

# Diffusion of Innovations: reforestation in Haiti



by Raffaella Bellanca  
COMDEV-01

**Yon sèl dwèt pa ka manje kalalou  
(you cannot eat okra with just one finger)**

**to Ayiti Cheri,  
to SousCho,  
to Dharma**

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## Introduction

The first farmer I interviewed in the rural village of SousCho, North West Haiti, had told me all I needed to know. I could have left the country the day after and started writing this thesis. But, of course, back then, I didn't realize that. My first interviewee politely answered a number of probably unintelligible questions for a quarter of an hour or so. I introduced myself in relation to the reforestation program and then I was asking: "do you own a radio?", "do you have relatives abroad?", "where was your wife born?", "do you sell charlottes at the weekly market?". It must have been puzzling to him. A combination of Haitian courtesy and the fact that the visit of a *blan* (white in Creole), this weird and fragile form of life seldom seen in the countryside, is often a source of entertainment, kept him from showing me the door; also because there wasn't really any door, as people in SousCho live prevalently in their yards. The farmer looked somewhat old; I know his age because I asked, but it would have been otherwise impossible to guess. He has a wife, well actually two. His scholastic education consists of a few months of presence in first elementary class, but that was long ago. All his kids (and we are talking a numerous amount) went to school; proudly. The interview rolled pleasantly to the end. I had purposely opted for the in-depth interview style, partially because of its strengths as research tool, and partially because it requires the mastering of something I'm good at: emphatic chatting. As a last question I asked the farmer the reason why he wanted to plant the trees on his land. He hesitated, obviously thinking that I was a bit naïve, then patiently explained that first, trees give fruits, then trees give shadow, and finally, embracing in a gesture of his arm the desertified hills that constitute Haiti's most common landscape, trees are beautiful.

Seeing it from a distance I can now appreciate the poetry of that situation; however, honestly speaking, when the sun went down and all (yes no exception) interviews ended with the same statement "yes please I'd love to have trees to plant on my land", a cloud of discouragement would fall on me. How was I supposed to conduct my research if I could not find one single *laggard*? How could I design the *S-shaped distribution curve of adoption* if everybody wanted to adopt from the very beginning?

This is the charm of science; sometimes the results you get are not nicely painting the reality you had in mind, but indicate a different path. Fine, there wasn't so much else left to do than to follow that path.

How I did end up in Haiti in the first place is another story.

Haiti is a wonderful little country affected by numerous problems one of which is environmental degradation. What was once the richest colony of France, covered by a lush tropical forest, is now the poorest country of the western hemisphere; desertified for the most. The causes of this situation are mixed in an intricate blend of historical events, geopolitical glocal equilibriums and socio-economical factors all interlinked with each other and far too complex to be mastered. In other words, Haiti is a good representation, in small scale, of the problems of the planet. I therefore thought that reasoning about the Haitian situation would be a way to reflect upon the global context.

A background in natural sciences makes me look at problems preferentially from a technical point of view; any innovation that prizes sustainability solicits my curiosity; any unprecedented way of extracting energy from renewable sources inspires me. But on Haiti, as on this planet, technology is not the whole point. Science used at its best provides the instruments to identify problems, and can suggest ways to solve them. Still, human comprehension is limited, so that concurrent explanations exist at the same time; human inventiveness is restless, so that several solutions pointing at opposite directions can arise on the table; finally, human ethical principles and social constructions are to be constantly defined and negotiated, and technology is of no help in that task. In other words, science does not provide solutions, just instruments to enable an informed judgment. Yet it is an important role. To be able to elaborate an informed judgment, one needs to be informed. Communication becomes therefore the key feature of this era of choices in which we are about to decide the future of our species and many others on this planet. Communication for survival then; communication to choose among future scenarios. Communication without preferential directions since all parts have the right and responsibility to contribute; science, or, more in general, relevant information, does not have preferential producers, every actor being entitled and requested to participate in the debate; improvement toward a just society where resources are fairly shared and consumed at a sustainable rate; a just society toward all present and future inhabitants, in a way to be constantly agreed upon.

