



**COmmunity-based Management of
EnviromenTal challenges in Latin America**



Deliverable D2.1: “Stakeholder vision on Socio- ecological System situation in Colombia case study”

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1. Introduction

1.1. Importance of the Colombian case study

Colombia with just 0.8% of the world area is classified as one of the seventeen countries with more biodiversity in the world (Salazar-Holguin et.al, 2010). Colombia has 18 ecological regions, the highest number in Latin America, and 65 types of ecosystems. Although Colombia has been recognized in many international forums as an example of an effective use, management and conservation of different natural resources, the country has many species in risk of extinction. For instance, Colombia is the leader in diversity of birds in the world with 1,885 species, but 6% of them are in risk of extinction; the country is in the second position in relation to plants with 41,000 species, but 1,5% are endangered species; Colombia is in the third position in terms of reptiles with 524 species, but 5% of them are in risk; and regarding mammalian, Colombia is in the fifth position with 471 species, but nine of them are in risk (http://www.larepublica.com.co/archivos/TENDENCIAS/2010-02-27/la-biodiversidad-de-colombia-esta-en-peligro-de-extincion_94354.php).

In 1991, the Colombian Political Constitution gave to State the responsibility of "protecting the diversity and integrity of environment" and "conserving the areas of special ecological importance" (Art. 79 inc. 2º., our own translation). Furthermore, the Colombian Political Constitution recognises that research and information are central themes in order to practice the environmental rights and duties (Cháves and Santamaría 2006, p. 78). In 1993, the Environmental National System was created and it contains all the orientations, norms, activities, resources, programmes and institutions which allow the implementation of the general environmental principles stated in the law. One of the main topics of this system is the biodiversity management and the need of researching and getting more knowledge regarding Colombian biodiversity. In this sense, in 1993 the Biological Resources Research Institute Alexander von Humboldt was created with the aim of carrying out research about genetic resources of national flora and fauna, and building the scientific inventory about Colombian biodiversity. In 1997, the Biodiversity National Policy was stated with three main themes: to know, to conserve, and to use in a sustainable way the biological diversity. Currently, this policy is in a process of updating and of presenting and discussing with civil society and institutions. As part of this process, since 2009 the Humboldt Institute has been built an agenda for institutional research on biodiversity, and in 2011 the Quadrennial Institutional Plan of Environmental Research (2011-2014) was stated as the main institutional strategic tool to orient and support the management of Colombian biodiversity within the context of productive activities. The

strategic outputs of this plan are stated in four dimensions: 1) biodiversity and its structuring character of the territory; 2) biodiversity as an essential factor for Colombian people well-being; 3) public awareness, biodiversity for all and with a place in our culture; 4) capacity generation and transversal institutional strengthening.

As part of the agreements of the Conferences of the Parties of the Convention on Biological Diversity, signed by Colombia in 1992, the Institute von Humboldt has written some reports regarding Colombian biodiversity: in 1998 the "National Report about the state of biodiversity" (Cháves and Arango 1998); in 2006, the "National Report about the advances on the knowledge and information regarding biodiversity 1998-2004" (Cháves and Santamaría 2006); in 2008 the "Report about the state of the biodiversity in Colombia" (Romero et al, 2008); and in 2010 the "Report about the state of renewable natural resources and environment, component of continental biodiversity - 2009" (Salazar-Holguín et al, 2010). Also, in 2001 the Institute of Hydrology, Meteorology and Environmental Studies stated the "environmental base line" which included a component related to biodiversity (IDEAM, 2002). Furthermore, there is an "Information System on Biodiversity in Colombia" (Bello-Silva *et al.* 2006).

In Colombia, there has arisen the importance of the water and biodiversity conservation and management practices developed by local communities, such as the afro-Colombian communities in the Pacific Coast (Escobar, 1998, Maya, et al, 2010). The law 70 of 1993 recognized black communities as an ethnic group and defined the collective property rights for black communities, which have been occupying public or state lands in diverse watersheds draining into the Pacific Basin. This law also established mechanisms for the protection of the cultural identity and rights of these communities, and for the promotion of their economic and social development, since their use and protection of natural resources are based on traditions, ancient practices, relational local forms (e.g. confidence and reciprocity) and "nested institutions". The law 70 defines a number of provisions for conservation and sustainable use of ecosystems and natural resources. As part of the implementation of this law, several Black Community Councils (*Consejos Comunitarios de las Comunidades Negras*) were created in the Pacific Basin. Two of them are the *Alto y Medio Dagua*, and *Cuenca Baja del Río Calima*¹, which are the case studies in Colombia. The Community Councils illustrate the systems of local rules and norms and their coordination with national legislation; the establishment of conservation priority zones; the harmonization that these communities try to do between the criteria of economic development and local development and the adaptation of international criteria of protected areas declaration with local needs and perspectives. Both Community Councils

¹ In the rest of this document, we will refer to these Councils as Dagua and Calima, respectively.

are mostly conformed by black communities, mainly settled all along the shores of the Dagua and Calima rivers. These Councils possess a collective heritage and mythology that marks them as a human group with a common history, based upon their origins as slaves brought from Africa to America in Colonial times. Their concept of territoriality helps them for understanding community action and philosophy, an important part of the process of territorial and environmental organization in the Pacific area.

Both Community Councils are located in the Chocó biogeographic region. This region has been recognized internationally as one of the most biologically diverse areas on the planet. This region stretches along the Northwestern edge of South America from Southern Panama to Northwestern Ecuador, and limits to the east with the western slope of the Andean Zone and to the west with the Pacific Ocean. The eco-region covers a total of 130,000 km². The Chocó Biogeographic Region boasts several types of ecosystems ranging from cloud and mountain forests to coastal mangroves. The mountain forests cover diverse types of mountains and protect the network of streams and rivers that feed freshwater to extensive mangrove forests. There are a variety of ecosystems built by the combination of different climates and elevations, which makes this territory a sanctuary for an important number of endemic and endangered species. In addition, threatened migratory species (e.g. birds) visit this territory. From the sustainability perspective, the close location of this territory to the Farallones de Cali National Park gives this territory an additional significance. The territory of these Community Councils is also part of an area of great hydrography wealth as part of the Pacific Ocean watershed. This hydrographical system is a key element not just to support the local biodiversity, but also provides water for the local communities' domestic consumption, agriculture and mining activities. The fauna in this territory is diverse and abundant. This territory is inhabited by various species of mammals, from small bats to pumas, ocelots, tiger cats, foxes, and spectacled bears. Marsupials are important, as well as five species of primates. There are also giant anteaters, two-toed sloths, the southern spiny pocket mouse, hares, otters, deer, coatis, and armadillos. It is calculated that in the territory of these Community Councils and the nearby Farallones de Cali National Park the total number of bird species is 600. Amphibians are represented by toads, frogs, salamanders, and "cecilias," or humming frogs. There are also some endemic species of Colombian fish such as the jewel cichlid, the freshwater sardine or minnow, and the rollizo snapper.

Communities in this territory have an economy based on the exploitation of natural resources such as forests, soils and minerals, fisheries and sceneries. Timber and minerals (mainly gold) are destined to national markets destination, while fisheries and agricultural products have primarily a domestic use and local markets. Sceneries are used by an

incipient local tourism industry. Historically, local communities have developed a close connection with the natural environment. This connection became the central axis of the social organization and facilitated the emergence of a local culture closely linked to the ecosystems and with a strong sense of belonging to the local territory.

Several social-environmental conflicts can be observed in this territory: conflicts for accessing natural resources (e.g. illegal timber extraction, mining and hunting), overexploitation of natural resources (particularly forest and fisheries), infrastructure development affecting ecosystems and local communities, access to and forms of use of water, presence of illicit crops and illegal armed groups.

1.2. Methodology

The methodological approach in Colombian case study develops methodological orientations presented in the COMET-LA DOW proposal, particularly in WP1, WP2, and methodology (Part B) sections. The present document emphasizes methodological adaptations to approach the process of characterization of SES. The methodological approach is framed by "Action-Participative Research APR" (Investigación Acción Participativa IAP) and an approach to analyze social-ecological and governance systems in the area of study, as well as the way in which climate change affects them. Furthermore, a gender perspective permeates the entire project. In summary, this section describes adaptations constructed to develop scientific and participatory methods identified in T.2.1, D1.1 and the general COMET-LA methodology for SES characterization.

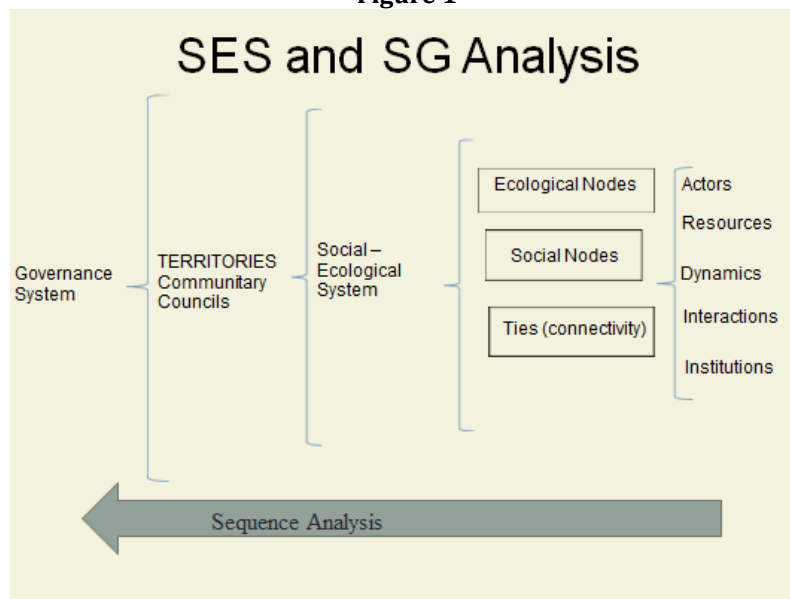
Taking into account that COMET-LA project concept proposes to create a participatory "*learning arena*" that involves different communities, stakeholders and researchers, we have explored diverse approaches and methods to build this *arena*. One of these approaches is the Action-Participative Research (APR), which implies to build the research process with communities. In order to carry out an APR it is necessary to have co-researchers within communities who will be trained by Javeriana team in participatory and other field tools to collect and analyze both quantitative and qualitative information and data during the three years of COMET-LA. Co-researches will in turn train other community members in order to create a local research team able to continue researching processes after COMET-LA ending. Part of the APR is the application of tools of Participatory Rural Appraisal (PRA) (Diagnóstico Rural Participativo DRP). In the appendix 1, some of these PRA tools are described.

Social-ecological systems (SES), their governance systems and the way in which climate change affect them are the central aims of this research process. SES is a concept increasingly used as it has been realized that "the ecosystems that many want to protect

are embedded in different levels of social organization" (Brondizio, Ostrom & Young, 2009). Hence the study of local societies and institutions are a central factor to consider when studying SES (Brondizio, Ostrom & Young, 2009; Halliday & Glaser, 2011; Berkes & Folke, 1998). As a working definition, in this study we understand a SES as a network integrated by diverse organized human and ecological nodes permanently interacting in the context of the Dagua and Calima watersheds (Anderies, Janssen & Ostrom, 2004; Janssen et al., 2006; Resilience Alliance, 2007; Brondizio, Ostrom & Young, 2009; Becker, 2011; Halliday & Glaser, 2011;). Spatially, the SES boundaries in this study are those of the local villages and the surrounding environment in which the production systems and other sources of environmental services are located. Geographically, the boundaries will be determined by the distance at which local inhabitants mobilize for using biodiversity and managing their production systems. Geophysical elements include water (and agriculture) and biodiversity.

Based on the above perspective and definition, the general methodology devised to analyze SES and the governance system (SG) of the Pacific region and how the climate change affects those follows five general components. Figure 1 reflects this process.

