



Migration and the environment

A pertinent reflection

MIGRATION POLICY BRIEF

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Observatorio Migrantes del Caribe

MIGRATION AND THE ENVIRONMENT. A PERTINENT REFLECTION

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Prologue

Several years ago the European Union supported an important international project which focused on environmental change and forced migration scenarios (EACH FOR). The organization responsible for the Hispaniola case was the Centre on Migration, Citizenship and Development at the University of Bielefeld. The impacts of environmental change on flows of internal and international migration in Hispaniola were analyzed based on research conducted in selected regions of both countries. One of the conclusions of Alscher, the principal researcher, was the need to go deeper into these issues in order to produce more knowledge. Responding to this challenge, in 2010 OBMICA hosted a research associate, Dr Tim Brothers, a geographer from the University of Indiana, who began ground-breaking work around the borderlands of Nalga de Maco National Park. Inspired by this scientific collaboration, OBMICA, along with other local and international partners on both sides of the island, undertook a project that aims to build on these important studies.

It is imperative for the project to improve the capacity to manage the natural resources enjoyed by the communities bordering the National Parks: Pic Macaya in Haiti and Nalga de Maco in the Dominican Republic, so that this management can be transformed into a sustainable source of income for communities.

Thus the following text that OBMICA and CIES—UNIBE present to readers reflects on the results of a project supported by the European Union in Hispaniola (2011—2013) which aims to contribute to the body of literature on these topics. It is a collective effort between two international Italian cooperation organizations and three local partners, and it includes:

- The development of community-based field research in order to understand the issues raised.
- The creation of training activities that enable the development of local capacities.
- The promotion of pilot initiatives—generated by communities through their organizations—at the local level, for environmental sustainability.
- The production of scientific material.
- Activities related to environmental education.

In the case of the Dominican Republic, two publications describe respectively the experience of small-scale pilot field projects and desirable environmental practices in the context under study. Moreover, the content in this *Migration Policy Brief* is further documented in a book entitled *Migration and Environmental Sustainability in Hispaniola* with cartographic documentation (on CD). This publication, *Migration and the Environment: A Relevant Reflection*, is number four in a series of Migration Policy Briefs prepared by OBMICA and CIES - UNIBE.

Executive Summary

The *Nalga de Maco National Park* (NMNP), one of the protected areas that make up the National System of Protected Areas (SINAP for its initials in Spanish), was created in 1995, and it has been listed under the national park management category since 2002, the year when SINAP was created. This park preserves the source of major bi-national rivers of the Dominican Republic and Haiti. Also, it contains important geological and flora formations, such as the dwarf forest.

One of the main criteria that justify its designation as a protected area is the river basin, since it protects the upper watershed of probably the most important bi-national river (*Artibonite*), as well as that of one of the largest rivers of the Dominican Republic (*Yaque del Norte*).

The types of landscape that can be identified in the area surrounding *Nalga de Maco National Park* are natural and cultural, where cultural landscapes with rural features are predominant. The closest urban landscapes are from the towns located at the park's borderlines. These cultural landscapes coexist with a series of natural spaces that represent four life zones that were identified by Tasaico (1967), which are: Lower Very Humid Montane Forest, Lower Humid Montane Forest, Subtropical Humid Forest and Subtropical Rainforest. Broadleaf forest formations and pine forests comprise 41.2 % of the area of PNNM.

The agricultural systems in the area can be characterized as commercial agriculture and subsistence agriculture. Commercial agriculture relies on the farming of short cycle products for markets such as: beans, maize, pigeon peas and squash. Subsistence agriculture involves crops such as yucca, plantains, and bluggoe bananas among others. The cultivated area is represented by the zone's potential for the coffee industry, a crop that is associated with a type of forest cover conservation.

These communities originated with the migration processes that took place since the early twentieth century to "colonize" the Dominican- Haitian border, as well as with the subsequent establishment of agricultural colonies to stimulate the development of the Dominican Republic.

Long-standing human presence in the area, along with the development of agricultural practices, has led to high levels of environmental degradation in the area surrounding *Nalga de Maco National Park*. The condition in which it appears corresponds to an environment where natural resources are being depleted as a result of human activities.

The vegetation cover¹ in the area has undergone changes, and it is worth highlighting particularly the changes in the terrain from forested land cover to agricultural uses. This would correspond with the expansion of the agricultural border, with the aggravating factor that instead of mixed systems that preserve certain tree species, a mixed agriculture with the predominance of short-cycle products is being implemented. These changes have an impact on forest loss, which means a significant decrease in biodiversity.

The depletion of the cover is more prevalent in hillside areas because the processes of soil erosion occur with greater intensity as a result of run-offs. The lifetime of the hillsides for agricultural production is greatly reduced due to erosion, as well as by the lack of good practices for soil conservation, such as terraces.

There is also the problem of pollution; especially the kind caused by the use of chemicals to increase production yields. The problem that arises from the use of agrochemicals relates to contamination, because not only are those chemicals incorporated into the soil, but they pass onto the waters percolating through the soil and reaching the aquifer.

¹ For an illustration of the vegetation cover, see Appendix 2, Map of vegetation cover in Nalga de Maco National Park Area..

The communities surrounding NMNP began with migration processes related to the expansion of the Dominican agricultural border, as well as the increase of Dominican presence on the Dominican-Haitian border. The communities of Río Limpio and Guayajayuco were founded by the ceding of plots and livestock to farmers from villages in the Southwest and Northwest of the Dominican Republic. The community of El Naranjito was founded due to the forced relocation of the populations in the southern watershed of the Central Mountain range (Cordillera Central) Migration patterns in the area have evolved over time.

- **Until the 1970s**, an influx of migrants caused by the consolidation of the agricultural colonies, which were managed by the Dominican Agrarian Institute.
- Since the 1980s, the area has expelled migrants to larger cities in the North: Santiago, Dajabón and Mao.
- **Since the 2000s**, a rural-rural current, relocating people from communities in the mountains to the centers of Río Limpio and Guayajayuco. This population has moved looking for basic services (education, health, drinking water), which they lacked in their home communities. Other movements towards Río Limpio are also explained by the tightening of restrictions on working the land on higher slopes, and thus the abandonment of their land.
- **Since the 2000s**, with the improvement of living conditions in the communities of Río Limpio and Guayajayuco, some interviewees point to a return migration of residents who had left during the 1980s and 1990s for the urban centers of the Cibao and Santo Domingo.
- **A transnational current**, fostered by a demand for agricultural labor force has moved people from Haiti to the Dominican Republic. In many cases, land is ceded through a share-cropping system.