With these ideas I went to Haiti; hoping that the field work would help me to challenge the theory, refine thoughts and explore instruments; and it definitely did.

## Problem definition and objectives

It is little more than fifty years since the development discourse was born under the blessings of modernization theories and yet that set of beliefs seems now as distant as the Middle Ages. The ecological threats that the global society has now to face have in my eyes shifted the whole development concept from “help the others to become like us” to “help each other to survive”.

Transformation goes far too fast so that it is difficult to grasp reality and understand phenomena, but I argue that the most important response expected from this era of civilization is the capability to tackle the environmental problems that this same civilization has created. The nature of this challenge is geographically of planetary scale and it intrinsically entails every aspect of social life from economy to politics.

I believe that technology, not intended as industrialization but as technical solutions to practical problems, is going to play a crucial role in this race. Communication is thereby an essential component to enable the required flow of information from centers of expertise to the general public and governing structures. In this frame, the diffusion of innovation models for the transfer of information, where the communication primarily flows from a source to a receiver (see section 2.2), is justified as a tool to support the process.

One among the multitude of issues to be addressed is that of forests management. The crucial role of forests in ecological systems is indicated not just by the findings of science but also by the sacred role they assume in most human cultures and religions. A key question for the survival of today's global human civilization is whether it will be able to implement an adequate conservation policy or it will continue with the inconsiderate exploitation that has characterized the past century.

The gravity of the current situation is exemplified in the clear picture provided by the Haitian reality. Here specific factors combine to explain the present conditions but none of them is decisive in itself and the complex blend of elements is not peculiar to this particular country but resembles a more general status.

The contribution of this study will be the analyses of the communication dynamics of a reforestation campaign in Haiti.

### Importance of forests

Forests' importance exceeds the limits of environmental concerns to embrace economic interest and ultimately the possibility for humanity to prosper.

Forest economics. From a strictly economical point of view, the direct products obtained from forests are timber (used as firewood, to produce paper, and for construction) and other raw material. Moreover, to give a comprehensive evaluation of forest economics it is necessary to take into account also the ecosystem services that they provide:

- watersheds protection
- soil protection against landslides, erosion, and sediment runoff into streams
- rainfall generation by being an important step of the water cycle. Trees retain water in the soil and keep it moist. Water transpiration from the trees returns water to the atmosphere.
- habitat for much of the terrestrial plant and animal species, containing most of the biodiversity on earth; for instance, tropical forest cover 6% of the world's land surface but hold between 50% and 80% percent of the world terrestrial species of plants and animals. Losing small meaningless species is like losing the small meaningless rivets that keep together an airplane.
- air filtration removing carbon monoxide and other air pollutants
- carbon sinks, which is important for mitigating global warming
- land fertilization. The nutrient poor soils in tropical and equatorial areas often bear lush-appearing vegetation; but most of the nutrients in the ecosystem are contained in the vegetation rather than in the soil, so that logging and carting the logs away tends to leave the cleared land unfertile.

The economical indexes currently in use, like GNP (Gross National Product), are not suited to take into account natural resources. Turning a tropical forest into a plantation actually increases the GNP for a few years, because of the flux of money and jobs created that are required to clear the forest, the selling of the wood and the initial productivity of the crops. The loss of the mentioned ecosystem services cannot be measured by indexes like GNP; first because they are rarely accounted for in monetary terms, as they normally benefit an indigenous population outside of the economy flux of affairs; second, the effects would anyway become evident

in a longer time span than that of businesses (order of months) or of democratic political administrations (four of five years); finally, GNP does not give the possibility to distinguish between the use of renewable resources (forests that are properly managed with a balanced system of cutting and replanting) and not.



