

# Tourism and Natural Infrastructure in the Community Agua Blanca, Puerto Lopez, Manabi - Ecuador

December 7, 2018

## 1 Static Analysis - Collective action

Agua Blanca Community is located in the province of Manab, in the municipality of Puerto Lopez, Machalilla parish. The community, founded in 1930, is within the Machalilla National Park, and occupies an area of 10,500 hectares. It is made up of approximately 80 families, that is, almost 300 people. It possesses one of the largest archaeological settlements on the coast related to the mantee culture (800-1532 AD). The community has historically conducted activities in agriculture and livestock, especially extraction of products that can be obtained from the cloudy dry forest. Recently, its inhabitants have dedicated to offering tourism services as an alternative for community development.

This study case focuses on institutional performance of the Community Agua Blanca. Previously, the community has been studied as a unit of tourism and the economic development in the community thanks to tourism. [1]. This present work uses the comparative analyses regarding Ostrom's Design Principles to analyze the institution framework. Community Agua Blanca represents in some sense a case of institutional failure, under the conditions and perspectives of development and generation of income.

The key resource relevant to the commons dilemma faced by the community is the natural infrastructure, punctually the dry forest and also land under property of the community.

### 1.1 The Commons Dilemma

The common pool resource for Agua Blanca is the forest and land. The forest is part of the tropical dry forest of national park Machalilla which, is considered as a priority for conservation within the country. The park is important because of its biological, scientific and cultural importance [2]. Land is explicitly held as communal lands which entitles the community for its use and conservation without any capacity for selling or renting it for purposes different than the ones established in the goals of the community. The use of all natural infrastructure in the community faces an over appropriation dilemma. The community has been able to maintain the natural infrastructure and this small-scale system of services for tourism through several rules established and approved by the community.

The goal established by the community is to preserve the forest as it is the source of provision of food, shelter and raw materials. The benefits of the use of natural resources have to

be shared with the community and a set of internal regulations establishes the proper use of the. However, there exists poor mechanisms of monitoring and self-enforcement of the rules which, might be aggravated by the state of poverty among almost all families which, might be a central aspect to understand the institutional framework of the community. There exist rules to control over appropriation and they are generally maintaining and respected, even though there is perception of unfairness of rules in the community.

Another key element of analysis is the extremely poor coordination of actions. The experience of the Agua Blanca community allows us to study an enriching environment of an economy in transition and the power relations within this human group. Agua Blanca is a community with a very basic productive structure, characterized by agricultural activities and trying to make a transition towards a service economy, in this case towards tourism services. This transition is slow and very uncoordinated. The concept of community tourism is adjusted to the scope of the solidarity relations of the community and attempts to maximize subsistence. Its members do not have a common goal towards the maximization of service and from a distance, the maximization of utility.

In this last part it is important to open the space to address the issues of economic efficiency. This is a community with a great scarcity of physical resources and human talent, not of natural resources. Agua Blanca's economy has connections between its wealth generating activities that are very weak and in many cases non-existent. These ways of operating can punish the efficiency of the model because no faults are recognized and corrected. The community captures rents of the reputation of the place, as well as its historical trajectory but no efforts are identified to return to this efficient and effective model. The relationships identified by the input-output matrix present an agricultural environment and not so much as an area of services at the tourism level.

Every person has to conduct an activity and free riding is not a social acceptable condition. However, there is a high potential for free riding due to the existence of a large amount of land and forest which does not receive any attention and, the roads and infrastructure for touristic purposes is deteriorated and lack of investment in accommodation also makes families to postpone renovations or improvements in physical infrastructure. Free rider problem: extraction of resources or rent seeking from the name of the community. Agua Blanca is an emblematic and historic case of a community offering touristic services and villagers might be profiting from this name but the quality of the infrastructure and service has not had a differentiated jump of excellency. This might have become a norm that incentivizes a potential concern for free riding behavior.

Poverty is a key characteristic to understand how initial conditions might threaten any institutional success. The over appropriation becomes further complicated when families attempt to overcome poverty or at least, alleviate daily necessities, through the over use of the resource. But very punctually, the problem is not just the intensity of the over use but the speed of the use or over use- of the resources because the families sense the ability to do more to regain all the wasted time and resources and the threat of hyper over exploitation comes to place. The sense of fairness within the community is also threatened due to the inconsistencies of the application of internal laws which, do have an impact on the quality of life of villagers.