The main cause for migration is the predominant economic situation faced by communities on both sides of the border. In addition, environmental policies and the designation of the zone as a protected area have played an important role since many would argue that such a designation complicates job options as it sets restrictions on agricultural activities - a principal source of work.

One element worth noting is that many Haitian immigrants move to the Dominican Republic during

farming seasons, but return to Haiti afterwards. Although this type of migration is connected to other factors such as the regulation of the border-crossing flow and threats of deportation. Some migrants move through an area that crosses the Central Mountain Range to provide a labor force for the different agricultural communities across the region.

Migration, in this context of environmental degradation and changes in arranging rural spaces in the surrounding communities of Nalga de Maco National Park, can be seen as a series of strategies by individuals or entire families to address their needs for survival in these communities, which then prompts their displacement. On the other hand, this type of migration responds to the need to incorporate the labor force into production processes relating to agricultural development.

Generally speaking, it can be said that the reason for spatial arrangements in the surrounding area of Nalga de Maco National Park is agriculture. The development of agriculture represented a first step toward the organization of space in what is known today as a protected area. This development raised the need for clearing the forest and establishing the plowing of suitable and unsuitable land for cultivation.

One form of spatial organization for agricultural processes is in function of the relief, particularly the height and slope, where flatter and agrarian reform areas may be used for herding or for a type of agriculture supported by irrigation; while areas in valley and mountain for farming short-cycle products. Coffee crops are located in forest areas with one important aggravating factor—in the face of price depression, these areas begin to be used for the cultivation of short-cycle products.

The need to preserve the environment in the zone should be reconciled with methods that enable sustainability and improvement in the quality of life for the surrounding communities. For these purposes, it is necessary to understand the interaction between agricultural practices and environmental policies, since the way in which they intertwine helps understand the dynamics of how progressive degradation occurs in the zone.

The combination of environmental policies which are not implemented and traditional agricultural practices has set the pace for the continuous deterioration of the natural resources in this area under study. Its preservation and, beyond that, its recovery is possible when policies are applied

without discretionary powers and they can be framed within a scheme that recognizes that the way to cultivate the land in these communities must be compatible with objectives to improve environmental conditions.

The need for the drawing up of public policies that contribute to environmental sustainability is a conclusion from knowledge gained from field work and data analysis. The importance of this knowledge lies in the fact that it is the result of first-hand observations made in the field, and thus offers the possibility to connect this learning to public policy as outlined in the Management Plan for the Nalga de Maco National Park. The observations that have come from the communities allow for the integration of local perspectives and the lived experiences of those involved in the management of natural resources. Paying attention to this issue is the foundation for achieving environmental sustainability.

Development activities must be understood as plans that seek to be incorporated into a logical rearrangement of the countryside, beginning with the protected area, which exists in legal and administrative terms through its purchase within legal frameworks. A growing problem with such activities is that they do not consider that, as projects of spatial rearrangement, they must count on the knowledge and cooperation of the communities.

Among the proposals to promote a type of development in the area that may lead to the protection of the environment, the following can be highlighted:

- **The development of programs** and research projects from universities and research institutions to gain better knowledge of the area.
- **Increasing research** regarding local knowledge, the changes that have occurred in the way in which agricultural producers have associated with their environment without causing degradation processes.
- **Management plans** should be based on larger studies that can better categorize the natural resources under protection.
- **Understanding environmental conflict** as a permanent element in the sustainability of protected areas, and not as a temporary aspect in the creation and management of said areas.
- **Analysis of the impact** of the relocation of the population has had in host communities due to the demands in the delivery of public services.

- **An assessment** of the way in which plans to regularize migrant labor would impact the zone, since these are being created from the perspective of businesses' demand for migrant workers, without incorporating into this scheme seasonal or migrant workers who work for small-scale farmers.
- **Educational programs** should be made available not only to community members of Dominican origin, but also to those of Haitian origin, and that the latter have the opportunity of receiving information in their native language, taking into account their level of literacy, so that materials and programs are accessible according to their level of understanding.
- **Development of environmental conservation activities** in the areas of origin of migrant populations would facilitate a priori knowledge of regulations, methods of cultivation, and restrictions characteristic of protected areas that would improve the way in which the migrants carry out their activities as farm workers or sharecroppers in the Dominican Republic.
- **Diversification of production activities** to reduce farmers' dependence on short-cycle crops, which cause the most damage to ecosystems. This diversification would have to consider possibilities to generate revenues in the short, medium and long term.
- **Linking up with landowners** in the area of Nalga de Maco National Park so that they are responsible for invigilating conservation.
- **Identification of agricultural plots** and monitoring that the products come from areas where planting is permitted would help reduce inappropriate and incompatible uses around and about the Nalga de Maco National Park.
- **Public policies** should be based on the need to differentiate development projects based on the specificities of the communities, as well as to allow territorial coordination as an axis of the protected area.
- **The promotion of territorial coordination** by habilitating corridors for human mobility would facilitate monitoring tasks, although it should also be taken into account that the Dominican experience tends to translate better access into the incidence of illegal activities such as the cutting of precious woods and intensified shifting cultivation.

- **Integration of the communities** would need an exhaustive recognition of the actors who are present in the communities.
- **In the face of demographic changes**, integrate young people in the proposals and projects as more than family beneficiaries, and consider necessary the participation of those who are still unmarried or living at their parents' home.



1. Nalga de Maco peak, seen from Río Limpio.
2. Partial view of houses.
3. Slopes habitated for cultivation and herding.
4. Refuge on a plot used for corn production.
5. Administrator of Nalga de Maco National Park addresses a group of people on a visit to La Tayota after the felling of trees where the River Vallecito rises.

- **The importance of projects' contextualization** in local conditions, knowledge and narratives.
- **Considering projects' role** in promoting the empowerment of women, and not just as an extension of their domestic role.



Introduction

The present document explores how migration and environmental degradation encourages a type of reflection where they can be understood as a cause or a consequence of one another. It originates from an exploration of Nalga de Maco National Park, in the Dominican Republic, as the field of study in which various quantitative and qualitative methodologies have been applied as a way to understand how environmental degradation occurs in a protected area; it also verifies the impact migration has in that process.

The area's characteristics are presented first, both from the physical-natural and human points of view. This regional approach alludes to the fact that it is not possible to understand a geographic phenomenon without knowing both the space in which it happens as well as the living conditions of its people.

This is followed by a look at the way in which the process of environmental degradation can be verified, by establishing some of the factors that cause it, as well as the impact on the livelihoods of the population. There follows a look at the way in which migration is represented, its causes, as well as the way in which the figure of the immigrant is constructed in these communities.

