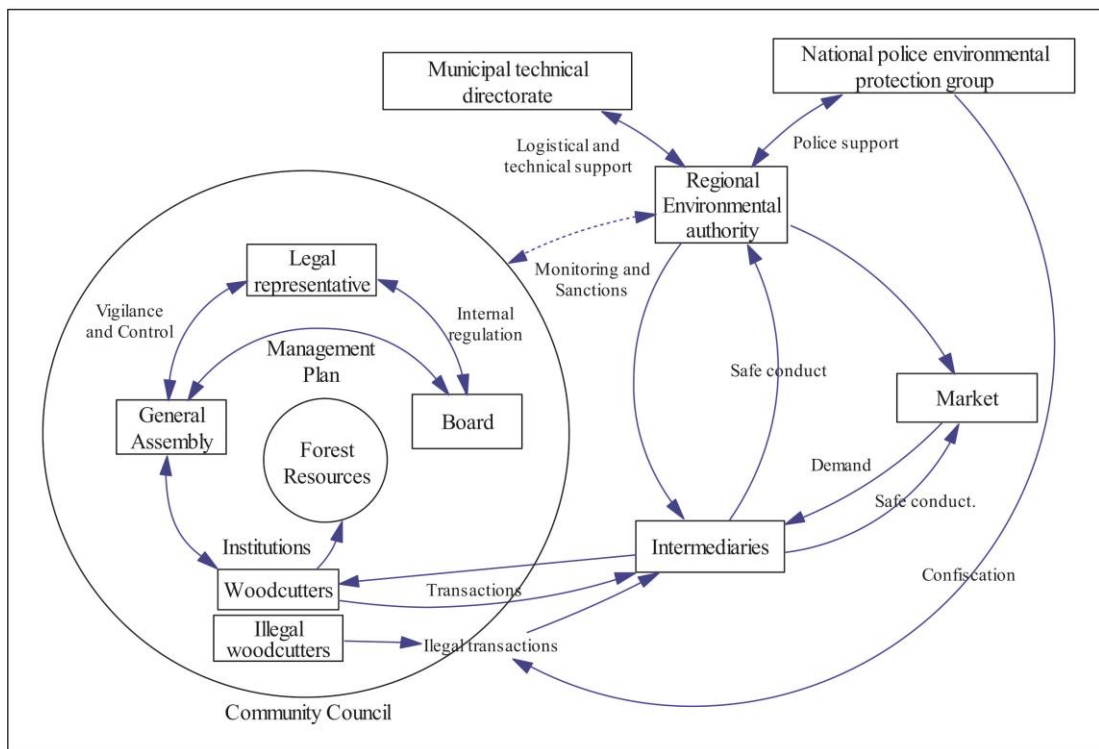


Figure 6. Micro-structure for forest system.

It is prohibited for non-members of the community to remove plants from the jurisdiction or to indiscriminately cut down immature trees just by notifying it "informally" to someone in the community. The Community Council is responsible for monitoring and imposing sanctions

for these activities. In most cases, penalties are strictly pedagogical since CC policy is to protect natural resources with corrective actions before resorting to police action.

### 5.3.3 Micro-structure for the extraction of gold resources (mining)

In Colombia, the Ministry of Mines and Energy issues communities associated with Community Councils a special license for non-renewable natural resource exploration and extraction by artisanal methods (with the exception of coal, radioactive minerals, salts, and hydrocarbons) while preventing and controlling environmental degradation (Law 70, 1993, Art. 7). For this reason, communities maintain mechanisms of control over small-scale mining, exercised by the General Assembly and the Board. It is true, however, that sometimes community members engage in illegal activities (such as mechanized gold extraction) as a source of additional income, and it is difficult to control illegal mining activity due to family ties within the Council. When mechanisms and controls exercised by the Board turn out to be insufficient, the National Police and the regional environmental authority are notified in order to impose sanctions on those engaged in illegal mining activity or remove them from the area of that activity.