Figure 1



Source: Colombian team

The first component is oriented to explore and select key variables of SES. This analysis is oriented to explore five (5) variables: Actors, Resources, Dynamics, Interactions and Institutions – ARDI (Etienne et al, 2011). To facilitate the analysis of each ARDI variables diverse Participatory Rural Appraisal - PRA research tools (see a description of this below) and detailed review of literature has been conducted. To formalize characterization of

each variable, a protocol was devised and has been applied at the local level. Expected results include a characterization of selected SES and the identification of key issues affecting SES. The different stakeholders view on SES is one of the first steps of this component, and this deliverable focuses on it.

The second component is oriented to conduct a detailed reading of the social structure of the territory, and its connectivity with the natural environment. This analysis explores three (3) components: Ecological nodes, social nodes and ties. This analysis is guided by Social Network Analysis – SNA and the livelihoods approach. The analysis of each component will be conducted using PRA research tools, interviews and surveys. Expected results include a structural depiction of SES and forms of connectivity between social and ecological components.

The third component is oriented to construct a detailed characterization of SES using results from the first two components. At this stage impacts of climate change will be identified using PRA research tools and triangulation with official information obtained from the CVC² and IDEAM³ institutions. Expected results include a detailed characterization and definition of SES, and a description of diverse impacts resulting from climate change influences.

The fourth component involves an institutional analysis of Community Councils (CC). In this component a detailed reading of the political dimension of CCs will be constructed, using PRA and SNA research tools. Expected results include: first, a detailed description of CCs as an institution and its political dimension; second, a descriptive qualitative model of SES biodiversity management.

The second, third and fourth components are expected to be done by August 2013.

The final component is oriented to describe the governance system of SES in each of the CCs studied. This component is based on results obtained in each of the four previous components. Expected results include the characterization of SES governance system in each of the CC studied, and the impacts climate change are generating over them. This component will be presented as part of the deliverable D1.5 (Sustainable management and governance models).

The Prospective Analysis starting in May 2013 will fit with the process explained above.

To develop the first two components, it is necessary to identify a sample of specific SES in each of the territories. To conduct this exercise several steps have to be conducted. Next,

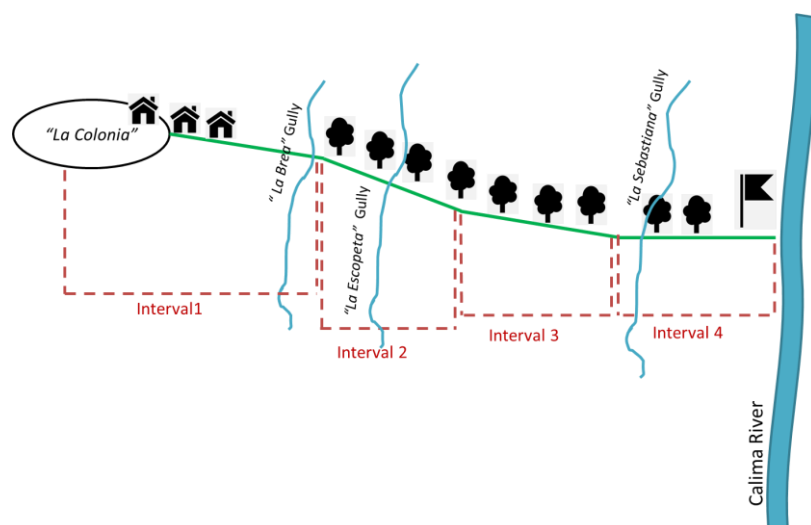
² The CVC is the "Regional Corporation of Valle del Cauca for natural resources management", regional government institution in charge of devising policies and rules to control use of non-renewable resources, to control deforestation and timber extraction, and interdict illegal wildlife trafficking, among many other tasks and responsibilities.

³ IDEAM is the National Institution of hydrology, meteorology and environmental studies

these steps are described to define the system boundaries. Identification of SES is, in this case, a special activity because of the size of each of the studied territories and their biophysical and socio-economic characteristics. In order to overcome these challenges, an approach to delimit SES, including four steps, has been devised.

In the first step two transects in each of the studied CCs territories have been conducted. Cartography analysis and transect methodology were applied. Transects were conducted in a way that cover key biophysical and socio-economic components of the territory. These exercises facilitated the identification of central aspects which are used to identify and delimitate SES boundaries. An example is shown in Figure 2.

Figure 2. Example of transects



Source: Field work conducted in June 2012

In the second step, four variables were used as a guide in order to systematize the information collected along the transect: production systems, forest, soils and water. This exercise also reflects participants' perspective on the current state of these variables (See an example in Figure 3).

Figure 3- Systematization of main variables

Variable	Interval 1	Interval 2	Interval 3	Interval 4
Productive Systems	Terraces, patios, domestic fauna (chickens)	Cacao, plane tree, yucca, sugar cane, <i>chontaduro</i> , <i>papachina</i> , mining	Not registered	Cacao, plane tree, corn, yucca, lemon, <i>borojó</i> , <i>chontaduro</i> , <i>chivo</i> , <i>guanábana</i> , <i>zapote</i> , cows, timber extraction y extraction of minerals from rivers
Forest	Poor vegetation, <i>paco</i> , <i>chaquiro</i> , <i>zapote</i> , <i>árbol de pan</i> , <i>caimito</i> , oil palm, <i>chontaduro</i> , <i>garzo</i> , <i>sangre gallina</i> , <i>nacedero</i> , <i>balso</i>	Highly intervened, <i>castaño</i> , <i>garzo</i> , <i>costillo</i> , <i>sangre gallo</i> , <i>chaquiro</i> , <i>balso</i> , <i>caposo</i> , <i>mora</i> , timber extraction, burnings	Secondary forests, enrichment activities, reserve forest, <i>chanul</i> , <i>chucha</i> , <i>popa</i> , diversity of palms.	Highly intervened,, abandoned crops of african palm, <i>guadua</i> , <i>chanucillo</i> , <i>guabos</i> , <i>coronillo</i> , <i>paco</i> , <i>jagua</i> .
Soil	Rich on nutrients when close to houses, otherwise is acid.	Acid soil	Acid and cracked soil	Good availability of nutrients, balanced soils, sustainable agricultural use
Water	Systems for collecting water from the rain	Abundant water , water sources, people use rivers and gullies for washing their clothes	Abundant water	Abundant water

Source: Field work conducted in June 2012

The third step approaches central features of local livelihoods. Figure 4 summarizes key actors connected with local SES, their activities and capitals in use. These aspects represent structural components of local livelihoods, and capitals currently in use.

Figure 4. Actors, activities and capitals of local livelihoods

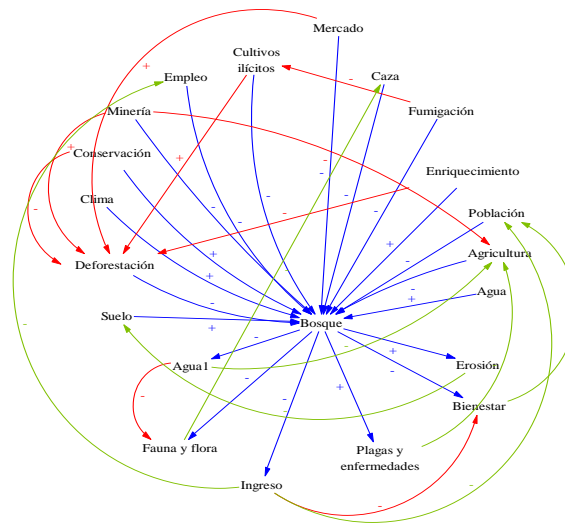
Actors	Activities	Capitals
Miners	Handcrafted extraction of gold and other minerals from rivers	Natural, financial, social
Farmers	Production of food, fishing, mining, hunting and other alternative/informal activities	Natural, financial, social (<i>mingas</i>)
Town dwellers	Timber extraction, cabinet making, traders	Natural, financial, social
Timber traders	Extraction, processing, selling and buying timber	Natural, financial
Institutions/ Organizations	Community Council, European Union, <i>Sena</i> (Educational Institution), CVC (Environmental authority), Ecopetrol (Oil extraction), Municipality of <i>Bajo Calima</i>	Social, physical, financial, human

Source: Field work conducted in June 2012

Two aspects are worth mentioning in this case. One is that local livelihoods composition is subject of permanent variation in dependence of time of the year and activities in the territory. Second is that timber extraction is the central activity and the main source of income along the year.

Considering the rapid process of deforestation, and resulting impacts over water and biodiversity, in the final step the variable "forest" was selected and a mental model approach was applied (see figure 5) to identify in detail local perspectives on issues affecting the forest. In this territory, the forest is the central component of livelihoods and SES. The mental model approach facilitated the collection of the local perspective about the forest and the identification of causes and effects leading to its actual state.

Figure 5. Mental model of local perspectives on issues affecting the forest⁴



Source: Analysis made using information coming from the field work conducted in June 2012

The figure 5 reflects the local view about the state of the forest and how biodiversity, water and livelihoods are threatened by a complex combination of causes connected with illegal crops and illegal extraction of natural resources. In this picture, the role of climate change is also identified as one of the causes accelerating forest rapid transformation.

The inclusion of a gender perspective in the analysis of SES, its governance and the effects of climate change on this, means to study "the different roles of women and men in order to understand what they do, what resources they have, and what their needs and priorities are" (FAO, 2011). "This data is often not directly available, making gender analysis essential. This is why gender-responsive and socially-sensitive climate change research work is important – it will help pinpoint data needs and data collection approaches in the context of climate change" (CCAFS and FAO, 2012: 7). Gender analysis implies to take into

⁴ The variables in the figure are translated to English as follows: Bosque: Forest; Suelo: Soil; Clima: Weather; Conservación: Conservation; Minería: Mining; Empleo: Employment; Cultivos Ilícitos: Illegal crops; Mercado: Market; Caza: Hunting; Fumigación: Aspersion; Enriquecimiento: Enrichment; Población: Population; Agricultura: Agriculture; Agua: Water; Erosión: Erosion; Bienestar: Wellbeing; Plagas y enfermedades: Plagues and diseases; Ingreso: Income; Fauna y Flora: Fauna and Flora.

account analysis categories such as: interactions fields (e.g. productive, reproductive, community, political, cultural), access and control on resources and benefits, and practical and strategic interests. Although a gender perspective has been included already in the first seven months of the project in Colombia, this approach is going to be applied more explicitly in the following steps of the project.

1.3. Sources of information for this deliverable

This document presents the deliverable D2.1 which contains the main elements of the stakeholder's vision on the socio-ecological systems of the Community Councils of **Dagua** and **Calima** (Buenaventura, Valle del Cauca, Colombia). The information here presented is a result of the preliminary systematization of the Natural Resources Management Plans made by the Community Councils (Consejo Comunitario Bajo Calima, Corporación Autónoma Regional del Valle del Cauca – CVC - and Fundación Ecobios, 2008; Consejo Comunitario de la Comunidad Negra de la parte Alta y Media de la Cuenca del Río Dagua, CVC and Fundapav, 2007) and the primary information gathered from the field work, in which participatory workshops, transects and a forum carried out between June and August 2012 served as the main methodology for identifying and constructing the visions of stakeholders (community members, community leaders, local non-governmental organizations, governmental organizations, and academia). The activities carried out in the field work were:

- Transects: June 2012. One transect in each community council. In each of these exercises an average of 20 people participated, men and women, in ages between 18 and 50 years, all of them members of the group of co-researchers, Community Councils leaders, members of two local NGOs (Fundapav, Fundación Ecobios), and the teamwork of Javeriana University.
- Workshop with members of both Community Councils: 22nd of August 2012 in the meeting center of community council of Dagua ("La Delfina"). In this workshop 12 male members of Calima, 17 (9 men and 8 women) of Dagua and three members of Fundapav participated. It was conducted by the team of Javeriana University, and members of other institutions of COMET-LA also participated (see appendix 2 with Attendee List). Three Participatory Rural Appraisal (PRA) tools were used in this workshop: Historic Graphic (population, biodiversity, water resource, productive activities, community organizations and institutions), Matrix of conflicts, and Matrix of rules and norms (see appendix 1 for description of these tools).
- Stakeholders forum: 23rd of August 2012 in Buenaventura. 60 stakeholders (25 women and 35 men) participated in this forum, coming from community councils;

Buenaventura Mayor Office; national, regional and local environmental institutions; local, regional and national academic and education institutions; and local NGOs. The forum was conducted by the team of Javeriana University, and members of other institutions of COMET-LA also participated. One Participatory Rural Appraisal (PRA) tool was used in this forum: SWOT matrix (see appendix 1 for description of this tool).