The nature of the protected area requires examining how agricultural practices and environmental policies relate to each other in a context in which the expansion of environmental degradation must be stopped and conservation promoted thereby ensuring the subsequent recovery of natural resources.

Finally, the document outlines how public policies should be focused on the following areas: environment and management; migration; livelihoods and communities and development, starting from the experience acquired in the communities of the implementation of diverse projects and programs that have tried to address poverty in the area.



6. Partial view of Río Limpio from Nalga de Maco National Park.

7. Corn planting.

8. Agricultural land after the preparation of the land by "slash and burn".

1. Nalga de Maco National Park and its Surroundings: Landscapes and Migration

Protected areas in the Dominican Republic face a number of risks and problems. Generally speaking, protected areas are viewed in function of their capacity to maintain the forest and improve the living conditions of the population. One perspective holds that protected areas are unpopulated regions, with scarce population or inhabited by people who can be inserted in other settings with little difficulty to adapt. But these considerations have little to say about the way in which people live at the heart of these protected zones or its surrounding areas.

The *Nalga de Maco National Park* (NMNP), one of the protected areas that make up the National System of Protected Areas (SINAP for its initials in Spanish), was created in 1995, and it has been listed under the national park management category since 2002, the year when SINAP was created. This park preserves the source of major bi-national rivers of the Dominican Republic and Haiti. Also, it contains important geological and flora formations, such as the dwarf forest.

One of the main criteria that justifies the zone's designation as a protected area is the river basin, since it protects the upper watershed of probably the most important bi-national river (Artibonite) and one of the largest rivers of the Dominican Republic (*Yaque del Norte*).

Nalga de Maco National Park is located in the western part of the Central Mountain Range (Cordillera Central), spreading across both slopes of it. The Central Mountain Range extends to Haiti as the *Massif du Nord* and the park's proximity to the Dominican-Haitian border allows it to be designated as a protected border area.

The NMNP covers an area of 169.85 km², as indicated in its Management Plan, and its surroundings include a number of communities where diverse landscapes that expose different relationships to the protected area can be observed. The communities that serve as sub-hubs, polarizing the spaces inside the NMNP are: Río Limpio, Guayajayuco and Villa Los Almacigos. These are considered as sub-nuclei because they polarize rural communities within the periphery and inside the park. These sub-hub communities reveal a break in the alleged continuity of the protected area: their territories

belong to different provinces, they show diversity in their ecosystems, and the level of their relationship with nature is different –while some appreciate the need for preservation; in others, the expansion of the agricultural border is progressive. Then there are the conservation images ranging from populations that exemplify spaces environmentally preserved, some areas less visible that are not preserved, or where access can be gained to plow new land.

The types of landscape that can be identified in the area surrounding *Nalga de Maco National Park* are natural and cultural, where cultural landscapes with rural features are predominant. The closest urban landscapes are from the towns located on the park's borderlines. These cultural landscapes coexist with a series of natural spaces that represent four life zones as identified by Tasaico (1967). These are: Lower Very Humid Montane Forest, Lower Humid Montane Forest, Subtropical Humid Forest and Subtropical Rainforest. Broadleaf forest formations and pine forests comprise 41.2 % of the area of PNNM.

The agricultural systems in the area can be characterized as commercial agriculture and subsistence agriculture. Commercial agriculture relies on the farming of short cycle products for markets such as: beans, maize, pigeon peas and squash. Subsistence agriculture involves crops such as yucca, and plantains, and bluggoe bananas among others. The cultivated area is represented by the zone's potential for the coffee industry, a crop that is associated with a type of forest cover conservation.

These communities began with the migration processes that occurred since the early twentieth century to 'colonize' the Dominican- Haitian border, as well as with the subsequent establishment of agricultural colonies to stimulate the development of the Dominican Republic.

The migration phenomenon is related not only to the founding of communities, but people living in the area move and migrate to other rural areas for production and/or commercial activities, and to urban areas of higher standing (Loma de Cabrera , Dajabón, Santiago and Santo Domingo). International migration is one of the forms of migration in the area, linked to agricultural processes and the demand for labor force for the harvest; although recently sharecropping appears to be a pull factor for Haitian nationals in the area.

Cooperation for the development of the area has focused on the community of Río Limpio, with certain interventions in other communities (Guayajayuco). Cooperation projects have focused on promo-

ting alternative activities of production (ecotourism, handicrafts); changes in agricultural practices (controlled agriculture, irrigation systems, planting of horticultural products for the market); supporting local production (donation of plants, loans for the improvement of coffee plantations, technical assistance); institutional strengthening (support for farmers cooperatives); expanding access to basic services (water supply, sewage management) and road construction. But, despite all these efforts, poverty persists in the communities.

2. Environmental Degradation and Migration

Long-standing human presence in the area, along with the development of agricultural practices has led to high levels of environmental degradation in the surrounding area of *Nalga de Maco National Park*. The condition it shows corresponds to an environment where natural resources are being depleted as a result of human activities.

The vegetation cover² in the zone has undergone changes, and it is worth highlighting in particular the functional changes of the land from forested land cover to agricultural uses. This would correspond with the agricultural expansion of the border, with the aggravating factor that instead of mixed systems that preserve certain tree species, a mixed agriculture with the predominance of short-cycle crops is being implemented. These changes have an impact on forest loss, which means a significant decrease in biodiversity.

The consequent reduction of forest cover threatens the already scarce primary forests and the emergence of a secondary forest as a result of either the respite given to some plots or the ending of farming activities. The forest also appears in the area as a result of the promotion of forest systems, or of those mixed ones that include in their typology species of forest value.

With the introduction of a type of forest as a forest alternative, one can assert that the area becomes a change for good beyond its importance as an ecosystem, losing in the process, cultural values that the forest has offered its communities. The forest is posited by state policies as of value for one type of species—*Pinus sp.*—for its timber potential, against other species that do not have such potential. Thus, the forest cover that is linked to this model does not correspond with the original species in the area, nor is it related to the associations made between species on the basis of the cultivation of crops that require shade, such as coffee.

The depletion of the cover is more prevalent in hillside areas because processes of soil erosion occur with greater intensity as a result of run-offs. The lifetime of the hillsides for agricultural production is greatly reduced due to erosion, as well as by the lack of good practices for soil conservation, such as terraces.

The situation of the hillsides entails a greater drama since the difficulty in its handling or adaptation to its steep slope and accessibility, makes it harder to implement conservation practices. The use of fire utilized in slash-and-burn agriculture is much more difficult to control. Equally difficult to implement is the planting of trees due to the loss of nutrients which hinders recovery.