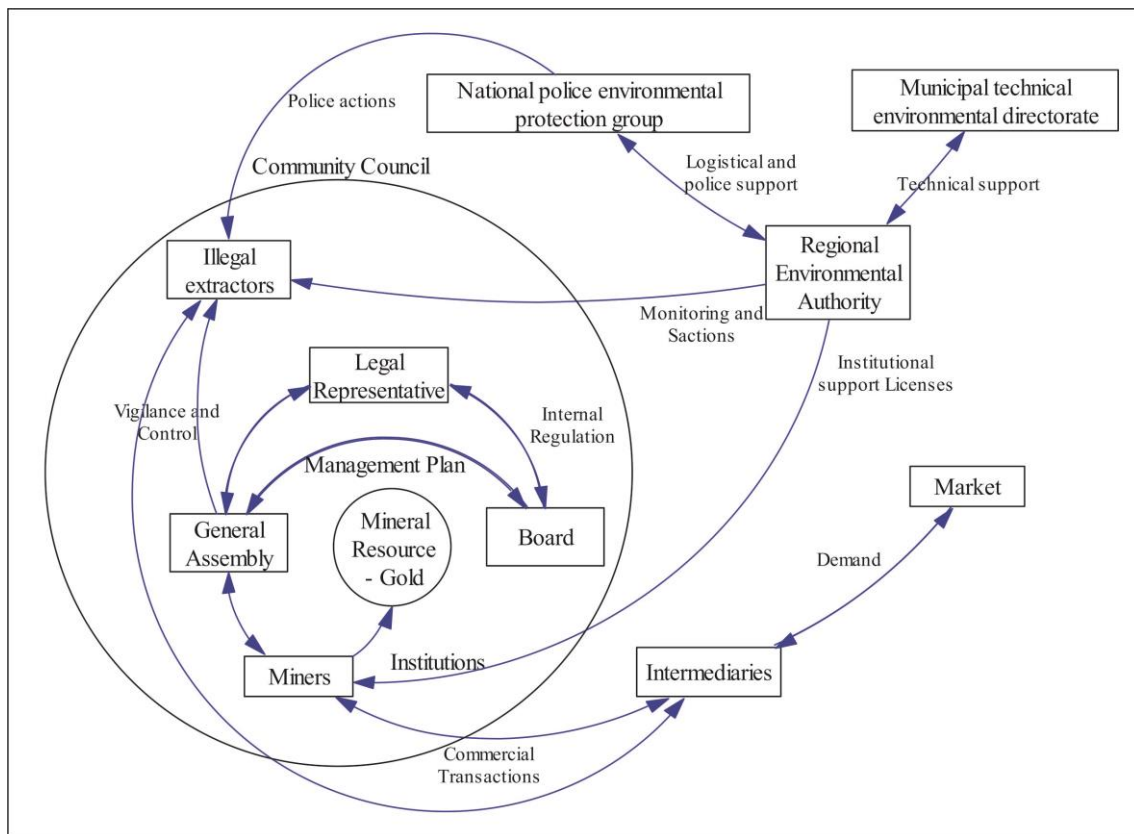


Figure 7. Governance system micro-structure for mining resources (Alluvial gold mining).

Although mining takes place throughout the year, demand for gold increases in October, November and December (probably due to the festivities celebrated at the end of the year), and miners move to the river bays located deep into the forest to carry out their activities

without let-up during those months. The grams of gold extracted are sold to an intermediary, generally not a member of the community, who will transport the mineral for sale to commercial buyers in the city of Buenaventura (CC-AMDA, 2007).

#### 5.3.4 Micro-structure for the management of agro-biodiversity

In the case of agro-biodiversity, the system is based on the management of agro-ecosystems that generally combine a cultivated component and a forested component. Agriculture is practiced throughout the year in family production units on elevated platforms called "azoteas" or on small parcels (depending on the crop), which facilitates governance because it is practiced individually or by families.