Photo 1. Members of Community Council of Dagua carrying out a transect. Field Visit, June 2012.



Photo 2. Workshop in La Delfina with members of Community Councils of Dagua and Calima. 22nd of August, 2012.



Photo 3. Stakeholders Forum. Buenaventura. 23rd of August, 2012.

It is important to say that both Community Councils in collaboration with some academic institutions and NGOs, have been carried out diagnoses on their territories which have rich data and information, but the documents have not been published and the Community Councils do not allow to use this information yet. As soon these diagnoses are available, the information will be used in the forthcoming deliverables and to improve the characterization of the SESs and the governance systems of the Community Councils territories.

Next, this document presents an area description of the Colombian case study. This description is based mainly on information from Natural Resources Management Plans made by the Community Councils (Consejo Comunitario Bajo Calima, Corporación Autónoma Regional del Valle del Cauca CVC and Fundación Ecobios, 2008; Consejo Comunitario de la Comunidad Negra de la parte Alta y Media de la Cuenca del Río Dagua, CVC and Fundapav, 2007). In some parts (e.g. governance, system, recent historical background, conflicts among users), the information comes from transects and the workshops with members of both Community Councils carried out on June and August 2012. The third part of the document is the SWOT analysis for the case study from the points of view of different stakeholders, which information was gathered from the stakeholders forum in August 2012. Finally, some conclusions are offered in terms of the stakeholders view on socio-ecological systems and their governance, as well as regarding some methodological issues.

2. Study area description

2.1. Resource System

2.1.1. Ecological components

The ecological components of both community councils are characterized by an outstanding amount and variety of natural resources, such as diverse species of flora and fauna, different kind of soils, abundance in terms of water fountains, high potential of metallic and no metallic minerals, energetic and industrial resources, besides a great timber potential, ecological tourism and coastal resources for the use of fishery. Their strategic location, right next to the Pacific Ocean does also assure port activities of great importance. The rivers, also named Dagua and Calima, are a very importance source of water and a mean of transportation for the Council's dwellers.

2.1.2. Location and system boundaries

Both community councils are located in the municipality of Buenaventura, in the Colombian Department of Valle del Cauca, on the south-west pacific coast area. **Calima** has 66.764 has, while **Dagua** has 8.764 has. They belong to the Chocó bio-geographical region whose land extension is 7.259.000 has., comprising the 5.3% of the overall Colombian territory. This region has also one of the vastest biodiversity in the world, as has been mentioned, and provides the 79% of timber used in the country.

As mentioned above, the size of both territories demands a specific approach to identify and delimit SES boundaries.

2.1.3. Quantification of resources and size of resource system

2.1.3.1. Natural resources available

As already stated, both councils have access to numerous natural resources: Abundant watersheds, vast forests, proper soil and climate conditions for the conduction of various productive activities, and great biodiversity in terms of fauna and flora.

As mentioned above, both community councils have been carried out diagnoses of their territories which include detailed information on quantification of resources. Forthcoming publication of these resources will make them available for this project.

2.1.3.2. Access to inputs and investments

According to the legal constitution of community councils (under the Law 70 of 1993), they have total ownership over their land, which also entitles them with access to capital and labour coming from the use and extraction of their natural resources. The farms are

family plots of limited extension (around 0.5-1 ha.). The legal ownership over the plots was entitled in the form of "Collective title", according to the Legislation regulating Community Councils in Colombia. The majority of the plots are being inherited from generation to generation, although one can also access the land by loan, rent or purchase, with the previous authorization of the Council's authorities. New families coming to the territory most follow the rules of the specific community in which they plan to settle.

According to stakeholders, there have been problems regarding the effects of the armed conflict in the region, since some of the families have been forced to leave their land – threatened by illegal armed groups- and find a place to leave in Buenaventura. Some of them have returned over the years, but some plots are left abandoned, and seen as opportunities for foreigners that take over them without respecting the principles of collective titles. This problem is particularly important in the **Calima** territory where keeping track of changes in land use and land ownership is particularly hard because of its vast extension, and Council's authorities cannot have access to the whole territory. This also has implications in terms of the observance of internal norms, as it will be described later.

Sources of employment in the area of study are traditional economic activities, such as agriculture, mining, timber extraction, and fishing, but an explorative diagnosis conducted within the COMET-LA Project has shown that people tend to get monetary resources from different activities, such as construction, commerce, domestic duties, among others. Therefore, a person devoted to agriculture can also use his/her time working in other formal or non-formal economic activities. There are few evidences to state that monetary inputs are being invested or re-invested, as economic activities tend to be focused on subsistence. Further explorations might shade more light over this matter.

2.1.3.3. *Economic activities*

The most important economic activities that are conducted within both Councils are timber extraction, artisanal fisheries and mining. They are part of local livelihoods and have different weights depending on the topographic areas and the specificities of each community:

Timber extraction: For the case of **Dagua** this activity does not have a significant importance: stakeholders calculate that only 11 of 507 families are devoted to it. For the case of **Calima**, timber extraction has happened in great dimensions, especially during an extraction grant of 15.000 hectares given to *Cartón de Colombia* (paper production company) by the Ministry of Agriculture in 1959, this was followed by another grant of 25.000 hectares to Pulpapel, until 2005. Community members also use timber extraction

as their livelihood, they sell it to pay for food and education for their children, but the current price is not competitive and does not cover their daily monetary needs, also because there is neither knowledge nor tools for adding value to timber through manufacturing.



Photos 4 and 5. Timber extraction in Calima, Field Visit, June 2012.

Artisanal fishery: For both the cases of **Dagua** and **Calima**, fishery is not one of the most important activities, it is used only for own consumption, so fishes are not used for commercial matters. Community members also interchange fish with other commodities, such as fruits or vegetables. However, stakeholders especially for the case of **Calima**, state that fishery is progressively losing importance, since forest felling is considered as more attractive and profitable.

Artisanal Mining: Both in **Dagua** and **Calima**, **gold** mining is part of local livelihoods. Artisanal techniques and related knowledge has been kept across generations, although the amount of gold that can be found has consistently decreased. Especially for **Dagua**, this traditional extraction practices have been threatened by the presence of external actors using industrial tools for extracting gold from the rivers, which has also been a threat to the sustainability of watersheds. Detailed description is presented below.

Agriculture: For the case of **Calima**, agriculture has an important place but not as significant as timber extraction. Community members use what they grow mainly for self-consumption, as only a few products are being commercialized in neighbouring communities. On the other hand, agriculture is the main economic activity in **Dagua**, where approximately 167 families are devoted to this activity, growing over 25 species of fruits and vegetables as part of diverse production systems compositions. There is an active use of medicinal plants both cultivated and obtained from the forest.



Photos 6 and 7. Agricultural Plots in Dagua, Field Visit, June 2012

Livestock and fish: Both for **Calima** and **Dagua**, some community members have hens, chickens or pigs and use them for self-consumption. Low scale aquaculture and use of river fisheries were also registered.

Tourism: For the case of **Calima**, there were tourism activities registered in some communities. However, this source of income has substantially decreased due to the insecurity derived from the armed conflict. **Dagua** has 23 families working on tourism, especially around the main road, which is parallel to the Dagua River. Community members also make use of these areas for commercializing traditional products.

2.1.3.4. Transport infrastructure: local and connection with region main centres

Both councils are closely connected to the city of Buenaventura, which has one of the most important ports of Colombia. They are also a few hours away from Cali, the capital of the Department of Valle del Cauca. The Councils, especially **Dagua**, are currently facing the expansion of the main road, connecting Buenaventura and Cali. This road has a strategic importance for the economic development of the country, since it is the only connection to the port from other regions. As this road is in expansion, journey between Buenaventura and Cali currently takes 4-5 hours for 122 kms. of distance, which makes very difficult the communication between these two cities. Although this infrastructure work might cause substantial environmental impacts, the Council has managed to discuss and establish a set of conditions that the Invías (Road infrastructure Government agency) has to undertake in order to fully repair what gets affected by the construction and further use of the expanded road.

Dagua small communities are also connected through a railroad, used by community dwellers as mean of transportation adapted to their necessities (photo 8). In both councils, the rivers are also used as communication and transportation means as well as there are roads connecting communities, in which one of the transport means is local buses ("*buses escalera*" or "*chivas*") (photo 9). **Calima** communities are connected through the river and

a secondary road coming from the main road. However, the majority of the Calima's territory is not connected via roads, leaving the Calima River as the only option for transportation among communities. It is important to note that some regions are not accessible, due to the density of the forest or to the presence of illegal armed groups, whose control over the land threatens several factors in the development of communities. Furthermore, Buenaventura is connected to Bogotá through flight three times a week.



Photo 8: Adapted rail transport between small communities in San Cipriano



Photo 9: Local bus ("bus escalera" or "chiva") used by inhabitants

2.1.4. Productivity of the system

As mentioned before, local livelihoods are diverse and their composition change throughout the year. Family members rotate their activities such as agriculture, road construction, timber extraction, mining, tourism, and other sources of employment.

In Dagua, agriculture is one of the main sources of employment and income. Agricultural production is based on various fruits and vegetables such as banana and plantain (*Musa acuminata x Musa balbisiana*), avocado (*P. Americana*), lemon (*C. limon*), orange (*Citrus x sinensis*), yuca (*M. esculenta*), maize (*Z. maiz*), chontaduro (*B. gasipaes*), coconut (*C. nucifera*), tomato (*S. lycopersicum*), guava (*Psidium*), sugar cane (*Saccharum officinarum*) and medicinal plants usually not processed and commercialized locally and in Buenaventura. For the case of timber and gold, those are also important commodities, but do not often get the proper conditions for getting commercialized and therefore becoming profitable and sustainable sources of employment.

In both Councils some people find employment opportunities in other sectors apart from resource extraction, such as health, education and domestic duties in Cali and other nearby cities. However, the unemployment rate reaches the 70% of the population (2007). This is particularly problematic for women, who cannot find other sources of employment, especially when natural resources are facing constant exhaustion. It is important to mention that there is a high percentage of informal employment in the territory.

The majority of community members get their incomes from the economic activities already named. There is no evidence of them getting alternative sources of income from the government or from family members located abroad (remittances). Stakeholders identify the lack of economic opportunities that could be significantly profitable for community members; there are not any credit opportunities either.

In terms of access to incomes, there could be different types of community members. The most educated ones and community leaders could have access to more income pursuing opportunities, such as projects coming from external allies or the government, or from belonging to non-governmental organizations. Youngsters with access to education might find other opportunities for excelling their incomes, but most of them mean leaving their land and moving to Buenaventura. On the other hand, people specifically devoted to resource extraction, with less education, might only have the opportunity to use what they extract as livelihood.

Although most of what is produced is used for own consumption or non-monetary trade with other community members, some of the products, such as zapote (*D. digyna*), chirimoya (*annona cherimola*), chontaduro (*B. gasipaes*), banano, plátano, and primitivo (*Musa acuminata x Musa balbisiana*) are being commercialized at neighboring communities, Buenaventura and Cali. Community members do not have a formal contract with traders and sellers, meaning that commerce options are often unstable.

Manufacturing is at its very early stages in both Community Councils while agricultural and artisanal produce prices are very low in local spot markets.