## 1.2 Biophysical Context (IAD)

This is a small community comprised by several dozens of families. They are entitled as the preservers of the natural dry forest and they have strict rules on how to accept someone in the community. They for example, tend to marry people from the same families in the community, making it harder for foreign people to come and be part of it. The community has to be aware about who might be the potential bride or groom and then, the community gets involved in the decision about marriage. Otherwise, young people leave the place if they search for alternatives. The reason why the community gets involved is to monitor and control the population pressure over resource use, specially land because the new couple has to receive a piece of land with right of usufruct and this might push the urbanization boundaries beyond what the National Park Machalilla allows.

Natural infrastructure for Agua Blanca has defined boundaries since, it is comprised by an area of 15 thousand hectares of tropical dry forest and additionally, every villager possesses a lot of land which is entitled for the family dwelling, own crop, animal tenancy, etc. This natural infrastructure does not facilitate monitoring because it is an extensive piece of land and there are not really funds to pay for continuous monitoring.

Forest is abundant and it faces two main seasonal periods with the dry and wet season. The most abundant tree species include barbasco, ceibo, algarrobo, muyuyo, and palo santo. Palo santo has a special place in the aspects of the community because it provides the raw material for incense, oil production, perfumes, folk medicines and basic handcraft activities. The resource flows from the resource system are basically units of information, from activities of tourism, and also units of forest in the form of tree harvesting, obtained for basic manufacturing purposes.

### 1.2.1 Hard human-made infrastructure:

- Roads. There exist a limited amount of internal roads, constructed with pavement. The majority of kilometers are dust roads and they were constructed by the municipality and some others, by the community. Most of pathways to houses and huts of community members are dust roads.
- Entrance. The main and unique entrance to Agua Blanca was constructed by the community and it is the point of control for tourists. This is also the place where tourists pay for the entrance fee to the community.
- Facilities for accommodation. The hosting service is provided by 23 families with a capacity to accommodate 40 people. Of these families only 5 do not guide, that is to say that within the same family nucleus more than one member of the family is dedicated to the tourist activity. In addition, they have a camping area with a capacity of 200 people. From the lodging service, each family charges 10 dollars per guest, of which 0.50 cents are destined to the communal funds. The rooms for accommodation are normal rooms of the family, adjusted a little bit more, to offer accommodation for tourists. The central idea is that tourists become part of the family for the time they spend in Agua Blanca, helping them with food preparation, harvesting of wood and fruits, house chores, etc.

- Houses. The houses in the community are built by the community and the majority are constructed with mixed elements of cement and wood.
- Restaurant. The food service is carried out through two restaurants that the community has. The first restaurant is community and is part of the allocations of productive activities to generate income. The second restaurant is private and belongs to the family of the president of the Community. The community restaurant was built with communal funds and handed over to one of the comuneros administration and management. All personnel required to attend the restaurant are hired from the same community. The restaurant contributes to the community with 0.10 cents for each dish sold. The prices range between 3.50 to 6.50 dollars and 0.15 cents of the price is set aside in a fund to be used to maintain the restaurant. These 0.15 cents remain in the hands of the same administrator, being his obligation to keep the restaurant in good condition.

The private restaurant does not contribute economically to the community since its construction and management is private and no communal funds were used for construction, likewise the workforce is familiar. According to the president of the Community, the two restaurants do not compete with each other, but do not want more restaurants since the level of demand does not warrant it.

- Oil manufacturing plant. Additionally, there is an incipient industrial activity related to palo santo, its oil is extracted, body products are elaborated as corporal spray, talc, incense. However, there is no cost calculation to establish prices, they simply establish it based on the prices in which it is marketed in the sector, but always reducing its sale value a little. A very important aspect to understand the biophysical context is the existence of the palo santo tree, *Bursera Graveolens*. This is a native plant that grows on the edges of streams facing the sea and in low and middle mountains on the Ecuadorian and Peruvian coasts. It is also a tree native to Yucatan (Mexico). Peru and Venezuela. It has been used since ancient times as a remedy to cure stomach pains, sudorific, as a liniment for rheumatism. Dry wood is used to burn it and to scare mosquitoes. By burning the dry log you get a citrus fragrance very similar to the aroma of the flowers of the orange or lemon. The production of essential oil is attracting most of the modern interest.
- Museum There exists a museum that was built decades ago to preserve the archaeological pieces from the Manteo culture that inhabited the place, centuries ago. The museum is maintained by the community.
- Water and Sanitation. The community lacks a system of sewage and most of its gray waters are disposed in septic tanks. The community has water through tankers and also a system of reservoirs connected to water pumps that give the community water with a minimum pressure.
- Swimming pool. One of the attractions of the community is the sulfur water swimming pool. This swimming pool is open to all the tourists and it offers a public good which, is recognized for its healing and regenerative benefits for the skin. It is also said to help people against stress and bad mood. People obtain mud from the bottom of the swimming pool to prepare face and body masks which, improve skin health and beauty.