Those interviewed have reported a decrease in the water levels, linking it to deforestation in the upper watersheds of rivers and streams, as well as the loss of riparian forests. The race to more productive lands has led to the felling of forest patches on the banks of the runoffs, areas that were traditionally preserved by farmers.

Water shortage and the aggressiveness of the floods as a result of felling are consistently brought up. Even areas that are considered to have been highly involved in awareness-raising campaigns, such as Río Limpio, have shown land clearances near water sources of the local aqueduct, which is a cause for alarm among these communities, jeopardizing access to water for a growing population that already faces problems in providing drinking water for the entire community.

There is also the problem of pollution; especially the kind caused by the use of chemicals for increasing production yields. Fertilizers are used to improve soil fertility; however, producers say that the cost of fertilizers severely limits their use. The use of herbicide is frequent, not only for weed control, but it is equally used in cultural practices such as soil preparation to replace burning or 'slashing'. Pesticides are applied to control certain pests, especially in coffee plantations.

The problem that arises from the use of agrochemicals relates to pollution, because not only are those chemicals incorporated into the soil, but they pass onto the waters percolating through the soil and reaching the aquifer. The disposal of the containers presents yet another problem, since they are often used at home and because of their imprecise final destination at improvised dumping sites around properties. Community exposure to polluted waters, as well as to the containers, has led to health problems, especially gastrointestinal illnesses.

² See Appendix 1, Location of Nalga de Maco National Park Area.

It can be said that in these communities, environmental degradation is a structural problem, and it is linked specifically to unsustainable agricultural activities aimed at market production. In this territorial context, one can trace migration processes in these communities, which can be summarized as originating from two fundamental processes:

- The restructuring of rural space in the Dominican Republic. It happens with the promotion of a model of agricultural colonies that had as its final objective to “populate” the area on the Dominican-Haitian border, as well as to increase the production of crops, aimed at the market.
- The international migration of Haitians to the Dominican Republic as the labor force to an economic sector that faces the problem of an aging workforce, and also as human capital which allows for the expansion of farming areas, compensating the reduction of production with an intensification of labor together with a wider agricultural border.

The communities surrounding NMNP began with migration processes related to the expansion of the Dominican agricultural border, as well as the increase of Dominican presence on the Dominican-Haitian border. The communities of Río Limpio and Guayajayuco were founded by the ceding of plots and livestock to farmers from villages in the Southwest and Northwest of the Dominican Republic. The community of El Naranjito was founded due to the forced relocation of the populations in the southern watershed of the Central Mountain range (Cordillera Central) Migration patterns in the area have evolved over time.

The founding arrangements of these communities linked to recent migratory processes to which the first families can be linked, the first “Dominicans” born in the communities, the “older” people constitute important milestones to trace community connection to migration. Uprooting is a constant, and the difficulty of generating an endogenous development process, from the communities themselves, affects the growing depopulation that has resulted from converting the territory of the communities into a national park.

Migration patterns in the area have evolved over time:

- **Until the 1970s**, an influx of migrants because of the consolidation of the agricultural colonies, which were managed by the Dominican Agrarian Institute.
- **Since the 1980s**, the area has expelled migrants to larger cities in the North: Santiago, Dajabón and Mao.

- **Since the 2000s**, a rural-rural current, relocating people from communities in the mountains to the centers of Río Limpio and Guayajayuco. This population has moved looking for basic services (education, health, drinking water), which they lacked in their home communities. Other movements towards Río Limpio are also explained by the tightening of restrictions of work in mountainous areas, as well as the abandonment of the land.
- **Since the 2000s**, with the improvement of living conditions in the communities of Río Limpio and Guayajayuco, some interviewees point to a return migration of residents who had left during the 1980s and 1990s for the urban centers of the Cibao and Santo Domingo.
- **A transnational current**, fostered by a demand for agricultural labor force has moved people from Haiti to the Dominican Republic. In many cases, land is ceded through a share-cropping system.

A single characterization of migration in that zone could be reductive of the realities lived by these communities. But an analysis of the aforementioned migration processes enables identification of the following types of migration:

- **Rural-rural Migration.** This produced by displacement from one rural community to another with better access to services; it is also due to forced displacements caused by the implementation of the Law that converts the zone into a national park.
- **Rural-urban Migration.** This is the migration towards main urban centers, mainly motivated by the lack of job opportunities. The main migrants are young people.
- **Transnational Migration.** Transnational immigrants are mainly of Haitian origin, who move to the Dominican Republic in search of jobs, fundamentally agriculture workers.
- **Pendular Migration.** This is from the villages in the flatlands to higher lands to work in agriculture. This type of migration includes people who have been displaced from their plots in the upper northwest slope towards Río Limpio, but have sought new farmland on the southern slopes.

The main cause for migration is the predominant economic situation in the communities on both sides of the border. In addition, environmental policies and

the creation of the protected area have played an important role since many argue that it complicates job options by restricting agricultural activity - the principal source of work.

Migrants differ on the basis of their ethnicity. Among people of Dominican origin, migration of single young men and women is predominant; while among people of Haitian origin, migration of single males predominates, although recently, some Haitian immigrants are moving with the whole family.

One element worth noting is that many Haitian immigrants move to the Dominican Republic during farming seasons, but return to Haiti afterwards, though this type of migration is connected to other factors such as the regulation of the border-crossing flow and threats of deportation. Some migrants move through an area that crosses the Central Mountain Range to provide labor force to the different agricultural communities across the region.

Haitian migrants work mainly in agriculture, although some engage in border trade at the market in Tiorí. One aspect that interviewees of Dominican origin point out is that Haitians (men and women) trade with minor crops in the community and at border markets.

In general, one can talk about positive and negative impacts of migration:

- **On the positive side of migration**, for instance, providing a work force for a segment of aging farmers, whose descendants are moving into other economic sectors (secondary or tertiary) or migrate to other regions. There is also less pressure on natural resources in areas that remain uninhabited.
- **Among the negative aspects**, one can speak of the depopulation of the zone, with the consequent cultural and social losses. Then, there is also the depiction of the international migrant as the scapegoat for committing environmental crimes, as well as the persistence of farming on deteriorated lands, whose impacts may be irreversible for the recovery of ecosystems.

Migration, in this context of environmental deterioration and changes in arranging rural spaces in the surrounding communities of Nalga de Maco National Park, can be seen as a series of strategies by individuals or entire families to address their needs for survival in these communities, which then prompts their displacement. On the other hand, this type of migration responds to the need to incorporate a labor force into the production processes relating to agricultural development.