2.2. Governance System

For both Councils, there is a set of organizations whose function is to coordinate and drive governance among communities. Although the main and highest authority lies in the Councils themselves, these other organs also play a defining role:

- **General Assembly:** Constituted by all registered community members, whose socialization and approval are vital to decision making processes of the Board of Directors.
- **Board of Directors:** It is made up by delegates elected in each community. In the case of Dagua, each *vereda*⁵ in General Assembly elect, through voting, two representatives to Board of Directors. In the case of Calima, General Assembly elects members of Board of Directors. By law, the Board of Directors of Councils are elected for three years, and the re-election is possible just once. According to

⁵ In Colombia, municipalities are internally divided in *veredas*.

the legal statutes of the Councils, this organ orientates the collective construction of policies, programs, projects and actions, and guarantees their implementation, evaluation, monitoring and systematization. Their functions are driven by the defence of culture, unity and autonomy.

- **Legal representative:** This is the member of the community elected by the General Assembly who legally represents the Community Council.
- **Veredales committees or coordinators:** They were created in 2005 with the purpose of expanding the base of community participation. Each community elects their representatives, who also become members of the Board of Directors, which allows a full representation in decision making, socialization and validation processes, regarding the specific issues of each community and the collective territory as a whole.
- **Boards of Community Action:** They existed before the creation of the Community Councils, as the main interlocutors between communities and the government to discuss the main guidelines for community development.

In both Community Councils there is a set of internal and external rules and norms regulating the use of natural resources, specifically biodiversity and water. In the workshop carried out with members of both Community Councils in August 2012, these norms and rules were discussed. The Community Council of Dagua has **internal rules** which forbid conducting industrial mining, contaminating water, felling the forest, hunting animals for commercial purposes, using herbicides, using dynamite or other chemical substance for fishery, and burning out the soil or garbage. According to the perception of community members, the majority of these rules are being observed to a great extent. They acknowledge that almost the 80-90% of the people know and follow the rules. However, some of them, such as the one forbidding industrial mining, are being consistently violated by external actors, whose patterns of resource extraction are being quite detrimental to the conservation of ecosystems. Other rules, such as those related to burning out and contaminating water sources are often violated by community members. Rule enforcement mechanisms are being implemented for guaranteeing the observations of internal norms. As an overarching process, community leaders tend to identify those who violate the rules and talk to them about the importance of their rule observance. In case of systematic violation, the case is presented to the Environmental government Authorities.

In the Community Council of Calima, there are **internal norms** in the "*Reglamento interno*" (Internal regulation) which are oriented to the conservation of the reserve area.

For instance, the hunting is prohibited as well as the timber extraction and the contamination of water sources. Different from the Community Council of Dagua, members of Community Council of Calima perceive that the norms are partially met by the inhabitants, and the prohibition of contaminating the river is not fulfilled. Members of the Council talk to offenders and try to solve the situation. In case of timber extraction, the "Comité Veredal" (Village Committee), Peace Judge and Justice Team confiscate the extracted timber.

On the other hand, **external rules** in both Community Councils, specifically enforced by the Environmental Authorities (mainly CVC), are oriented towards regulating similar contaminating or extraction practices regulated by internal norms, such as timber extraction, river material extraction (except artisanal way), hunting, having forest animals as pets and deforestation. In the case the State institution finds people carrying out these activities, authorities confiscate the timber, material or animals. Illegal mining is forbid in a national level, and Buenaventura Mayor prohibits illegal mining and closes illegal enterprises in case the norm is violated. The Colombian Government prohibits the illicit crops and the way how State has faced this is carrying out forced eradication and interdiction.

In the case of the Community Council of Dagua River upper and medium basin, another important rule, considered as very pertinent for community members, is the one mandating a process of validation and agreement that has to take place when an external actor is seeking for resource extraction in the council's territory. They state that, even though the Council is the only one entitled with final approval, it is particularly difficult to monitor the observance of agreements in order to guarantee that the extractive activity of external actors keeps the principles of conservation and environmental sustainability. Incentives are also offered to the ones who are committed to the observance of rules. Rule-based behaviors are awarded with recognition, social acknowledgement and a positive reputation. These people are taken into account when the Council receives any kind of benefits or collaboration from external allies, and are considered as potential leaders, with the opportunity to teach and inspire others.



Photo 10. Post on Conserved Forest in Calima, prohibiting forest felling, mining and contamination, Field Visit, June 2012

According to the Colombian legislation regarding the territories inhabited by indigenous or black communities, when a project (resource extraction at a great scale, building infrastructure, among others), coming from the government or a private company, is likely to affect in any way their territories, is mandatory that communities get engaged in the process and get consulted prior the implementation of the project, through what is legally called a "Previous consultation". Legally, the Previous Consultation appears in Indigenous and Tribal Peoples Convention (No. 169 of International Labour Organization). In Colombia it was ratified by Law 21 of 1991, which aims to ensure the rights of indigenous and tribal peoples to their territories and protecting their cultural, social and economic heritage. In particular, the 6th article of the convention stipulates that governments must consult local stakeholders to promote their participation freely. In a national level, articles 2, 7, 40 and 330 of the Colombian Constitution of 1991, establishes the rights of indigenous and afro-colombian peoples to their territory and the maintenance of their own customs. Likewise, the article 76 of the law 99 notes "the exploitation of natural resources must be done without detriment to the cultural and social rights of traditional communities". Also, according to Law 70 of 1993 and article 330 of National Political Constitution, any decision taken about natural resources use will be taken after a consultation with the possible affected communities.

The "previous consultation" is recognized as a fundamental right for indigenous, afro-colombian and raizales in Colombia. This mechanism seeks to promote the recognition of ethnic minorities through constitutional rights. The main objective of this legal mechanism is the preservation of their cultural and environmental heritage. Therefore, compliance with this law allows the defense of ethnic, territorial, cultural rights and also helps the increasing of participation and autonomy of these communities in a local level.

It is recognized that the consultation process can be expensive and take long time given the diversity of institutional structures within indigenous and afro-colombian communities, but their implementation should generate a significant contributions to community's self-determination.

This process includes assessing the social, economic, environmental and cultural impacts that the project may have, as well as the measures that should be taken in terms of prevention, mitigation, compensation and repair over those impacts. This assessment is the base from which communities have to decide whether or not the project can actually be implemented on their territories. As it was stated before, the Community Council of Dagua is facing the process of the expansion of the main road coming from Cali to Buenaventura, and has been engaged in a "Previous Consultation" process with the governmental agency that is responsible for the building of road infrastructure in the country. Consultation led to a series of commitments and agreements (apart from important exercises of diagnosis, assessment and validation). Members of the Council have actively and and have got different elements as a form of compensation, such as a health center, a park for children, and a meeting room, among others.

2.3. Users

2.3.1. Social components of the study area

2.3.1.1. Size of the population, population centers, political units

For the case of **Calima**, the population is 3.419 inhabitants, distributed among 1.013 families in 10 *veredas* or communities (Table 1). Families are characterized for being very extensive, having an average number of six children per family. 52% of the population are men and 48% are women.

Table 1. Population of Calima Community Councils

Veredas	No. Families	No. Persons
Guadual	nd	nd
Ceibito	17	57
Trojita	22	76
La Esperanza	23	98
San Isidro	93	378
El Crucero	82	304
La Estrella	21	96
Las Brisas	27	114
Villa Estela	137	458
La Colonia	591	1838
TOTAL	1013	3419

Nd: no data.

Note: We do not present in this document the number of inhabitants per ages because the data available are not consistent.

Source: Data given directly by Calima Community Councils leaders in the Stakeholders Forum on August 23rd, 2012.

For the case of **Dagua**, the population is 2.080 inhabitants, distributed among 507 families in 6 *veredas* (Table 2). 51% of them are women and 49% are men. In table 3 the distribution in terms of ages range is shown.

Table 2. Population of Dagua Community Council

	No. Families	No. Persons
Zaragoza	106	456
Delfina	99	395
Triana	92	373
Bendiciones	85	351
Km 40	73	323
El Salto	52	182
Total	507	2080

Source: Consejo Comunitario de la Comunidad Negra de la parte Alta y Media de la Cuenca del Río Dagua, Corporación Autónoma Regional del Valle del Cauca - CVC and Fundapav, 2007

Table 3. Population of Dagua Community Council per ages and sex

Ages range	Men	Women	Total
0 – 4 years old	123	124	247
5 – 10 years old	163	140	303
11 – 17 years old	188	174	362
18 – 39 years old	332	376	708
40 – 60 years old	161	181	342
60 - +	61	57	118
Total	1028	1052	2080

Source: Consejo Comunitario de la Comunidad Negra de la parte Alta y Media de la Cuenca del Río Dagua, Corporación Autónoma Regional del Valle del Cauca - CVC and Fundapav, 2007



Photos 11, 12, 13 and 14. Inhabitants from Community Councils of Dagua and Calima. June and August, 2012

2.3.1.2. Socioeconomic and cultural attributes of users

Most users have access to education and healthcare, although these services are limited and do not have the proper infrastructure for serving the whole population, especially for those located far away from community centres (where schools and health centres are located). In terms of basic services, such as water, electricity and sanitary services, these are only available to a certain portion of the population; the majority of them lack basic public services, together with a proper housing.

In terms of socioeconomic categories for the country, the majority of the Council's population belongs to the lowest social strata 0 and 1 (the range goes from 0 to 6), which is considered as a low social class. This is measured according to the access to basic services and the daily income per capita.

Culture is highly important for black communities, especially because their identity is very much attached to their ancestral history and values, and it is a central element of community union and representation. External stakeholders perceive black communities as very kind, cheerful and open, which is not only part of their culture but a great asset in terms of social bonding, cooperation and trust. Therefore, cultural values are also linked to productive activities and orient the patterns of resource extraction and environmental conservation.

For the specific case of **Calima**, the cultural component is very important and highly valued by communities. They currently have 3 groups of dance, 2 groups of theatre, 2 music groups of young people playing traditional instruments and 20 football teams. Families play different games for entertainment and celebrate traditional holidays. Gathering together to celebrate is very important for the inhabitants of Calima since this recreates community values that are the core of social capital.

2.3.1.3. Recent historical background of the study area and history of use

In the workshop carried out in August 2012, members of each Community Council made an historical graphic, highlighting the most relevant events of their territory during the last 60 years in terms of population, biodiversity, water resource, productive activities, community organizations and institutions.

Community Council of Calima: In the 1940s the first settlers ("*colonos*") were black people arriving through the river, mainly (90%) from the department of Chocó (located in the north part of the Colombian Pacific coast), to mine gold. At that time, there was no road and people located beside rivers. Later, the timber extraction for the railroad started. In the 1950s "Cartón de Colombia" (a paper factory) was established in the region and this attracted workers from other parts of the country (Cauca, Chocó, Bajo San Juan, Valle del Cauca, Risaralda and Quindío). Consequently, different types of people (white, mestizos, black, indigenous) arrived. In the 1960s, there were three companies which produced oil palm. With the arrival of the factories and road construction the population increased in the 1980s and 1990s. But, some people, especially women, migrated to other regions and cities in order to find better job opportunities. People worked in the factory and companies, but at the same time they grow in their plots crops for daily food ("*pancoger*") such as corn, plantain, yucca, sugar cane, "*chontaduro*", fruits, and so on. Each family had

these crops in "vega" zones which are floodplains with fertile soils. There was also artisanal mining (gold and platinum) and they fished, hunted, gathered forest fruits and extracted timber in a selective way.

At the end of the 1980s, some changes motivated a transformation of social and economic factors. Both oil palm plantations and other food crops declined when the road got constructed, which was also accompanied with the expansion of non-selective timber extraction. This led to people moving away from rivers and close to the road. Food products began being brought from other regions, such as *Uraba* (on the North West). Based on these changes, inhabitants started to concentrate in villages in the 1990's.

In 1993 (February 13th), "*Cartón de Colombia*" closed down activities in the region because the permission given by the state to this factory in order to extract timber in the zone finished and the State did not renew it due to the strong community pressures. Black communities started to see the factory as a bad issue for the environment. When the factory abandoned the area some of their workers migrated.