## 1.3 Attributes of the Community (IAD)

### 1.3.1 Human Infrastructure

Regarding education, 68% of the population has primary education, 18% secondary education, and the big majority of young generations do not consider going to college as an option, as they indicate, life is very expensive outside the community. The younger ones have managed to advance a little more in their education and finish high school.

In most of the homes of the commune there are 4 to 6 people. The majority of housing is constituted by spouses and children, there are no cases of divorce. In several circumstances, married couples stay with their own relatives, especially the family of the groom. 72% of the inhabitants of the Comuna live in houses of mixed structure, brick and wood. Only a 14% of the people in Agua Blanca live in houses made out of cement or bricks due to the higher cost in construction.

Regarding income, 39% of heads of families receives a salary between 150 and 250 dollars per month. 17% obtains a salary between 50 and 150 dollars per month and only 9% reaches more than 350 dollars per month. On the other hand, there is a 17% that receives direct money assistance that is delivered by the government. This means that the majority of the Comuna de Agua Blanca has a monthly income lower than the minimum monthly wage of \$ 354 dollars in Ecuador, for year 2015.

Most home dwellings do not have sanitation services, such as, sewage and potable water, nor telephones. The only generalized service is electrical energy. Cable television or cell phones represent a considerable expense and most of them have both mobile phones and cable television ( 6 to 50 dollars per month).

The majority of the families of the commune have public medical assistance corresponding to the health system of the Social Security (59%). The remaining 41% do not have direct medical assistance but, in case of illness or emergency, they can always go to public hospitals.

82% of the members of the community participate in some activity related to tourism. There is an 18% that does not participate in tourism activities since they are dedicated to activities such as: collector of tagua, barbasco, palo santo, animal husbandry and sale of food. Although most of the community members participate in the tourism activity, it does not contribute enough to cover their needs, so they are obliged to complement the tourist activity in its great majority with the raising of animals, including, goats, pigs, chickens and cattle.

### 1.3.2 Social Infrastructure

The community of Agua Blanca has a historical bond within their families. They are direct descendants of Manteña culture, based along the coastal side of Ecuador during the 1150 to 410 B.P. [3]. Even the physical aspect of the inhabitants of Agua Blanca resemble each other. There exist a strong tie and sense of community which, is the mechanism the community has towards use of resources to make a possible living. There exist hierarchies but they are unclear. There is a centralized organization managed by a president of the

community and a board for monitoring, taxes and other purposes. However, trust has been compromised during the last decades due to the economic hardship and needs for income generation.

One of the critical aspects to understand the institutional arrangement of Agua Blanca is the productive scheme of the community. The importance relies on the fact that economic activities that delivered services with a monetary reward shape the modern relationships in the community that devotes his time and reputation to offer tourism services. The definition of eco-tourism is very broad and in this description we will use the broad term tourism services in the broadest sense. From the institutional perspective, the case of Agua Blanca is enriching because the community makes use of its natural infrastructure, the land, the forest, to extract units that are used for services (tourism) and manufacturing (tree units, lumber). These two activities will be described in the next section to identify the rules in use under the institutional analysis framework.

## **1.4 Rules in Use (IAD)**

Rules in use refer to soft human-made infrastructure established by the community in a form of rules and norms. They govern the human interactions that are not tangible. Most of the rules agreed upon consensus in the community and most of the times, non-written norms shape the actions, interactions and outcomes of the community. The seven types of rules to be considered are:

### **1.4.1 Position Rules:**

Position rules are determined by the community in the form of authorities and rest of members. Authorities comprise president of the community, treasurer and secretary. There is also a very important distinction for positions, tied to the division of labor in the community. Every member, without any exception, is part of the community and therefore, has assigned responsibilities. There are positions in the community which allow control over the flows of tourists, assignment of tourists, and fee charges. However, there might be an over provision of rules that might discourage incentives for the villagers. By this, we mean rules that might trigger discontent because they are perceived as unfair since some policies tend to benefit some members more than others and most important, the assigned task is given by the community in a rotating manner through the year, except for tourist guides.