**Figure 1. Wood is commonly used to cook. Haiti was once covered with lush forest and is now mostly desertified.**

Haitian forests and world forests. The case of Haiti is meant to be an example for a much more widespread reality. Haitian socioeconomical issues might suggest that these kinds of problems are local and might not occur in other places. The case of Australia should convince us of the contrary.

“Australia’s number one environmental problem, land degradation, results from a set of nine types of damaging environmental impacts: clearance of native vegetation, overgrazing by sheep, rabbits, soil nutrient exhaustion, soil erosion, man-made droughts (when the cover of vegetation is removed, the land becomes directly exposed to the sun, thereby making the soil hotter and drier; which impede plant growth in the same way as does natural growth), weeds, misguided policies (in the past the Australian government formally required tenants leasing government land to clear native vegetation), and salinization” (p398, Diamond 2004)

“Australia has a well educated populace, a high standard of living, and relatively honest political and economical institutions by world standards. Hence Australia’s environmental problems cannot be dismissed as products of ecological mismanagement by an uneducated, desperately impoverished populace and grossly corrupt government and business, as one might perhaps be inclined to explain away environmental problems in other countries” (p379 Diamond 2004).



**Figure 2. Rural Haiti. On the left: School; kids of different ages sit on benches and write on their laps. On the right: Fountain; people come daily from neighboring villages to collect water, do the laundry and take a bath.**

## The country<sup>1</sup>

This indicates that the current environmental problems are changing the classical development discourse. Development is no longer a goal to be achieved by Third World countries imitating First World ones. It is a common challenge for the globalized planet to be reached in ways that world citizens should find out together.

Haiti is especially suited as an investigation sample since it is an extreme case where the effects of deforestation are clear and the urgency for intervention undeniable. Most of the population in Haiti lives with minimal public services, chronically or periodically without public electricity, water, sewage, medical care, and schooling.

An estimated population of 8.3 millions with an annual growth rate of about 2.3%. Life expectancy is extremely low (about 53 years) and infant mortality high. The population growth momentum is also worrying with a median age of 18 and about 42% of the population under the age of 15. Literacy rate is of about 53% in average but much lower in rural areas.

Deficient sanitation systems, poor nutrition, and inadequate health services have pushed Haiti to the bottom of the World Bank's rankings of health indicators. Less than half the population has access to clean drinking water while most rural areas have no access to health care, making residents susceptible to otherwise treatable diseases. Haiti has the highest incidence of HIV/AIDS outside of Africa.



**Figure 3. Plantation fields north of PauP. Agriculture (dominant cash crops include coffee, mangoes, and cocoa), together with forestry and fishing, accounts for about one-quarter of GDP and employs about two-thirds of the labor force**

According to the United Nations World Food Program, 80% of Haiti's population lives below the poverty line. This is no surprise since most people do not have formal jobs and survive through subsistence farming. Haiti uses very little energy, but still more than it produces; the most used and cheapest source being wood. Seasonal torrential rains ravage the roads already suffering from insufficient funding. Many of the country's bridges are no longer passable.

Fixed phones are mainly available in town but due to the frequent electricity shortages, mobiles are more diffused. Calls are relatively expensive. Rural areas are for the most part off net and coverage is also an issue. Radio reaches the widest audience while television is available only to a minority of relatively wealthy households. In places without electricity, even radio has limited presence. As many community radio channels are sponsored by international aid agencies the independence of their content is reduced.

In 2004 and 2005, MINUSTAH and the interim Haitian government struggled to restore law and order and lay the groundwork for national elections. However, Amnesty International reports that the efforts of the United Nations and Haiti's police force have largely failed to curb violent crime in the country, especially in the capital region. In particular, kidnappings have been a constant threat for everybody including the middle and lower class civil population.

Hopefully the understanding of what characterizes a successful reforestation program in the Haitian context can provide hints also valid for the rest of the world. I therefore considered a reforestation program carried out by the local chapter of an international NGO in the rural area of Anse Rouge district.

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<sup>1</sup> The data in this section are mostly taken from US Library of Congress, US.