In the 1990s, the Community Council of Bajo Calima was stated and 66.724 has. were entitled to it. Currently, this community is demanding an addition of 11.153 has.

Between 1998-2000, paramilitarism arrived to the region and the coca crops were introduced. This meant that other agriculture crops decreased. Because of the violent conflict, in 2002-2003 many inhabitants of Calima were displaced. In 2003, 220 families and 1300 people were displaced, especially to Cali and Buenaventura city. However, in 2004 (September 11th) displaced people voluntarily returned to their land, what was perceived by the community as a great success.

In order to eradicate the illicit crops, government has carried out aerial fumigations with glyphosate, which, according to inhabitants, affect not just the coca crops but also the crops for food and even the people. In 2008, Community Councils proposed and carried out manual eradication of illicit crops in their territories and they started to recover their crops for food. In 2010 illicit crops increased, resulting in new aerial spraying in 2011-2012. People continue growing crops for food in the "vega" zones (floodplains), but these crops have decreased. Community Councils inhabitants who participated in the workshop in August 2012 do not perceive a clear relationship between climate variability and decreasing of crops for food. Instead, they say that currently it is difficult to identify the best sowing time. For them, the variables affecting this are more related to illicit crops and other productive activities such as mining.

In terms of biodiversity, between the 1940s and 1960s, the territory had many species in virgin forest and there was little State and enterprises intervention. "*Cartón de Colombia*" enterprise, which arrived to the region in the 50s, as mentioned above, conducted a

selective timber extraction finishing with some of the high value forest species. Inhabitants say that more recently, illicit crops and illegal mining have been causing negative impacts on some species. In the 1980s, institutional intervention increased and different organizations carried out studies on biodiversity. In the 1990s, with the creation of Community Councils, they started to elaborate Territory Management Plans including diagnoses on biodiversity which involve both scientific and local knowledge. In the 2000s, based on information of the diagnoses, a nursery with native species for reforestation was established in Calima area. However, there have not been comparative studies between these diagnoses and prior studies in order to demonstrate quantitative and qualitative changes on biodiversity in the territory.

Community members recognize that their territory has a high level of biodiversity. According to them, fauna and flora have been used ancestrally in a rational and sustainable way by local communities.

The territory of Calima has abundant water sources. According to the inhabitants, from the 1960s when the Darién Hydroelectric was built, the water resources were affected because of the deforestation resulting from hydroelectric construction and because of the changes caused by this type of infrastructure. Also, from 1990s the water resources have been contaminated due to illicit crops and illegal mining, which have caused sedimentation in some parts of the river, the turbidity has increased and the riverbed has changed. For inhabitants, the climate variability is evident by the fact that currently there are more raining months than dry months. This affects the dynamic of the crops and the productive activities in the river floodplains ("vegas").

Regarding social organization, in the 1960s, communities or *veredas* or villages were organized in "*Juntas de Acción comunal*" (Communitarian Action Committees). In the 1970s, in Colombia, the "*Asociación Nacional de Usuarios Campesinos ANUC – Línea Sincelejo*" (National Association of Peasants– Sincelejo Line) was created and had a presence in this territory. This organization had as an aim to push and strengthen Agrarian Reform processes. According to members of the Community Council participating in the workshop, the Association did not play an important role for vindicating of rights of peasants and black people in the region. On the contrary, they say that ANUC gave permissions for deforestation which affected the biodiversity in this region.

By the end of 1980s, a training and formation process started to re-vindicate rights of black communities. The "*Organización Negro-Campesina Proterritorio Calima ONCAPROTECA*" (Black-Peasant Pro-Calima Territory Organization) was stated and currently still works. This organization has been fundamental for the creation and

consolidation of the Community Council of Calima River lower basin in the 90s, which has today autonomy in its territory.

Members of the Community Council consider that another community organization which has played a relevant role in their territory from the 80s is "Madres comunitarias" (Community Mothers). This is a State programme coordinated by "Instituto Colombiano de Bienestar Familiar - ICBF" (Colombian Institution for Family Welfare) in order to attend the vulnerable children (younger than 6 years old). Community mothers are economically disadvantaged women who are able to have a Community home ("Hogar comunitario") to provide high-quality and permanent care to some children of their community, whose parents must work or are unemployed or are displaced. Community Mothers receive training and support from the State to do their jobs and have an average monthly salary of \$US100.

Also the members of the Community Council state that there has been governmental institutional presence in their territory especially from the 1960s. At that time, the Agriculture Secretary was there together with INCORA (Agrarian Reform National Institute). In the 1970s, INDERENA (Natural Resources National Institute) was created. Tolima University opened an office in the region from the 1970s. In the 1980s the Social Pastoral of Catholic Church started to work in the region as well as Plan Padrino ("Godfather Plan" which is a scholarship programme for school children) and evangelist churches. In 1993, the presence of CVC (Regional Corporation of Valle del Cauca for natural resources management) and Environmental NGOs (Ecobios, Fundapav, Calima verde) increased. Currently, there are many state and private institutions, some of them with close relationship to the Community Council.

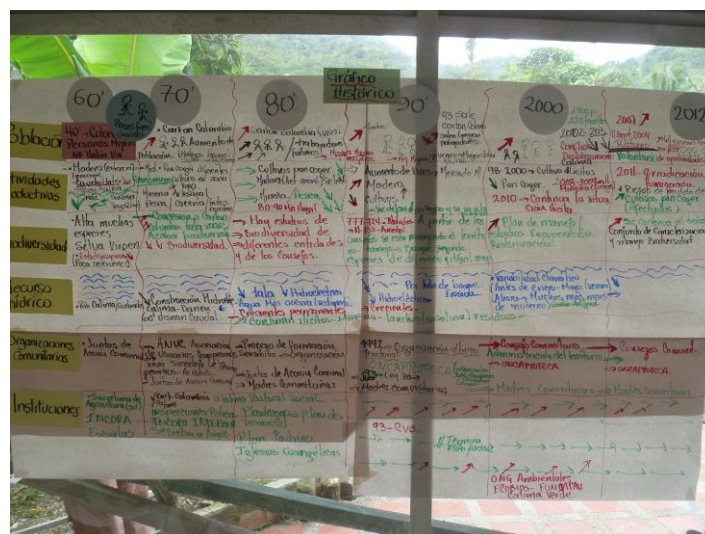


Photo 15. Historical graphic of Community Councils of Calima made by members of the Council in the Workshop in La Delfina on 22nd of August, 2012

Community Council of Dagua: The main characteristics of the population over the timeline (from 1960s to nowadays) is the population increasing. At the beginning the ratio between men and women was 1-1. During the 1960s and 1970s decades, the production relations were given mainly by the "minga" (all inhabitants of the community working together without remuneration) and "mano-cambiada" (labor exchange) systems. From the 90's the interpersonal relations changed from community work based in trust and reciprocity to the monetization of social relationships. An important moment for the community is the forced displacement suffered in 2000 due to violent conflict.

In relation to biodiversity, participants recognized a decline of environmental supply, which could be explained by over-exploitation. Also, increasing of activities such as mining, road construction and local sawmills have forced animals, which were in abundance before, have had to move to more distant territories. Forestry activities in Dagua have not developed as much as in the 1980s. Regarding water resources, although its abundance is still recognized, from the early 70's the quality and quantity of water has decreased. A possible explanation of this decreasing is the increasing of gold mining activities and the landscape transformation.

Since the early 80's, local communities and State institutions such as CVC established some regulations to reduce the harmful impact of mining and infrastructure building on water resources.

Among several productive activities, three are recognized as constants in the territory, these are artisanal mining; timber, wood and other forest product extraction, and agricultural production. Mining has gained ground, from traditional to mechanized extraction, while farming and timber extraction has declined in hectares and people dedicated to the activities.

According to local inhabitants' perception, the keystone regarding community organization, which went from community action boards to community councils, was the enactment of law 70 of 1993.

Regarding external institutions, participants identified the presence of the Mayor Office during the decade of the 1970s working together in the construction of the communities. At the productive level, Ecopetrol (Colombian Petroleum Company) and timber companies were key actors in the regional economic development. In the early 80's, INDERENA (National natural resources management and protection institute) started to have presence in the region and later the CVC (the local environmental government agency) increased its participation in the natural resource management. Currently, the presence in the territory of the CVC is valued positively by the community.



Photo 16. Historical graphic of Community Councils of Dagua made by members of the Council in the Workshop in La Delfina on 22nd of August, 2012

2.4. Interactions

2.4.1. Time allocation and level of specialization of stakeholders regarding the economic activities carried out in the study area

Time allocation varies depending on the composition of livelihoods for each territory. This aspect strongly influences the way in which families prioritize economic activities and allocation of time. For example, agricultural activities take place in some specific months of the year, according to ancestral and traditional knowledge of weather and soil conditions, so does mining. In other months, family members will be working as part of road construction teams, timber and non-forest products extraction, tourism and other activities, while other members will be permanently employed within or outside the territory.

In this way, community members combine different activities in order to satisfy their daily needs, so time devoted to each activity might change depending on the time of the year, new opportunities and the specific needs that may arise. Therefore, it could be fair to state that the level of specialization varies, depending on the specific conditions of every family, the time of the month, etc., and is limited by the absence of commercial options for the natural resources extracted.

2.4.2. Conflict among users

In the workshop carried out in August 2012, members of both Community Councils discussed the main conflicts or problems between inhabitants and between communities and other stakeholders in the territory.

Community Council of Dagua: The following main social conflicts are being perceived as problematic by community members: illegal mining, logging, pollution of water sources, pollution and contamination generated by infrastructure building, which is also linked to changes in landscape and ecosystems and the increasing presence of foreigners.

Among these, the main perceived source of conflict at the local level is illegal gold mining, which tends to create and promote conflicts not only among local users and foreigners but also among local families and neighbors. Illegal mining has not only promoted social conflict, but also has generated several harmful impacts in local natural resources. Water pollution is basically an environmental effect of gold mining, specifically because for gold extracting people need timber to build "socavones" (a system to modify the watercourse to obtain more sand and minerals from rivers when looking for gold). This conflict is common between neighbors and local inhabitants with foreigners. The big scale landscape changing is recognized as another source of social-environmental conflict, because local communities have to suffer and cope with the impact of infrastructure development without serious environmental impact studies.

Community Council of Calima: Five conflicts were identified: Coca leaves illegal production, deforestation and water contamination, illegal mining, and hunting. Members of this Community Council participating in the workshop coincided that the central conflict in this territory is about cultivation of coca leaves. This is an illegal activity involving three groups of actors. Local inhabitants cultivate coca leaves and sell it to intermediaries, which in turn process the leaves and export cocaine. Intermediation is a role exerted by illegal armed groups (guerrilla and paramilitaries). Government develops forced eradication programs using aerial spraying of coca crops with glyphosate and military actions in the territory. As a result of the interaction of these three groups of actors diverse impacts over the SES are perceived such as forced displacement, deforestation and contamination of water sources as a result of crops management and aerial spraying of coca plots.

The second conflicts in importance are deforestation and water contamination. Deforestation is a conflictive relationship observed among CVC, local actors and intermediaries. Because of a lack of opportunities and poverty, local actors continue extracting timber in a non-planned way which further affects the forest in this territory. Intermediaries commercialize the timber and other forest products.

Water contamination results from the interaction among local actors, transport operations, miners and illegal crops. River and road transport operations cause an important impact on water sources. Mining and illegal crops production impacts were described above.

Illegal mining is conducted in two levels. The artisanal way is conducted by local actors. At this level the impact over natural endowments is limited because of used artisanal tools. The second is a more industrial way using heavy machinery and chemical procedures which contaminates the rivers and destroys riverbeds. The CVC is the government institution in charge of devising policies and rules to control use of non-renewable resources. However, its control capacity is not sufficient enough as a result of limited resources and human capital, and illegal actors also involved in this activity.