Firstly, field data reveals that environmental degradation has not been caused by transnational migrants, but instead, as we have seen, it is connected to agricultural practices. But there are comments from some of those interviewed that tend to consider migrants as predators of the environment. This conception relates to notions about the environmental condition of the part of the island occupied by Haiti, noting that part of the idiosyncrasy of Haitian nationals is depredation.

Such value judgments on transnational migrants do not consider their inclusion into the labor market, in which they are hired by Dominican farmers to carry out certain cultural practices that threaten environmental sustainability. Furthermore, it does not consider the production dynamic developed through share-cropping schemes, in which the sharecroppers tend to intensify work to increase profits; highlighting the fact that the ceded lands for cultivation are owned by Dominicans.

A point for further analysis should be identified as the need to explore the environmental conditions of the place of origin of migrants. Despite recognizing the deterioration of their environment, it is said that other factors relating to having access to means of production that are more important when it comes to deciding to migrate to the Dominican Republic. The lack of supporting programs for production has an effect on these migrations; also, the urge for cash generated by their labor.

One fact that supports this information is that Haitian migrants make plans to return to their home communities after their work in the Dominican Republic. Another supporting fact is their assertions that these revenues can help them develop income-generating activities in Haiti, or help support their families.

3. Agricultural Practices and Environmental Policies

Generally speaking, it can be said that the reason for spatial organization in the surrounding area of Nalga de Maco National Park is agriculture, since it is part of the narrative that connects the locals, as well as the primary economic activity. The development of agriculture represented a first step toward the organization of space as it related to what is known today as a protected area. This development necessitated the clearing the forest and establishing the plowing of suitable and unsuitable lands for cultivation.

As a prominent element in the configuration of this rural space, there is the pattern of dispersed settlement linked to the relationship between

production and residential spaces. This fact can be seen in many small villages and local communities that can be found in the area; as well as the disappearance of an reminder that certain villages were abandoned because of conditions of limited accessibility and opportunity to obtain land in areas closest to the original settlements.

One form of spatial organization for agricultural processes is in function of the relief, particularly the height and slope, where flatter and agrarian reform areas may be used for herding or for a type of agriculture supported by irrigation; while areas in valley and mountain for farming short-cycle products. Coffee crops are located in forest areas with one important aggravating factor—in the face of price depression, these areas begin to be used for the cultivation of short-cycle products.

Livestock comes into play in the declining production of these agricultural lands and a decrease in the labor force required for starting up production. It also serves as a source of income for families who cannot start a profitable use of their land.

The need to preserve the environment in the zone should be reconciled with methods that enable sustainability and improvement in the quality of life for the surrounding communities. For these purposes, it is necessary to understand the interaction between agricultural practices and environmental policies, since the way in which they intertwine helps to understand the dynamics of how progressive degradation occurs in the zone.

Agricultural practices can be classified according to the level of adaptation to the changes necessary to preserve the environment. Thus, one could mention:

- **Traditional agricultural practices.** These would refer to the development of stockbreeding and shifting agriculture associated to “cash crops” as the cornerstone of these communities’ development.

- **Modified or new agricultural practices.** Understood as the development of farming systems that protect the environment, such as growing in controlled environments, the cultivation of organic cocoa, coffee and rice, systems that include fruit, horticultural and species of forest value.

As for these environmental policies, they are linked to the various actions that are intended to achieve conservation of the environment, and it is not possible to reduce them to biological aspects; instead, they are connected to the management plans for the area. Due to the different institutional problems within the system of protected areas in the Dominican Republic, the way to address environmental policies should be based on their level of compliance, which would result in:

- **Applied Environmental Policies.** The implementation of environmental policies occurs in an environment where plans and projects in the Management Plan have already been identified, without establishing exceptions that would indicate discretionary enforcement of the environmental laws.
- **Environmental policies** without implementation. This refers to maintaining a situation in which laxity prevails in the enforcement of environmental laws, together with the failure to comply with the agreements made with the communities in terms of compensation and relocation on account of the abandonment of agricultural land.

As previously suggested, agricultural practices are the main catalyst for the dynamics that cause environmental degradation in the zone, since their inclination towards the market and the conversion of production to one of greater benefits relates to the abandonment of cultivation for auto-consumption.

In the context of the need for environmental policies, the traumas for these farming communities, caused by the limitations of production spaces, have generated tension, and the main loss has

Table 1. Expressions of Agricultural Practices and Environmental Policies

Agricultural Practices	Environmental Policies
<p>Agricultural practices relate to the way in which the land is cultivated, or methods to cultivate it. Shifting cultivation and livestock are believed to be the human activities that have caused environmental degradation in the area. Other methods are the promotion of agricultural systems that integrate forestry, fruit, and coffee cultivation. In addition, the introduction of technology, as well as production in greenhouses or controlled environments, the development of organic crops such as coffee, cocoa and rice may be viable alternatives.</p>	<p>Environmental policies are the other variable in question, since the protected area and its management are a tangible expression of these policies. In this sense, the following can be mentioned as part of the actions within the policies: the delimitation of the protected area and its subsequent buffer zone, the classification of activities that can be carried out in the different areas, the processes of relocation and compensation, training and prosecution of environmental crimes.</p>

been for the zone's biodiversity. This is a contradiction because instead of implementing the projects in the Management Plan of NMNP in a sustained and inclusive manner, most of them have not been executed yet. And as for the ones that have been initiated, it can be said that it has been in a timid way or they have not included the majority of the affected communities and locals.

The combination of environmental policies with no implementation and traditional agricultural practices has set the pace for the continuous deterioration of the natural resource in this area. Its preservation and, beyond that, its recovery, is possible when policies are applied without discretion and can be part of a scheme that recognizes that the way to cultivate the land in these communities must be compatible with objectives to improve environmental conditions.

4. Public Policies for Environmental Sustainability

The need for the creation of public policies that contribute to environmental sustainability is a conclusion from knowledge gained from field work and data analysis. The importance of this knowledge lies in the fact that it is the result of first-hand observations made in the field, and thus offers the possibility to connect this learning to public policy as outlined in the Management Plan for the Nalga de Maco National Park. The observations that have come from the communities allow for the integration of local perspectives and lived experiences of those involved in the management of natural resources. Paying attention to this issue is the foundation for achieving environmental sustainability.

Developing activities must be understood as plans that seek to be incorporated into a logical rearrangement of the rural spaces, beginning with the protected area, which exists in legal and administrative terms through being registered in legal frameworks. A growing problem with such activities is that they do not consider that, as projects for spatial re-arrangement, they must count on the knowledge and cooperation of the communities.

■ Environment and Management

The creation of the protected area is aimed at preserving natural resources in the vicinity of the *Loma Nalga de Maco* hillside. The main guidelines proposed for developing public policies come from considering: knowledge about the area and the proposed management of the protected area.