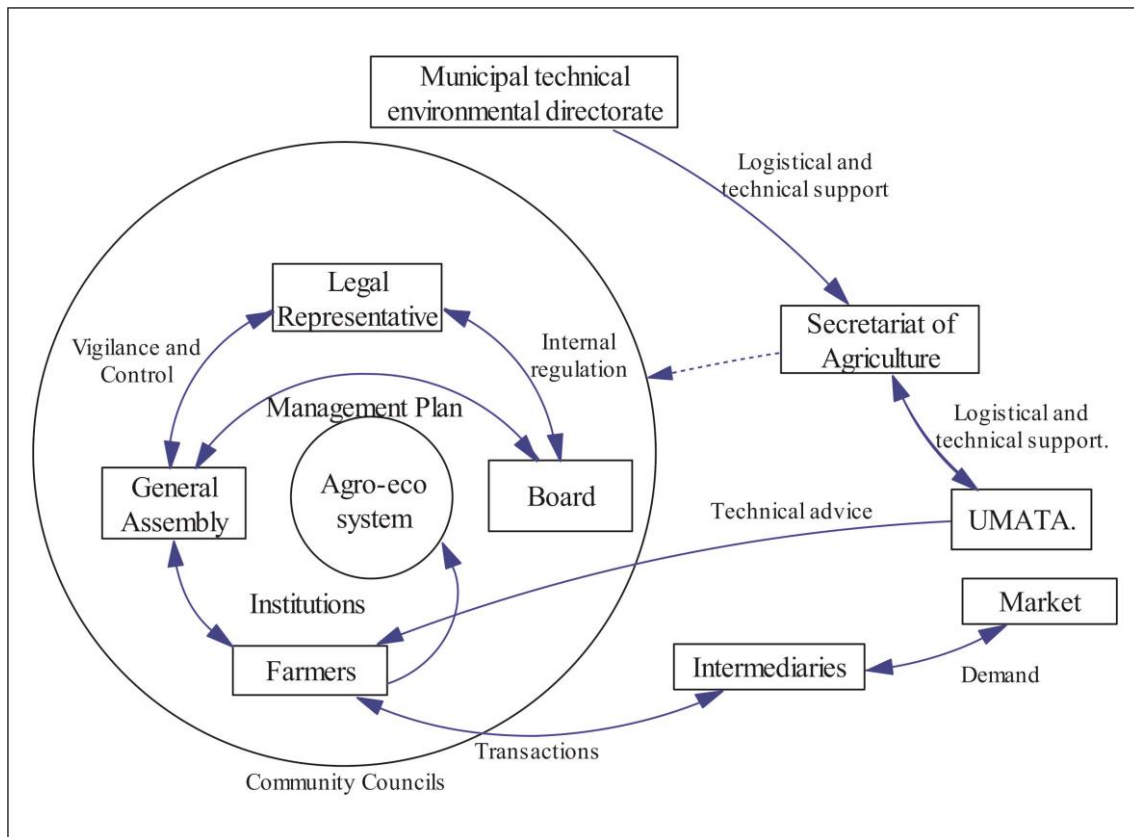


Figure 8. Micro-structure system for the governance of agro-biodiversity.

Most of this production is intended for self-consumption and is carried out using traditional methods, i.e. without the use of machinery. When the products from agriculture are sold, this process is generally made through intermediaries who take demand, prices, transportation costs, and other market dynamics into consideration. Agricultural inputs used in this activity are often provided by the Ministry of Agriculture and Rural Development through the Municipal Technical Assistance Units for Agriculture (*Unidades Municipales de Asistencia Técnica Agropecuaria – UMATA*), which communicate directly with each agricultural producer.

## 6 Analysis of the results

The analysis of the GS of biodiversity and water reveals a structure that can be described as consisting of three levels. At the national level, human intervention in the natural world is planned in accordance with national economic interests and relates to development objectives for the country as a whole. At this level, affected populations and investments are identified. A first consultative space is also found at this level in which high-level representatives of Afro-Colombian communities participate. This does not necessarily mean, however, that there is grassroots participation. At the second level (the regional level), there are interactions between different institutions that act as intermediaries between the national and local levels. At this level, the municipal government of Buenaventura, the departmental government of Valle del Cauca, and especially the CVC serve as mediators between different perspectives representing the national economic and environmental agendas on the one hand, and the impacts on local communities that their execution may generate on the other. Finally, the local scale is where all negotiations are held, recognizing both local needs and national regulations. This level is extremely dynamic in terms of institutional change, and allows for cultural norms to find expression within wider designs for the protection of natural resources, which may also be modified as different projects are developed at the local level. This ongoing interaction between different levels of management and geographical levels, while not perfectly balanced or harmonious, has reinforced the idea that traditional structures of governance are efficient in the use of shared knowledge and social conflict as factors that strengthen the management of natural resources.

As a result, the biodiversity and water GS in the Colombian Pacific region has been developed at multiple levels, according to particular histories and geographies and equally particular configurations of actors. The structure of this GS has come out of a learning process and changes along the way—not always a linear or cumulative process. It has had its ups and downs, getting stronger at times and weaker at others, based on the combined influence of multiple internal and external factors including biophysical, economic, social, political, and technological circumstances. Both different levels of power and specific power centers have come and gone throughout this process, which has seen multiple reconfigurations of relations among actors and significant variability with respect to the level of power pertaining to each of them.

This dynamic of change has included the participation of government actors, a group as diverse as that of private or non-public actors. The many links between these groups have led to different influences on public policy for environmental management and for economic development. In addition, top-down policies do not emerge in the Colombian Pacific region in a homogeneous or transparent fashion. Instead, they depend on the actors that are present and their relations at a given time at the macro, meso, and micro levels of the GS. The characteristics of the structure itself and the characteristics of the actors and institutions that make it up—local culture in particular—act as prisms that affect the flow of information between different levels by interpreting and refracting public policy, adopting its guidelines in keeping with their own nuanced interpretations.