Finally, hunting and illegal trade of biodiversity were mentioned. Although there are rules devised by the CVC to control this activity and the national police is in charge of interdicting illegal wildlife trafficking those activities continue affecting local biodiversity.



Photos 17 and 18. Matrices of conflicts of Community Councils of Calima and Dagua made by members of the Council in the Workshop in La Delfina on 22nd of August, 2012

3. A SWOT analysis for the case study

Stakeholders vision on strengths, weaknesses, opportunities and threats regarding the socio-ecological system and its governance in the territories of both Community Councils is presented next, based on the results derived from the stakeholders forum carried out in Buenaventura on 23rd of August 2012. This SWOT analysis takes into account five types of stakeholders who participated in this forum:

- Members of Community Councils: Calima, Dagua, Córdoba and San Cipriano. San Cipriano Foundation. Calima Verde Foundation.
- Local government stakeholders: Three offices of the Mayor of Buenaventura → Planning Office, Secretary of Economic and Rural Development, and Secretary of Coexistence for Civil Society.
- National, regional and local Environmental institutions: Alexander Von Humboldt Institute; Environmental Corporation of Valle del Cauca CVC; Secretary of Environment from Mayor Office of Buenaventura.

- Academic and education institutions: Tolima University, University of Pacífico, SENA, Education Institutions of Calima.
- NGOs: Social Pastoral, Pacífico Vivo Foundation, Ecobíos Foundation, PCN, Fundepav, Simbiosis, Fundelpa.

The strengths, the weaknesses, the opportunities and the threats are presented for each type of stakeholders, later a table with the common aspects is shown, and in the end some topics which are mentioned by one or two stakeholders are highlighted.

3.1. Strengths

Community Councils: Members of Community Councils say that the two main strengths of the **SES** of the Councils are their entitled territory and their population. The territory is rich in natural resources (forest, water, fauna and flora) and members of Community Council think that the inhabitants are committed to their preservation, taking into account natural cycles in their production systems and carrying out practises which are beneficial for the environment such as organic agriculture, eco-tourism, agro-forestry plots and nurseries for reforestation and forest enrichment. Members of Community Councils believe that sharing knowledge within and among communities is a strength they have benefiting their **governance** system. Participants also highlighted the importance of training programmes in which they have been involved.

Local government stakeholders: In terms of strengths of the **SES**, local government stakeholders identify community traditional knowledge and set of practices for the conservation of natural resources, which has been kept over generations and is part of their culture, as one of key local strengths. The geostrategic location of the councils is an important strength comprised by multiple resources, biodiversity, and rivers, which can also be used as means of communication and transportation. Other strengths come from their solid attachment to their land, the kindness of their people and the significant participation of women. An important strength related to **governance** is the organization and autonomy of CC, which enhances their capacity of decision making. This is also articulated to a strong leadership and an active participation on behalf of community members. These elements allow the councils to coordinate, regulate and plan the development and use of their territory. Finally, another strength comes from their knowledge of legislation, specially the one regulating CC in Colombia (Law 70). This knowledge positions them as valid and informed stakeholders.

National, regional and local Environmental institutions: These stakeholders state that main strengths of the **SES** are related to the abundance of biodiversity and water

resources in the region and a growing awareness among local communities about environmental services. A defined sense of place and belonging as well as attachment and identity are important cultural strengths highlighted by participants. The fact that the territory is collective and the Councils are recognized as authority within the territory is stated by the environmental institutions as an important governance strength. Furthermore, the existence of rules and norms, the team work between the CCs and some institutions, among other factors, have facilitated processes leading to current availability of Territorial Management Plans as well as the presence in the zone of officials from different governmental and non-governmental institutions.

Academic and education institutions: Members of academic and education institutions participating in the forum coincided in considering culture, as the most important social strength related to the **SES** in the Calima Council. In addition to this feature, social networks, based on strong family ties and social organizations, facilitate mobilization of diverse resources and communication among Council membership. Complementary strengths of the social dimension mentioned in the workshop include capacity to adapt to changes induced by internal and external forces, traditional knowledge about ecosystems, and livelihoods connected with the natural environment in diverse ways. As part of strengths belonging to the ecological dimension, participants highlighted an important availability of natural capital represented in hydro-ecological and biodiversity endowments. The Calima River is considered a structural connector of the territory, facilitating transport, connectivity, socialization, and an important element of the local culture. Members of academic and education institutions consider that a key strength of the **governance** in this territory is the availability of specific legislation governing the territory, such as specific sections of the National Constitution, the Law No.70, and the OIT Agreement No 169. The organization of the territory based on a cultural – ethnic approach and channeled by the CC was also highlighted as a central strength facilitating connectivity and collective decision making among public and private actors. Conservation of traditional knowledge on biodiversity and water and openness to new knowledge is a combination of factors that facilitates connectivity among local and external actors, channeling information and initiatives and, as a result, facilitating the capacity of the governance system to adapt to changes. Finally, availability of traditional informal institutions for conflict resolution and decision making is a key strength of the local governance system.

NGOs: In terms of strengths of the **SES**, NGO's representatives identify the high diversity of natural resources and the cultural richness associated with the use and management of these resources. The possibility of having the territory and the figure of the commons are

also strengths. Furthermore, they recognize that given the high biodiversity, people are able to develop a wide range of activities such as agricultural production, ecotourism, and preparing meals. An important strength related to governance is the organization and autonomy of the councils, which enhances their capacity of decision-making. Another important strength is the national recognition of the councils as an effective system to handle local natural resources. This is also articulated to a strong leadership and an active participation of community members. These elements allow the councils to coordinate, regulate and plan the development and use of their territory.

3.2. Weaknesses

Community Councils: Members of Community Councils stated that an important weakness of the **SES** is illegal hunting that some inhabitants practise in the territory. Participants also manifested that there is a lack of knowledge on some internal norms and on ethnical legislation as well as there has not been socio-ecological training for many members of Community Councils. These factors, together with poor communication between different actors within territories, represent a weakness of the **governance** system.

Local government stakeholders: A weaknesses of **the SES** that local government stakeholders perceive is a lack of technical knowledge regarding use and extraction of natural resources, especially in agriculture and mining, which often leads to contamination and deforestation. In addition, limited access to financial resources of local communities is also considered as an important weakness. Regarding **governance**, government stakeholders identify a lack of rotation among leaders, and therefore, a weak transference of the *know-how* of leadership and administrative skills to other community members. They also observe the prioritization of individual interests of local leaders over collective interests, which can be considered as a source of internal conflicts. Also, there is a perception of a lack of abilities regarding capacity to improve and create new relationships with external actors, such as government, in order to negotiate and advocate for their interests.

National, regional and local Environmental institutions: These stakeholders perceive that **SES** of both Community Councils has cultural, economic and institutional weaknesses. They consider that there is cultural fragmentation in the territory and there is little economic valuation of the biodiversity and water resources. These facts imply that investments in conservation and management activities is low, and there are few alternatives for efficient resources management.. Also, members of environmental institutions consider that local stakeholders do not participate in the process of policy

making. Coinciding with Community Councils, environmental institutions consider that there is not enough information and training on ecological, biodiversity and water dynamics. Finally, many studies conducted in both CC have had little applicability. Limited coordination among public and private institutions and between communities and academia was perceived as the main weakness regarding territorial **governance** systems. Institutional representatives instability, and the fact that the real meaning of participation is unknown for many institutions, were considered as important aspects affecting local governance systems.

Academic and education institutions: Members of academic and education institutions participating in the forum considered that migration, particularly of youth, is one of the most important weaknesses of the **SES** in this territory. As the social structure erodes because of this factor, it is difficult to transfer traditional knowledge and maintain the balance of SES. Furthermore, young people struggle to access higher levels of technical education in order to acquire technical knowledge to support their communities and preserve their natural environment. These problems are exacerbated by limited availability of economic resources, still weak organizational structures, and limited knowledge about legislation. Low self-esteem was also pointed out as a factor that impedes a more rapid access to diverse capitals, higher levels of education and organizational. Four important **governance** systems weaknesses were described by members of academic and education institutions. First, there is a conflict between national policies, such as the important government support to develop mining, and regional policies and initiatives. Mining is not considered a development factor in this region, but a factor of destruction of SES and natural endowments. Second, as a result of these contradictory policies, poverty, and limited opportunities for local communities, there is a diversity of conflicts of use of natural resources. These conflicts do not facilitate further development of the governance system in the territory. Third, illegal activities are an economic muscle of paramilitary and guerrilla groups, which weakens the governance system and propels forced displacement and youth out – migration. Finally, these factors were considered as important obstacles for local leaders and social organizations which further impact the governance system capacity to adapt and evolve.

NGOs: In terms of weaknesses of **SES**, members of NGOs identify a decreasing of soil fertility, expansion of agricultural frontier, cultural erosion and harmful changes in landscape and some ecosystems. Regarding **governance**, local NGO's identify fragility of the social organization in order to face illegal actors and mining companies. They also observe the lack of effective "win-to-win" relations with governmental institutions.

3.3. Opportunities

Community Councils: From CC perspective, the presence of many institutions in the region, particularly universities, is a key opportunity to properly orient the governance of the SES in their territories. The Territory Management Plan ("Plan de ordenamiento territorial") could be an opportunity for the Councils, although there is a discussion about if this is a real opportunity or if it could be instead a threat. Similar to other stakeholders, legislation, such as Law 70 of 1993, Decree 1745 of 1995 and Convention 169 of International Labour Organization, is considered as an opportunity for the management of the territory.

Local government stakeholders: In terms of the **SES**, the closeness of the territory of both Community Councils to one of the most important Colombian ports creates endless possibilities of commercializing different kind of resources. This is linked to other economic opportunities such as eco-tourism. Development of legislation (e.g. Law 70 of 1993), could bring important possibilities for strengthening Community Councils and enhancing a most effective regulation for the conservation of ecosystems, benefiting in turn local **governance** systems. Furthermore, existence of external allies, both national and international, is also an opportunity that could bring new tools, knowledge and resources to the councils. The active role of women is also seen as an opportunity, for women are perceived as promoting and driving development within their communities.

National, regional and local Environmental institutions: The opportunities that these stakeholders highlight regarding **SES** are related to the National Policy and to the biodiversity visibility issue. Firstly, there has been a change in the National Policy on Biodiversity which opens new spaces for discussion and interlocution. Secondly, there is a greater local, national and international visibility of the bio-diverse region and the importance of the local communities (Community Councils) and their traditional sustainable management. These two issues are also opportunities for local **governance** systems, which are reflected in the team work created between different Community Councils and in the growing interest to increase knowledge about how Community Councils manage their territories.

Academic and education institutions: As part of the opportunities of **SES**, members of academic and education institutions agreed in mentioning a wide offer of environmental endowments and closeness to the sea as the most important. The size of the Calima territory includes a diversity of SES which has not been studied consistently. Diverse social organizations, led by Community Councils provide an important support to local communities and orient the process of development in this territory. Furthermore,

Community Councils are step by step strengthening organizational connectivity and working on inter-institutional relationships and communication. Several national, regional and local organizations are conducting research in tropical forest which will facilitate a deeper understanding of SES. Some institutions such as SENA, the University of Pacífico, and Javeriana University are working in the area facilitating formation of human capital through scientific research, and formal and technical education. The **governance** system in this territory has important opportunities reflected in ongoing agreements among C.C. This process will facilitate further strengthening of the social structure and their capacity to face internal and external destabilizing factors. On the other hand, these agreements are also involving, among others, indigenous communities, and urban communities and organizations, further facilitating governance system's capacity to evolve and face internal and external forces of change. Furthermore, this important social activity is facilitating an intercultural dialog and participation in new activities, programs and projects.