The information gleaned during the preliminary studies of the project, "Studies and Pilot Initiatives to Promote Environmental Sustainability in the Dominican Republic and Haiti" (Ref. DCI-ENV/2010/254-095), revealed how despite the ample biological and environmental diversity in the areas studied, there was little in-depth research on the area that provided an account of such characteristics. General characterizations, inventories of flora and fauna, as well as exploratory studies are the norm in the academic knowledge that has been compiled.

In this regard, it is considered relevant to develop programs and research projects from universities and research institutions to increase knowledge of the zone. This would allow advancing beyond a rough and fragmentary knowledge, which ultimately would lead to the implementation of development plans that are sustainable and can enhance the natural resources of the localities.

To approach knowledge from an academic stand, one must consider the importance of integrating community knowledge about their environment. Over time, even with contradictions due to overexploitation, communities have had a long tradition of relationship with the environment that had not led to advanced stages of degradation.

It can be said that changing towards production models related to the market, involves a loss of environmental understanding of the area, exchanging it for economic criteria that define conservation on the basis of maximizing profits.

Another factor relating to the loss of understanding of the environment in these localities, results from migration processes, aging population, changes in production activities, as for example the introduction of a type of "forest" that in many cases does not correspond to the original conditions of the zone, but is planted because of its forestry potential.

Consequently, it is appropriate to propose increased research on local understanding, on the way changes in the way agricultural producers have been relating to the area without causing degradation processes. Also, knowledge of the zone, allows its integration in identifying important habitats and areas that deserve special attention.

The connection between local and academic environmental knowledge should also be located within the proposed management scheme. The Management Plan of Nalga de Maco National Park proposes a co-management model that makes it feasible to introduce the historical relationships that communities have created with their environment.

For that reason it would be feasible, as well as necessary, that management plans be based on studies of greater magnitude that better categorize the natural resources under protection. A better understanding of the characteristics of the protected area would result in a better definition and higher levels of commitment to conservation.

Among the identified problems, there is the creation of the protected area and its subsequent categorization and zoning from essentially conservationist perspectives, without progressively involving the community in the discussion. The sustainability of the NMNP is only possible taking as a starting point local histories and the needs of these communities.

Co-management would reconcile activities developed by the different state agencies and NGOs that are implemented in the surrounding area. Discussing activities through a transversal figure, which could take into account for the diversity of the stakeholders, would in turn facilitate more concerted actions that could have greater impact.

Conflict should be understood as a permanent element in the sustainability of protected areas, not as a circumstantial aspect in their creation and management. Confrontation does not end with the designated zone becoming a category for management, nor with the development of a legal framework, but as an integral part of all the clashes that threaten the livelihoods of those families.

Management should be a clear strategy that starts with spatial organization and unifying the protected area with the communities. For that reason, it is necessary to promote physical demarcation, the clarification of boundaries, the geo-location of the plots to be able to measure more precisely the impacts that occur.

■ Migration

Migration, as a secondary factor, or as an element to articulate a discourse that shifts the responsibility for environmental crimes, needs to be understood within its spatial and temporal sphere. The diversity of migration dynamics indicates the need to think of it beyond displacement, and think of its causes and its consequences.

In the case of the re-concentration of populations, we should analyze the impact they have had on the provision of public services in host areas. Improvisation of new housing units causes outbreaks of environmental pollution in the villages, so the proposed

relocation would need to include monitoring the living conditions of people in the destination sites.

In the case of international migrants, they are represented as “environmental predators”, making no connection between them and the needs for their labor in the production cycles.

Plans to regularize migrant labor are based on businesses’ demand for migrant workers, without incorporating into this scheme seasonal or migrant workers who work for small farmers. This perception requires a more accurate and inclusive understanding of the labor market, so that the problem of this area under study becomes part of the considerations recognized in the provision of documents to migrant workers.

Migrants are only regarded as workforce, in certain aspects interchangeable with each other, which is why plans to mitigate the negative impacts caused by the limiting of production activity in the area should include them as direct beneficiaries of such plans.

Low levels of education, illiteracy and language difficulties often mean that the activities for which immigrants are hired are not developed satisfactorily. For example, lack of understanding of protected areas and restrictions for agricultural work in those areas creates a series of problems for environmental monitoring activities.

Educational programs should be made available not only to community members of Dominican origin, but also to those of Haitian ancestry, and the latter have the opportunity of receiving information in their native language, taking into account their level of literacy, so that materials and programs are accessible to their level of understanding.

Similarly, developing environmental conservation activities in the migrants’ areas of origin would provide them with *a priori* knowledge of regulations, cultivation methods and restrictions pertaining to the protected areas, which would improve the way in which migrants perform their work as migrant agricultural laborers or sharecroppers in the Dominican Republic.

■ Livelihoods

The creation of the protected area proved to be a contradiction to agriculture—the primary livelihood of the communities surrounding Nalga de Maco National Park. This designation called for a reconsideration of production activities, which has not always been fulfilled because of the inherent difficulties in managing the national system of protected areas.

Environmental degradation has been a constant challenge, with a downward spiral in yields of production

units due to erosion and loss of soil fertility. As a result, there have been levels of intensification and expansion of the agricultural border that have not adequately offset the benefits, but instead have had a negative balance in the equation that stabilizes environmental conditions.

Proposals for the area would have to diversify production activities in order to reduce farmers' dependence on short-cycle products, which cause the greatest damage to the ecosystems. This diversification should consider the possibilities of generating income in the short, medium and long term.

One problem that has been observed is the return to "cash crops" because they allow access to more expeditious monetary resources. Consequently, when plans for diversification of economic activities emphasize the medium and long term, they lose sight of the families' everyday needs, which makes them return to a type of shifting agriculture—or renting plots becomes an option for them.

With the risks involved in the promotion of agro-sylviculture systems in the zone, it should be considered how coffee and cocoa, as agroforestry systems, could be more compatible with the objective of environmental conservation. Likewise, the introduction of other types of agricultural practices, such as the ones performed in controlled environments, organic agriculture should have a better connection to the market, contemplating training and support for commercialization and the value added to the products cultivated.

There is a challenge in how agriculture can be reconciled with conservation, for although there are clauses in the legislation, such as the purchase or exchange of land ownership, the rule of thumb is that the owners still think of these spaces as their land. Moreover, the lack of accountability of a particular individual for actions carried out in mountain areas, would mean a major increase in monitoring activities.

One constant is the dispersion / discontinuity of the production units in plots of different sizes and location, where different uses and intensification levels proliferate. This could be a plus factor when diversifying the families' production activities, since reducing them to a single type of activity makes them more vulnerable to price depression of their products, pests and lack of production incentives from the authorities.