Heterogeneous characteristics of the biodiversity and water GS are reflected in the way that some actors play more than one role in the structure, based on their capacity to participate in more than one arena or to participate in the decision-making process with respect to more than one natural resource.

The hierarchical structure of the Community Councils contrasts with the functionally weak activity of some external entities with respect to the management of natural resources. For this reason, these external entities have a limited and sometimes ineffective participation in vigilance and control. This leads to increased pressure on Community Councils and their leadership to strongly exercise their role as environmental authorities in the collective territory. For this reason, the biodiversity and water GS depends in the short term on local institutionality to guarantee the quality and availability of resources.

In this context, we can identify some of the challenges faced by the GS of biodiversity in collective territories. One of them is to achieve consonance between the elements of plans and regulations and the national and regional management policies, as well as international conventions. Another significant challenge is that the informal statements originated in the cultural domain, have different interpretations which distort the sense of the public policy on natural resources management. Finally, micro-structural relations found at the base of the governance system reflect not just relations among different actors, but also interpersonal relations that go beyond the strictly political administrative sphere. This can be observed in the difficulties that emerge during monitoring and control involving members of the same community who do not comply with formal or informal directives. While it is preferable a pedagogical approach to this kind of infraction, kinship relations among actors lead to insufficiently rigorous controls.

The description of the GSs of biodiversity and water in the context of the SESs administered by the Community Councils of Alto y Medio Dagua and Bajo Calima suggests the need to review and deepen the analysis of the assumptions in the literature on GSs and in particular to consider three key aspects that arise from this analysis:

1. GSs are not homogeneous structures subject to a process of linear change. On the contrary, their structure is frequently flexible and continually changing, since it depends on the context from which it emerges, and like history, it is constructed in keeping with a particular configuration of actors. Nor is the change process necessarily linear. It is subject to instabilities that may include abrupt changes resulting from biophysical or socioeconomic disturbances.
2. Evidence gathered for this analysis allows us to confirm that GSs are characterized by multiple levels within which diverse power centers are nested. But these multi-leveled and polycentric structures are far from stable. On the contrary, GSs are continually undergoing changes that generate strengthening and weakening of the system depending on multiple internal and external factors and on the configuration of actors participating in the structure, which in turn will determine the quality of relations among actors and the nature of the institutions that will predominate in the GS. Both levels and power centers may appear and disappear during this process. Though a

GS may have multiple levels and power centers, its flexibility and dynamics of change may permit reconfigurations of the relative positions of actors and active variability with respect to the degree of power wielded by each of them.

3. In this analysis we hold that government actors are as diverse as those from the private sphere and that problems of coordination between these groups have produced differentiated and even sometimes opposed influences with respect to public policy on environmental management and economic development. In addition, top-down policies are not transmitted in a uniform or transparent manner between levels. On the contrary, they are affected by the structure of GSs as they are transmitted between levels. The characteristics of the structure and of the actors and institutions that form part of a GS, the local culture in particular, function as prisms that interpret and refract policy decisions and either recast them as a result of interpretive nuances or reinterpret them entirely.

## **7 Conclusions and lessons learned**

The system of change and adaptation of biodiversity and water GSs is an ongoing and nonlinear process subject to sudden changes resulting from the impacts of internal and external factors and of their changing configurations. The analysis proposed in this document identifies some concrete implications that can be suggested to local organizations and decision makers so that both communities and scientists can participate in a more appropriate fashion within the framework of biodiversity and water GSs.

These implications relate to three challenges for the governance of biodiversity in the context of the Colombian Pacific region and other territories where there are models of governance of biodiversity and water based on community management structures. One of the most important challenges relates to the impacts generated by the process of development within biodiversity and water GSs. Many of the transformations identified in the GSs studied are directly tied to changes in institutional contexts and cultural dimensions in the region, for which reason they are difficult to correlate with changes in the natural environment as such (Weber et al., 2012). Thus public policy intervention is limited, as simultaneity and linkages between these transformations are not evident. For this reason, the understanding of biodiversity and water GSs is considered exclusive to the environmental authorities, unrelated to the analysis of regional development dynamics.

The second challenge relates to current mental models, which tend to interpret biodiversity and water GSs as balanced, benign, resilient, and homogeneous systems with an intrinsic capacity for reorganization (Gunderson et al., 1997). This makes difficult to identify lessons learned and communicate them to the sphere of environmental management.