In Chapter 1, I provide further relevant details about the history and culture of the country. Thereafter, I describe the NGO which I visited and its philosophical approach. In the last part of the chapter I introduce the specific reforestation project that I studied.



**Figure 4.** On the left: MINUSTAH forces base located close to the troubled and inaccessible area of Cité Soleil. On the right: the road from PauP to Gonaives flooded since hurricane Jeanne in 2004.

### **Development discourse**

Forests are vital local resources often exploited by exogenous forces, with little advantage for the local population, or by endogenous interests in the name of progress. In fact, the loss of forests represents a loss of capital for the local inhabitants and global citizens. This example raises several themes of development research: identity, ownership, democracy and empowerment, to cite a few, as it is not clear who is entitled to decide over this global resource and who should benefit from it and how.

Many of today's economical and social issues have a similar characterization (for example fishery industry and energy market). For this reason, reforestation exemplifies the importance of redefining the meanings of development. In spatial terms, a reforestation project does not involve the contraposition between north and south (meaning, rich and poor) but it is framed as a question of glocal interest acting at the local level. In terms of power, it is a process where nobody is in the position to teach and, on the other hand, every participating actor can learn; the experience produced can also be of use for other similar realities. In terms of ownership, it is not the intervention of extraneous forces on local affairs but a collective negotiation of interests. In Section 1 I explore some aspects of the development themes relevant to this subject and clarify my standpoint. I analyze how ecological threats, by challenging the positiveness of technological exploitations of natural resources and as well as the positiveness of the economical growth paradigms, are forcing the citizens of the planet to re-discuss what characterizes an ideal society and thereby the "development" strategies to achieve it.

### **Communication theory**

The core of this investigation is the communication dynamic and interactions between the NGO implementing the reforestation program and the affected group, in the light of their different backgrounds. Assuming that the idea of planting trees rather than cutting them can be seen as an innovation<sup>2</sup>, since it introduces a practice different from the one in use, I adopted as a theoretical framework the findings from diffusion of innovation (DoI) research. I therefore analyzed the communication strategy of the reforestation program in those terms and critically assessed some of the diffusion model's assumptions, especially concerning early adopters.

I believe that the analysis of a reforestation project has many aspects in common with the first literature studies produced in the diffusion of innovation field, namely the investigation of American farmers' adoption of new seeds or agricultural practices in the 1950s (Ryan, Bryce, Gross 1943/1950 in Rogers 2003). Similarly, in this case a new practice, planting fruits and forest trees, was introduced to the rural communities. The diffusion of this innovation, due to its specific characteristics, presents some special challenges. The intervention is to the farmers' benefit, but it also constitutes an investment for them, since the trees would not readily produce new

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<sup>2</sup> an idea, practice, or object that is perceived as new by an individual or other unit of adoption

income; it requires at least three years in case of fruit trees and many more for wood. Moreover, planting trees is a preventive measure whose beneficial effects are difficult to explain in an adequate manner to a largely illiterate population. [Section 2.2](#) treats in some detail diffusion of innovation theory's main constructs and also presents my own view points.

### **Qualitative research**

As an investigation tool I adopted a qualitative approach. As sociologist Jan Servaes suggests, "the world is constructed inter-subjectively through processes of interpretation" (p104 Servaes 1999). This same premise emerges also from an understanding in biological terms; from this point of view each individual develops a model of reality elaborating the signals sent to the mind by the sensory receptors. Also in this case the idea of reality is a subjective construction that finds confirmation in the interaction with other sentient entities. This implies that "given the idiosyncratic nature of individuals and cultures, social reality has predominantly the character of irregularity, instead of ordered, regular, and predictable reality assumed in the empirical approaches" (p104 Servaes 1999). This has important repercussions on the research method. Because of "the human character of the subject matter" Servaes argues that "qualitative and phenomenological approaches, in their broadest sense, advocate a human approach toward understanding the human context" (p104 Servaes 1999). What he calls human character I call the complexity of biological beings, but the different starting points lead nevertheless to the same conclusion. The relativity of human experience, given in my understanding by humans' biological nature, makes us part of what we observe. As Servaes elegantly expresses: "objectivity is nothing more than a subjectivity that a given aggregate of individuals agrees upon. [...] Hence, objectivity is nothing more than inter-subjectivity" (p99 Servaes 1999).