### **1.4.2 Boundary Rules**

Agua Blanca has a set of boundary rules about who is a member in the community and these rules are established collectively. Villagers extract information and experiences from the forest, in the form of tourist services for people outside of the community who want to experience the forest and the cultural experience of living in the community. Tourists need to pay an entrance fee to the community area and then, they go through a centralized system that assigns a tour guide from the community. There are not free walks, or unsupervised trekking in Agua Blanca. To be a member of the community, those born in it can make the decision at age 15 and send an application to the Assembly for consideration, if they are accepted, they become members and must contribute with a monthly contribution of 1.25 men and 0.75 women. These values are entered into the communal management fund.

### 1.4.3 Choice Rules

The community also has rules to assign responsibilities and activities for every adult member in the community, as it was mentioned above. Also, there exist an internal system for conflict resolution led by the president of the community. The division of labor and the relatively small size of the community ease the control and monitoring of rules. The hard human made infrastructure, a unique entrance with a unique road, helps avoiding the entrance or exit of tourists in a disorder manner. In this case, the key aspect of the rules is the centralized choice rule that the community has to assign productive tasks. This rule is not commonly well received and to decrease the levels of conflict, members make this assignment in a rotating manner so then, every member might be able to benefit of some positions that are more profitable and attractive than others. For instance, every member in the community wants to serve as tourist guide since it is the highest paid activity. It also provides good reputation in the community since, young people who get most of this positions are able to elevate their social acceptance because it is an activity that entails contact with tourists and most of the time, foreigners.

### 1.4.4 Aggregation Rules

Aggregation rules are very important in Agua Blanca, a community that historically has been characterized by central decision making. The aggregation rule is conducted by all adult members of the community, following a rule of the majority. The community has its own statute and hierarchical order established and approved by the Council of the Nationalities of Ecuador in 2010. It is composed as follows: the Assembly of Community, a sort of board of directors, is the highest authority within the community, the Governing Council of 7 people that is chaired by the President of the Council and is the one that takes the actions in the territory and is in charge of 10 committees. The Committees include archaeology, agriculture, parental, artisans, accommodation, festivities, water board, tax collection, tourism, mortuary.

### 1.4.5 Scope rules

Upon entering the Agua Blanca Community, 5 dollars per person is charged. For the *comuneros*, the charge is not for entering but for the service that tourists receive. Those responsible for the collection are the *comuneros* who work in the control of income, they work only for 10 days and they rotate. After 10 days, they must report to the treasurer the income obtained by tourists, this is supported by the number of tickets used. Of the 5 dollars collected, 4 are destined for the payment of the 25 guides and 1 to the community. The distribution of that dollar destined to the community is as follows:

- \$ 0.10 training
- \$ 0.32 maintenance
- \$ 0.08 advertising
- \$ 0.10 cultural events
- \$ 0.10 new projects (mobilization, labor)
- \$ 0.10 communal management (mobilization, travel expenses)
- \$ 0.20 guards, cleaning and maintenance of the lagoon

### 1.4.6 Information Rules

Information rules include the report to all the community members that meet in a general meeting every year. The assembly, the committees and the governing council are accountable to the community.

### 1.4.7 Payoff Rules

Payoff rules are represented by the payments obtained from the services of tourism offered by the community and from the sale of good and merchandise manufactured by the community.

## 1.5 Summary

Agua Blanca Community is a community located in the province of Manab, Ecuador. It has dedicated its activities to agriculture and livestock, especially extraction of products that can be obtained from the cloudy dry forest. Recently, its members offer tourism services as an alternative for community development. This study case focuses on institutional performance of the Community Agua Blanca. This present work uses the comparative analyses regarding Ostrom's Design Principles to analyze the institution framework. The key resource relevant to the commons dilemma faced by the community is the natural infrastructure, punctually the dry forest and also, land under property of the community. Community Agua Blanca represents, in some sense, a case of institutional failure, under the conditions and perspectives of development and generation of income.

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