Thus, identifying plots and monitoring the products, so that they originate from areas where planting is permitted, could help reduce inappropriate and incompatible uses of the areas in Nalga de Maco National Park.

Similarly, it is necessary to understand that reducing

policies or projects in specific areas entails the risk of excluding people who although they live in one community, have their livelihoods in another. In this regard, it should be noted that some people, when their farming activities were limited in their area, transferred their work to other areas with lower levels of surveillance..

■ Communities and Development

The area surrounding the Nalga de Maco National Park comprises three different areas, which highlight different levels of conservation and action on the part of environmental authorities. Public policies should derive from the need to distinguish development projects according to the specificities of those communities, as well as to allow territorial coordination at the axis which is the protected area.

Consequently, it is crucial to overcome the lack of coordination among these communities caused by relief, historical, political and administrative conditions. Increased coordination, habilitating corridors for easier human mobility, would facilitate monitoring tasks, although it should also be taken into account that the Dominican experience tends to translate better access into the incidence of illegal activities such as the cutting of precious woods and intensified shifting cultivation.

The way in which this coordination would be conducted, would be to promote greater effectiveness in the plans, solutions and implementation of alternatives. The functioning of the area would generate interactions at different levels—provincial, municipal, national and global. When presented like this, it is necessary to add that one mechanism to improve the living conditions involves understanding projects' reliance in having a better connection to other communities beyond the park boundaries.

This is why the narrative of community development should go beyond the conception of space as a container to locate projects; instead, one should consider the historical authenticity posed by reorganizing plans of rural areas, which have set the pace of human impact in the area.

By and large, the notion has been a clear invisibility of these communities because of the a priori conception of the zone of the Nalga de Maco National Park as a natural setting. This leads to promoting a series of policies that do not see beyond the hubs of its settlements, making it difficult to connect with other more isolated areas, over which, however, different levels of influence are exercised.

The integration of these communities would require a thorough appreciation of the actors present in

said communities. In many communities, organizations exist in duplicate and have the same purpose, which evidences individuals' vested interests and the way they organize for the projects carried out. This element would motivate more broader-based actions, trying to integrate in its execution many organizations.

Demographic changes appear as a process that reshapes economic activities and community relations. Young people's migration means that proposals and projects should rethink them as more than family beneficiaries, and consider necessary those who are still unmarried or living at their parent's home.

For these communities, history reveals a variety of development initiatives, in conjunction with persistent impoverished living conditions. In this respect, questions as to the reasons why development projects have not had a long-lasting impact in changing the living conditions are often asked.

One problem arising from development projects has been the creation of "castes" among the people from these communities starting from the beneficiaries who have access to those projects.

This produces an erosion of social capital due to intra-community divisions in terms of who has access to the "benefits" generated from participating in these projects, which focus on family economies and not necessarily on the communities. NGOs are often considered businesses, job generators and substitutes for state action, with very little presence and insignificant impacts.

Equally significant is the need to contextualize projects in local conditions. Up until now, there has been little contextualization of certain projects, since they have not synchronized with local histories of production and farming practices. In this regard, actions should be broader, and should take into account the need to create changes in the cultural practices rife in these communities.

It also becomes crucial to consider gender as a variable that goes beyond integrating women into projects that are extensions of their domestic role, such as cultivating home gardens to feed their families; instead, some activities that may serve to promote greater empowerment in the various facets of community life should be created.



9. Typical cabin in the ecotourism project "Green Center" in Río Limpio.

Conclusions

This document started from considering the connection between migration and the environment as a relevant reflection. The considerations and arguments presented point to the importance that in addressing structural problems such as environmental degradation, it is customary to introduce a variable—like migration—that, although it is secondary, helps to understand the dynamics in which the environment suffers irreparable losses due to human actions.

Public policies tend to be focused on sustaining a form of environmental equilibrium in which communities are integrated into new rural restructuring processes, deriving from or exacerbating environmental conflicts. The starting point of environmental policy should be to recognize the historical authenticity of these communities and how over time they have modified their relationship with the environment, and to try to rescue models of the environmental management that are inclusive of this latter historical authenticity.

To this end migration would appear as linked to production cycles, as well as a response to changes exerted by the promotion of new models of rural development, which require incorporating a labor force.

Although migrants are often understood as victims—of deteriorated environmental conditions in their communities of origin, or as predators—

because they carry out non-sustainable farming practices—they should be removed from this binary construction to a field where they can stand out as key players, incorporated into development plans and thereby enhancing the contributions that they could make to conservation.

One additional point of interest corresponds to integrating sustainable agricultural practices with environmental policies that may be effectively enforced. In this sense, it is worth thinking of the importance of implementing management plans already drawn up, and enforcing restrictions imposed on land uses in certain zones of protected areas.