Finally, another significant challenge is to make more flexible the vision that predominates today, at least in the Latin American context, of the structure of biodiversity and water governance systems. As part of this tendency the structure of GSs tends not to be recognized as a factor in the dynamics of public policy formation or alternatively to be seen as a homogeneous and rigid structure dependent on dynamics of top down governability.

Three other matters could be useful in GSs of biodiversity and water supported by communal structures:

1. It is important to differentiate the role played by local actors in the GS (local leaders, senior citizens, women, youth, etc.) depending on the confluence of individual interests, such as increasing income for example, with common interests like protecting the natural environment, and the role played in this framework by the management of information through traditional networks or contacts with government institutions, and the way this information is used to generate new dynamics of collective action. For example, leaders and conflict mediators are recognized for their work in favour of the community. The design of new strategies and programs, as well as the mobilization of collective action, requires of these actors' participation. This may have contradictory effects on the biodiversity and water GS. The positive effect is that, when these actors are in agreement with the initiatives, they can easily distribute information and motivate participation. The negative effect, on the other hand, is that due to matters relating to the relationship with local communities have to pass through these actors, processes take more time and more conflicts arise if they do not agree or if they have personal interests.
2. Change in governance systems includes different actors with divergent interests and different strategies for gaining access to and managing natural resources.
3. Social interactions at the local level are based on geographic proximity, without implying that this necessarily translates into shared management strategies. Nonetheless, this proximity and local actors' knowledge of their territory are important factors in the design of regulatory strategies.

Finally, it is important to stress that a detailed reading of the relation between biodiversity, culture and governance is key to understanding and interpreting the process by which biodiversity and water GSs change and adapt. Biodiversity should be understood not only as biological diversity but also as cultural biodiversity, and understanding the interrelation between the two allows for a broader and more contextualized understanding of the governance of biodiversity.

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# Annex I. National regulations related to the collective territory of Afro-Colombian communities

Law, decree, or policy	Contents
Law 22 of 1981	Approval of the International Convention on the Elimination of All Forms of Racial Discrimination, adopted by the General Assembly of the United Nations
Law 21 of 1991	Approval of Convention 169 - International Labor Organization (ILO)
Law 70 of 1993	Recognition of Black Communities as ethno-territorial entities with protections for cultural identity
Law 99 of 1993	Establishment of the Ministry of the Environment and organization of the National Environmental System ( <i>Sistema Nacional Ambiental –SINA</i> )
Law 165 of 1994	Approval of the Convention on Biological Diversity (CBD)
Decree 1371 of 1994	Conformation of the High Level Consultative Commission and Departmental Commissions (venue for dialogue and collaboration between the government and communities)
Decree 2314 of 1994	Establishment of the Study Commission to formulate the Development Plan for Black Communities
Law 199 of 1995	Regulates the work of the Ministry of the Interior in relation to Black Communities
Decree 1745 of 1995	Land titling in Black Communities
Decree 2248 of 1995	Establishment of the Consultative Commission
Decree 2249 of 1995	Conformation of the Pedagogical Commission for Black Communities
National Biodiversity Policy (1996)	Sets out the manner in which Colombia plans to direct long-term national strategies for biodiversity and defines responsibility in the different areas of action
Decree 1627 of 1996	Establishes of parameters for the registration of Base Organizations of Black Communities
Decree 2344 of 1996	Establishes of parameters for the registration of Base Organizations of Black Communities
Decree 879 of 1998	Regulates Territorial Organization Plans
Decree 1320 of 1998	Prior Consultation



Law, decree, or policy	Contents
Decree 2546 of 1999	Establishes the Directorate of Black Community Affairs within the Ministry of the Interior
Decree 1523 of 2003	Regulates procedures for the election of representative and substitute representative of the Black Communities to Boards of Regional Autonomous Corporations
Decree 3770 of 2008	Regulates Consultative Commissions; establishes requirements for the registration of Community Councils and Community Organizations
National Policy for the Comprehensive Management of Water Resources (2010)	Spatial structuring for coherent watershed and river basin planning
Resolution 121 of 2012	Calls upon Legal Representatives of Community Councils to attend Departmental Assemblies
National Policy for the Comprehensive Management of Biodiversity and its Ecosystemic Services (2012)	<p>Self-criticism of the fragmented model of environmental management</p> <p>Explicit recognition of the underlying causes of the destruction of biodiversity</p> <p>Proposal for active and collaborative intervention by all institutions, social sectors, and citizenry to recover governance of vital processes.</p>
Resolution 733 of 2013	For collaboration and assistance to the Autonomous National Congress of Community Councils. Calls for departmental assemblies of Black, Afro-Colombian, <i>Raizal</i> and <i>Palenque</i> Communities.