NGOs: Members of local NGOs think that the closeness of the Community Councils territories to the most important Colombian port in the Pacific Coast (Buenaventura) creates endless possibilities of commercializing different kind of resources. This is linked to other opportunities of productive alternatives, such as eco-tourism. One opportunity to **governance** comes from the community empowerment generated by the legislation (Law 70). Also, the existence of a variety of stakeholders interested in local communities helps to establish a broad set of "partners" or allies to develop international cooperation projects.

3.4. Threats

Community Councils: According to members of Community Councils, the **SES** is threatened by the illicit crops, armed conflict, non-planning mining and mining licensing, environmental licenses given by the State, deforestation and free movement of people from outside the region. Although members of the Community Councils recognize that the existence of legislation and the presence of institutions such as universities could be an opportunity for the **governance**, as was mentioned above, at the same time they believe that the main threats for the governance come from the lack of regulation of the law 70, the lack of support from the government, some institutions and some local and regional universities, as well as from the lack of business support for micro-enterprises. They also state that there has not been enough training for them in order to carry out good governance.

Local government stakeholders: The threats for the **SES** are related to the negative environmental impacts of industrial mining, which is also linked to the "invasion" of external actors led by extractive interests. The presence of illegal armed groups and illegal crops in some parts of the councils' territory are also a significant threat to socio-ecological systems. Illegal crops also come with aerial fumigation, causing contamination of the water and soil. As a result, erosion is also a threat. Regarding **governance**, government stakeholders identify a lack of commitment from the local, regional and national government towards the cooperation with Community councils. They also warn about the existence of external groups of interests, especially those wanting to implement industrial mining in the region, and therefore threatening the full control and regulation of the councils over their land. In addition, the presence of illegal armed groups is one of the most complex and significant threat, since it undermines not only their governance but their existence and permanence. The lack of training and educational opportunities for leaders and other community members is also a threat to the development of their governance.

National, regional and local Environmental institutions: Similar to other stakeholders, these institutions think that the armed conflict, violence, the illicit crops, fumigations and illegal mining are important threats for both the **SES** and their **governance**. They also mention that there are actors with interests wanting to delegitimize the law 70 in terms of they think that inhabitants or community councils are not able to manage their territories and to take good decisions on them.

Academic and education institutions: Several important factors threatening **SES** were mentioned by members of academic and education institutions. First, Illegal crops (coca leaves production) and illegal extraction of natural resources (mining and logging) are generating an important impact over the **SES**. Among other impacts, participants highlighted deforestation, contamination of water sources, landscape degradation, and social impacts. Second, effects of climate change are already being noticed in this territory. More frequent storms, flooding, and droughts are changing local climate conditions, affecting connectivity of **SES**, transforming production systems and pressing some important community features such as livelihoods. Third, loss of traditional knowledge was considered an important factor threatening transmission of knowledge about **SES**. Finally, contamination of rivers, corruption in public institutions and agro- industrial and port infrastructure macro projects were also mentioned as key processes threatening stability and future of **SES** in this territory. The **governance** system in this territory faces important threats. One of the most important is a crisis in traditional forms of government as a result of corruption processes further eroding their authority and capacity to enhance

formal rules to control destruction of natural endowments and diminishing effectiveness in application of laws and norms. In this context, emergence of new formal institutions such as the CC generates new forms of conflicts, for example between the CC and municipal governments. Finally, there is a strong influence of economic interests over common use resources.

NGOs: Members of NGOs think that the main threats to **SESSs** are related to the negative environmental impacts of industrial mining, fragility of the institutional process and biodiversity losses. Regarding governance, NGO's stakeholders identify as a threat the lack of conscience about the importance of the natural resources maintenance and the general national perception about natural resources in the pacific coast as a "never ending" source of commodities. Also, the participants perceive the forced displacement and the disruption of public order as big struggles at the local level.

Next table shows the common views having by different stakeholders regarding SWOT analysis.

Table 4. Summary of common stakeholders' perceptions on SWOT

<p style="text-align: center;">Strengths</p> <ul style="list-style-type: none"> -Community knowledge and set of practices for the conservation of natural resources -Local communities sense of place and belonging (culture and identity) -Collective territory → autonomy for coordinating, regulating and planning development processes and forms of use of their territory (Article 3 of Law 70 of 1993). Strategic location of the territory. -Knowledge of legislation and permanent training of the leaders. - Abundance of biodiversity and water resources. - Diverse forms of relationships among public and private, and local and external actors enhance emergent governance systems in both Community Councils territories. 	<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> -Formal recognition of biodiversity and collective territories for black communities through Law 70 of 1993 and Environmental National Policy. - Articulated work among community councils. - Importance of external allies interested in biodiversity and SES CC management and traditional knowledge. (e.g. universities and international cooperation agencies). - External and internal support for training and formation of human capital.
<p style="text-align: center;">Weaknesses</p> <ul style="list-style-type: none"> - Conflicting views among stakeholders regarding natural endowments and the way they could be used. -Weak communication and relationship between communities and external actors. - Conflict and contradictions between national policies and regional and local policies and initiatives, especially in terms of social aspects and economic activities such as mining. -Lack of technical knowledge on biodiversity and natural resources in general. -Issues regarding public participation within Community Councils and weak transfer of leadership. - Changes and fragmentation of landscape and ecological systems (e.g. decreasing of soil fertility, expansion of agricultural frontiers). 	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none"> -Illicit crops - aerial fumigation -Armed conflict and forced displacement of population -Illegal mining -Licensing for mining exploration -Macro projects and agro-industrial projects. -Lack of regulation of the law 70 → Deligitimation of autonomy capacity to manage their territory, taking into account the threats mentioned above.

Some stakeholders mentioned specific aspects, which other stakeholders did not put on the table. For instance, local government stakeholders mentioned the importance of the role of women in the community councils and in the making decision processes and they are perceived as promoting and driving development within their communities (strength and opportunity).

Academic institutions stated that intercultural dialogue is a key factor to facilitate the participation of communities in new activities, programs and projects. However, they state that a weakness is the migration of young people which is related to low access to technical and professional training and cause problems to transfer of traditions and culture within communities. Academic and education institutions are the only stakeholder who mentioned evidences of climate change in the territory, such as more frequent storms, floodings and droughts. Nevertheless issues regarding climate change were more clearly manifested in field work activities. Academic and education institutions and the local government coincided in that corruption is a factor which has eroded the local capacity to control destruction of natural endowments.

Finally, national, regional and local environmental institutions think that there is cultural fragmentation in the territory, and this, together with little economic valuation of the biodiversity and water resources, implies that investments in conservation and management activities is low, and that there are few alternatives for an efficient management of resources. Also, they state that there are scientific studies that are not being applied to the territory.



Photos 19 and 20. Examples of SWOT matrices made by stakeholders in the Forum in Buenaventura on 23rd of August, 2012

Conclusions

1. Socio-ecological systems: Although stakeholders reflect understanding of components of this concept, it is in general a new debate introduced by the project in Community Councils territories. In consequence, at this preliminary stage our efforts were oriented to reinforce its understanding by co-researchers team and local community members. In general, perceptions of sub-components of this concept include a view of local communities as marginalized and fragile, facing diverse impacts resulting from road and port macro-projects, mining, illegal crops and violence. On the other hand, perceptions on the ecological subsystems reflect a view that struggles between sustainable use based on traditional knowledge and external pressures leading to overexploitation and extinction of species. Future work will be focused on an in-depth analysis of these conflicting forces and the way they are affecting SES, detailed reading of subcomponents in a sample of local communities, and a construction of its interpretation with the co-researchers team.

For the Community Councils, territory in general, and the biodiversity and water resources in particular, is seen as a place of identity. This is reflected in the interest of learning and formation processes and in searching information regarding how ecosystems work. This interest goes together with political struggle that the Community Councils have done to get autonomy to manage their territory, which has strengthened their governance capacity.

2. The governance system: There is an emergent process of the overall territory governance system. As a result of that, specific governance systems on water and biodiversity are in a transition process and will be affected by the diverse composition of stakeholders participants and the complex policy network permeating this process. Local perspectives on governance are still focused on control and the way Community Councils are governing their territories. Nevertheless, several factors affecting territorial governance systems were described. For example, it was clear that conservation of traditional knowledge on biodiversity and water and openness to new knowledge is a combination of factors that facilitates connectivity among local and external actors, channeling information and initiatives and, as a result, facilitating the capacity of the governance system to adapt to changes. The work ahead includes disentangling the role of public and private stakeholders, mapping forms of interactions among them, and précising characterization of the governance structure and functions.

Furthermore, internal and external stakeholders recognize the importance of law 70 of 1993 as legal framework that strengths black communities autonomy. However, stakeholders perceive that there are interests which could put in risk the management

capacity of Community Councils. In consequence, it is necessary to continue accompanying training and formation processes for territory management.

Some stakeholders highlight the relevant participation of women in the governance processes. However, it is necessary to carry out an in-depth analysis about women's perceptions on socio-ecological systems (biodiversity and water resources) and governance, and how the gender relationships are involved in this.

3. Perception on climate change: As mentioned above, collection of local perceptions (stakeholders and population of different ages and sex) on climate change and the way it affects water, biodiversity and SES will take place through later steps of the proposed methodological approach. However, field work conducted so far permitted identification of more frequent storms, flooding, and droughts changing local climate conditions, accelerating transformation of forest, water beds and biodiversity composition further affecting connectivity of SES, transforming production systems, and pressing some important community features such as livelihoods. In consequence, future work includes a more detailed exploration of local perceptions on this issue and triangulation with biophysical studies and information produced by IDEAM.

4. About the methodological approach: An important contribution from the Colombian case to the methodological approach in the project is the calling to establish in each case a set of possible subcategories to define smaller units of analysis. According to the overall COMET-LA framework, the main natural resources in the Colombian case are "water" and "biodiversity". However, water and biodiversity are not by themselves social-ecological systems, but variables that will allow us to identify key sub-systems to understand through them the specificities and particularities of the whole system. This process, from the specific to the broader picture, will help us to finally integrate all the information and findings of the general social-ecological system in the collective common land studied.

For example, connected with the "water" variable we identified different components of local livelihoods to be analyzed. Those components are mining, agriculture, use of water sources and waterways used for transportation, recreation and also tourism, all of them managed from the villages. As a result, a sample of local villages will be used as the starting point to develop analysis of SES.

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Appendices

Appendix 1. Description of Participatory Rural Appraisal (PRA) tools

Some of the PRA tools which have been used and will be used in COMET-LA to analyze SES and the governance system (SG) of the Pacific region and how the climate change affects them are:

- **Productive profile:** This tool allows identifying the main productive activities and livelihoods of population and to what extent communities depend economically on natural resources.
- **Historical Graphic:** It seek to analyse the community perception about the changes of natural resources and the relationship between this with transformations in population, institutions, social organizations and productive activities, among other aspects.
- **Venn Diagram:** The objective of this tool is to identify the perception of stakeholders regarding organizations and institutions present in the region, the relationship and conflicts between them and communities. This diagram identifies social networks and the perception that people have on institutions regulating the natural resources.
- **Matrix of rules and norms:** This matrix allows identifying both the internal and external rules and norms regarding natural resources management within communities. Also, shows to what extent these rules are met and how the stakeholders perceive the efficiency of the norms to a good management or natural resources.
- **Matrix of conflict analysis:** This tool is useful in order to analyse the different socio-environmental conflicts present within communities, the stakeholders participating in those and the mechanisms to resolve them.
- **Matrix of individual and collective actions to natural resources management:** Its objective is to identify the actions carried out by stakeholders to good management of natural resources (e.g. water, biodiversity, forestry, and so on). This tool allows identifying if these actions are individual within private properties or if they are collective within common use areas.
- **Social mapping - maps "yesterday - today - tomorrow":** This is a process in which inhabitants build maps of their territories, allowing reflection on the use of natural resources, the attachment to the territory, cultural expressions, among other issue, observing and writing on maps what happens in the past, what is happening in the present and what is expecting for the future within the territory.
- **Transects:** They are graphics representing a walk within the territory. Transect identifies different aspects of the territory (e.g. vegetal species, types of soils, etc.).
- **SWOT matrix:** It identifies the strengths, weaknesses, opportunities and threats perceived by stakeholders regarding SES and the governance of their territory.