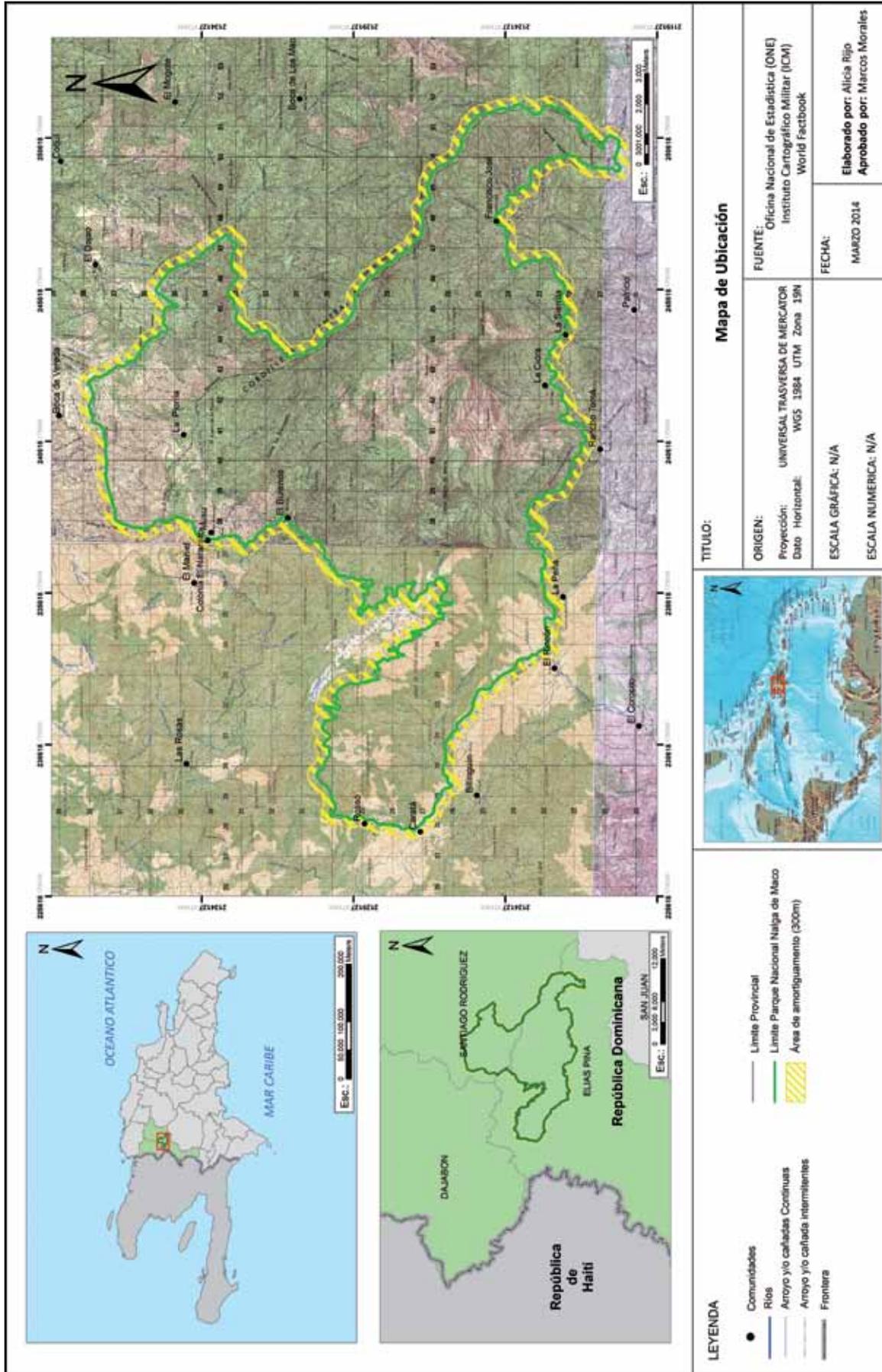
Discretionary power as a permanent factor when enforcing environmental laws, identifying development projects, or selecting beneficiaries, represents a contradiction to the idea of communities' integration into a system of co-management of protected areas and must be taken into account in the decision making process.

Human displacements are a constant feature of human nature; therefore, environmental sustainability should take into account how migrants may be incorporated into public policy—the way they insert themselves into the communities—and from this central idea, promote development actions that take into account territorial interaction at different levels.

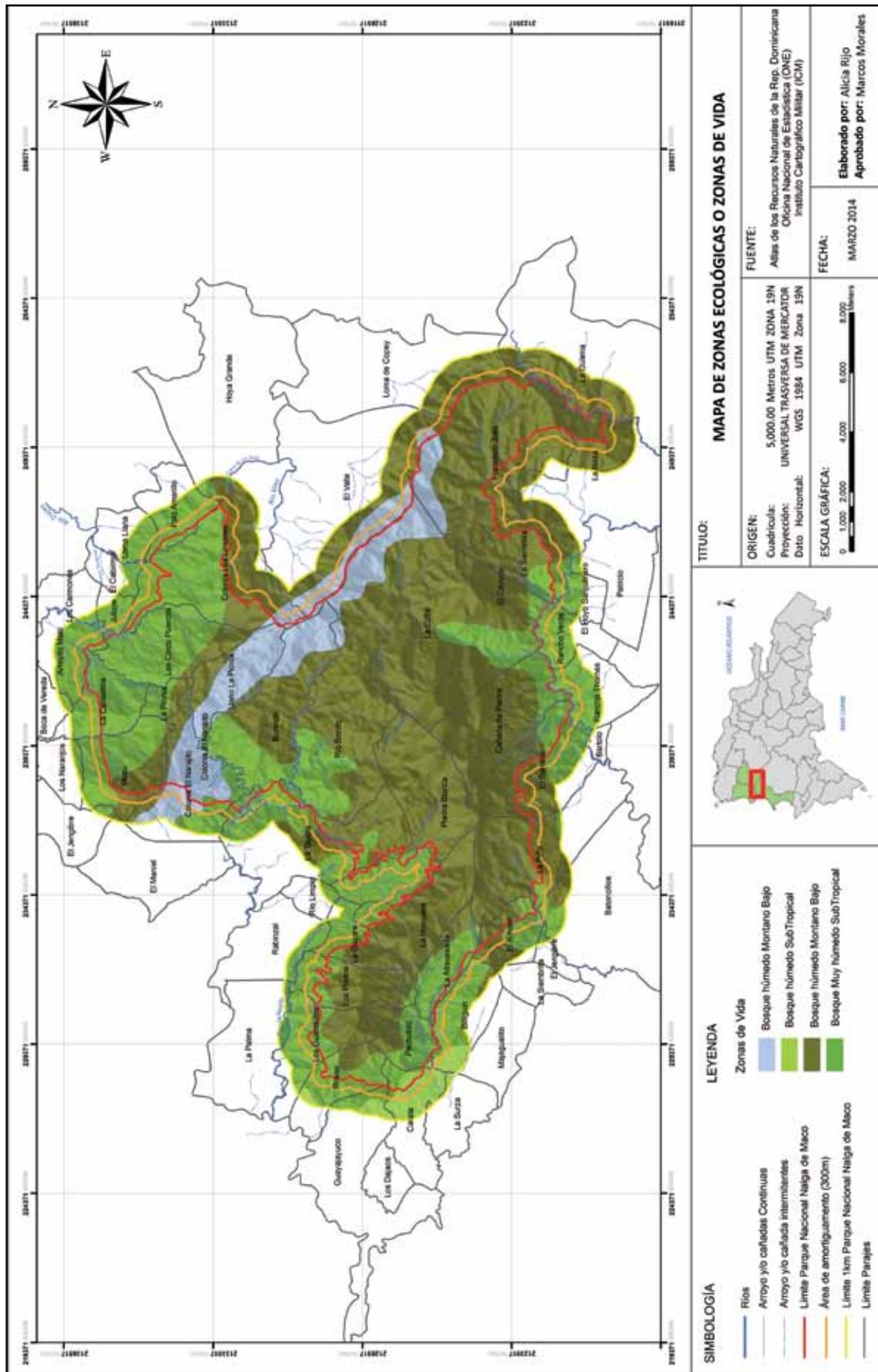
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Anexo 1: Localización del Parque Nacional Nalga de Maco



Anexo 2: Mapa de cobertura vegetal en el área del Parque Nacional Nalga de Maco



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