In order to get the differential perspective of women and men, it could be useful to apply these tools with separate groups of women and men, or to ask explicit questions about the participation of women and men in the different topics and how the relationship between women and men happens in specific aspects.

Appendix 2. Attendees list - Workshop with members of both Community Councils on 22nd of August 2012 in the meeting center of community council of Dagua ("La Delfina")

Sex	Organization	Community Council or city or country
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Male	CC Calima	Calima
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	FUNDAPAV	Buenaventura
Female	FUNDAPAV	Buenaventura
Male	FUNDAPAV	Buenaventura
Male	Aquamarina	Argentina
Female	Universidad Nacional del Sur	Argentina
Female	Universidad Nacional del Sur	Argentina
Male	IADO - UMS	Argentina
Male	Sagremarisco	Portugal
Female	NILU	Norway
Female	CeUICN	Spain
Female	CeUICN	Spain
Male	UCO	Spain
Female	UCO	Spain
Male	UNAM	Mexico
Female	Instituto Von Humboldt	Colombia

Sex	Organization	Community Council or city or country
Female	PUJ	Colombia
Female	PUJ	Colombia
Female	PUJ	Colombia
Male	PUJ	Colombia
Male	PUJ	Colombia

Appendix 3. Attendees list - Stakeholders forum on 23rd of August 2012 in Buenaventura

Sex	Organization	Community Council or city or country
Male	Fundación Agroesop	Buenaventura
Female	Fundación Agroesop	Buenaventura
Male	Fundación Puerto Aguadulce	Buenaventura
Female	FUNDAPAV	Buenaventura
Female	FUNDAPAV	Buenaventura
Female	FUNDAPAV	Buenaventura
Female	FUNDAPAV	Buenaventura
Male	FUNDAPAV	Buenaventura
Male	FUNDAPAV	Buenaventura
Male	Noticiero más Noticias	Buenaventura
Male	Fedempacífico	Buenaventura
Male	Fundación Ecobios	Buenaventura
Male	Fundación Ecobios	Buenaventura
Male	Alcaldía	Buenaventura
Male	Alcaldía	Buenaventura
Male	Alcaldía	Buenaventura
Male	Alcaldía	Buenaventura
Male	Alcaldía	Buenaventura
Female	Alcaldía	Buenaventura
Female	Alcaldía	Buenaventura
Female	Alcaldía	Buenaventura
Female	Instituto Von Humboldt	Colombia
Male	Universidad del Pacífico	Buenaventura
Male	SENA	Buenaventura
Female	Universidad del Tolima	Colombia
Female	Universidad del Tolima	Colombia
Male	Universidad del Tolima	Colombia
Male	Universidad del Tolima	Colombia
Male	Universidad del Tolima	Colombia
Male	Universidad del Tolima	Colombia
Male	Universidad del Tolima	Colombia
Male	Universidad del Tolima	Colombia
Male	Universidad del Tolima	Colombia
Male	Fundación Simbiosis	Buenaventura
Female	Control Forestal Tropical	Buenaventura
Female	Fundelpa	Colombia
Male	CVC - DARPO	Colombia
Female	CVC	Buenaventura
Female	Cámara de Comercio	Buenaventura

Sex	Organization	Community Council or city or country
Male	CC Calima	Buenaventura
Male	CC Calima	Buenaventura
Male	CC Calima	Buenaventura
Male	CC Calima	Buenaventura
Male	CC Calima	Buenaventura
Male	CC Calima	Buenaventura
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Female	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	CC Dagua	Dagua
Male	Aquamarina	Argentina
Female	Universidad Nacional del Sur	Argentina
Female	Universidad Nacional del Sur	Argentina
Male	IADO - UMS	Argentina
Male	Sagremarisco	Portugal
Female	NILU	Norway
Female	CeUICN	Spain
Female	CeUICN	Spain
Male	UCO	Spain
Female	UCO	Spain
Male	UNAM	Mexico
Female	PUJ	Colombia
Female	PUJ	Colombia
Female	PUJ	Colombia
Male	PUJ	Colombia
Male	PUJ	Colombia

Appendix 4. Ethical considerations checklist

(1) Issues to consider for introducing the project & obtaining consent to engage with project activities

Consideration	Yes	No
Have you considered how participants will be informed about the planned activities and their purpose?	x	
<p>We have elaborated two informative brochures (in Spanish), one presenting a general overview of the COMET LA Project and another providing specific information about the Colombian Case and the Community Councils. These have been handed out to all participants in previous workshops.</p> <p>Additionally, every meeting/workshop starts with a contextualization presenting the Project, the specific objective of the event, and the activities that will be developed. The approach and communication channel between the Universidad Javeriana and the Community Councils will always be conducted through the legal representatives and co-researchers, so both parties will be fully informed and can engage in a joint decision process around the activities and issues within the Project.</p>		
Have you considered how consent to participation will be indicated?	x	
<p>All the workshops, meetings and forums will start with the reading of the informed consent (see appendix 5). If any questions or objections arise, they will be reported and filed. The declaration of consent will be expressed orally and not written. This has been decided based on the fact that within the Colombian culture, asking for a signature might be seen as a having social and legal implications, which might cause suspicion rather than promoting a clear ethical statement around the Project.</p> <p>For the specific case of co-researchers, consent has been already given and has been validated by participants and Community Councils, since they have been selected and approved by Community Councils to participate in the research process.</p>		
Will the activity involve participants who are not adult (as locally defined) who are unable to give informed consent?	x	
<p>If required, each Community Council, through an autonomous and internal decision making process, will design the strategy for obtaining the proper consent from parents and community members, so minors could be ethically involved.</p>		
Does the research involve other vulnerable groups: children, those with cognitive impairment, or where unequal relationships may exist that could affect responses and perceived freedom to cooperate? (e.g. disempowered groups, ethnic minorities)?	x	
<p>The Colombian chapter of the Project works with two black communities, which are considered an ethnic minority in the Country, although for the specific region to be studied, they are a majoritarian demographic group. Black Communities are covered by a special legislation (Law 70, 1993). It guarantees their autonomy over their territory. The initial discussion under the COMET-LA Project and its initial implementation, have been framed into this scenario. Therefore, all the activities and results of the research will consider the autonomy and active participation of the Community Councils.</p> <p>We aim to keep an interaction channel through dialogue and permanent communication, in order to guarantee timely effective responses, among the difficulties of the organizational contexts and the specific organizational dynamics taking place in the territory.</p>		
Will the study require the co-operation of a 'gatekeeper' for initial access to the groups or individuals to be recruited? (e.g. students at school, members of self-help group, community leaders?)	x	
<p>The "gate keepers" are leaders from the Community Councils, who were consulted from</p>		

<p>the beginning of the Project about the intention of them being partners. They have and will be participating actively, together with other community members in various activities. Another important gate keeper is a professor from the SENA (an Education State Institution) and a member of a non-governmental organization, who has closely supported Community Councils, gathering an extensive expertise and knowledge about the different elements affecting councils. This person has also a very close relationship with the research team of the Universidad Javeriana, and has been engaged in the planning process so far.</p> <p>The individual stands of this person will not be reflected in aspects related to governance and activities that might be linked to the autonomy of Community Councils. His participation is framed into generating the proper conditions for the implementation of activities, providing the opportunity to consolidate organizational processes and acknowledge local experiences <i>vis á vis</i> global scenarios.</p>		
Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g. covert observation of people in non-public places)?	x	
<p>This will be determined according to the methodological dynamic established with the Community Councils, which can judge on the convenience and limits of this type of intervention.</p>		
Can you foresee any other ethical problems during the design and planning stage?		x

(2) Issues to consider for planning data collection, and participant involvement in project activities

Consideration	yes	No
Is there a possibility that the safety of the researchers and COMET-LA project staff may be in question (e.g. exposure to physical risks, discussion of contentious political or ownership issues)?		x
<p>All the necessary measures will be taken in order to guarantee that the activities and field visits are safe and without risks. In that case, the Councils and their representatives are the proper consultants in planning and implementing activities within the Project.</p>		
Is there a possibility that the safety of the participants may be at risk due to the project activities (e.g. due to exposure to physical risks, due to discrimination from other groups)?		x
<p><i>If yes how will these dangers be eliminated or reduced?</i></p>		
Could the project plan change, or could the activity involve the sharing of data or confidential information beyond the initial consent given?	x	
<p>In case the Project faces any change, due to contingencies of the context, it is important to state that this would only proceed with the previous consent and authorization of the Community Councils, through their representatives and governance units.</p>		
Could participants withhold or alter their involvement because of repercussions they perceive? For example, will culturally sensitive or legal topics be discussed?	x	
<p>In regard to cultural or legal subjects, it is always necessary to provide enough time for discussion, socialization and agreement, under a principle of proper representation of the Councils.</p>		
Can you foresee any other ethical problems arising during project activities?		x

(3) Issues to consider after an activity: data analysis. Dissemination of project findings & outputs

Consideration	Yes	No
Will all contributions to the research be acknowledged? (is there a record of what those acknowledgments ought to be)	x	
<p>All the meetings/workshops/ forums will have a list of participants. Additionally, all the products, notes and reports will specify how the information has been obtained, when and who participated.</p> <p>The contributions of the local co-researchers will be acknowledged in the products, specifying their names and the type of contribution. The contribution of the Community Councils as a whole will also be acknowledged.</p>		
Will there be mechanisms for ensuring participants' feedback have been established?	x	
<p>All the products, notes and reports will be traduced to Spanish and be sent to the leaders and co-researchers of the Community Councils, in order for them to offer a feedback. During workshops and field visits, there will always be a time for showing and discussing the systematization and analysis of the information (gathered by co-researchers or professors from the Universidad Javeriana)</p>		
Will participants have good access and awareness to outputs they have contributed to?	x	
<p>During workshops and field visits there will always be a time for showing and discussing the systematization and analysis of the information (gathered by co-researchers or professors from the Universidad Javeriana). The deliverables sent to the European Union will be translated into Spanish. All the information will also be available in the Project web page.</p>		
Will data be confidential to the individual/group that created it, or shared more widely (e.g. within the community)?	x	
<p>Unless a participant expresses explicitly that the information being provided cannot be shared or has to be kept under restricted privacy, all the data that is pertinent to the Project will be published. For example, both Councils currently hold information and diagnosis about their socio-ecological systems, but is still not available for the public. In this case, only after the Councils publish this information and officially authorize its use, the Project cannot use this data for any products or reports.</p>		
Even if outputs and findings are anonymised, are there any risks to the group(s) that created it (e.g. disfavourable reactions from another group or agency towards the community or a group within the community)?		x
Can you foresee any other ethical problems arising from the use of the project outputs?		x

Appendix 5. Format of Informed Consent



Community-based Management of Environmental challenges in Latin America



INFORMED CONSENT

Place and date: _____

You have been invited to participate in this workshop of the COMET-LA Project, whose purpose is to analyze socio-ecological systems and governance. Your participation is truly important for the development of the Project, especially because you are the people managing natural resources. Your participation will also enhance a collective learning process among various stakeholders.

The information provided by you within this workshop, both in singular group discussion and full meeting sessions will be **kept in private and will be used exclusively for academic purposes**. The coordinating teams of the Project (Universidad Javeriana and the Community Councils) are committed to return the report of this workshop to the participants here present, in order to get feedback from their opinions and comments.

The approximate length of the workshop is 4 hours. Your participation is completely voluntary and you are able to leave the workshop when you desire.

In this specific moment we ask the people who agree on the terms presented above to raise their hands.

Number of people who express their consent: _____

Total number of participants: _____

Signatures:

Maria Adelaida Farah Q.
Project Coordinator
Colombia
Universidad Javeriana

Sebastián Moreno
Legal Representative of Calima

Manuel Riascos
Legal Representative of Dagua