In [Section 3.1](#) I discuss the relevance of in-depth interview and participant observation as investigation tools and how they fit my purposes in this work.

### **Results and analysis**

In [Section 3.2](#) I present the main findings from the field work. Through the results provided by interviews, surveys and participant observations I analyze the NGO communication strategy and what implications it has for the implementation of the reforestation program. I further revise material deriving from the press about previous and current reforestation programs carried out by other actors, in order to frame the problem of forests from a broader perspective and to draw some conclusions about the interplay of elements between global and local levels.

# 1 Contextualization

Although a broad understanding of Haitian social reality would require a much deeper analysis and goes beyond the scope of this study, it is nevertheless important to take into account those aspects of Haitian culture that play an essential role in the definition of its environmental crisis. The roots of deforestation can be traced in the history of the country. On the other half of the same island a different sequence of events prevented that neighboring nation, the Dominican Republic, from ending up in the same condition. The current economic situation influences the use of the remaining forests in Haiti, and the political instability jeopardizes the success of reforestation programs. There is no evidence of cultural reasons explaining the diffuse activity of cutting trees. On the contrary, plants do hold a central role in the widely followed voodoo religion.

Another significant factor to consider when looking into the communication strategy of the reforestation program is the background of the implementing NGO; the specific set of spiritual values that characterizes the organization, heavily influences its modus operandi.

The reforestation project I visited is located in a rural area north west of Gonaives, in the district of Anse Rouge. The NGO has its base in the village of Sources Chaudes and also two centers in the capital Port au Prince (PauP). There is very little infrastructure development in the region around Sources Chaudes, and the quality of the few existing roads, schools, public markets and health clinics is very low due to lack of maintenance and properly managed stewardship. The area around AMURT's base in Sources Chaudes is socially and economically isolated. The economy is sustenance-based, and the region suffers from a high migration rate. The main economical activities are salt mining and fishing for the coastal villages, and farming and charcoal production for the land-locked areas. Hurricane Jeanne that occurred in 2004 has severely damaged or destroyed sections of roads, dry-riverbed crossings, public domain spaces, irrigation channels, private and public buildings; it also has impacted the salt mining and the farming, destroying farms and crops, washing away top soil, and filling the salt basins with mud and water. The unemployment rate for these villages is approximately 75% for people under 22, and 45% for people 22 to 55 years of age. Because of the political crisis in the country and its isolation, there are few government or NGO programs in the area.

## 1.1.1 Some traits of Haitian history<sup>3</sup>

Haiti has a uniquely tragic history. Natural disasters, poverty, racial discord, and political instability have plagued the small country throughout its history. It is difficult to understand Haiti's current situation without knowing some basic facts about its past.



Figure 5. On the left: 1492 - Christopher Columbus docks on the island of Hispaniola. On the right: under French colonial rule, nearly 800,000 slaves arrived from Africa.

**French colonization:** The original inhabitants of the island were annihilated within 50 years of Columbus's arrival. In the end of the 1600s France obtained from Spain the western third of the island of Hispaniola and

<sup>3</sup> The data in this section are mostly taken from US Library of Congress, US

turned it into a coffee- and sugar-producing juggernaut. As the indigenous population dwindled, African slave labor became vital to agricultural growth.

Under French colonial rule, nearly 800,000 slaves arrived from Africa, accounting for a third of the entire Atlantic slave trade. Already then Haiti had a population seven times higher than the Dominican Republic, and it still has a somewhat larger population today, about 10 millions versus 8 millions on a much smaller surface, which entails double the population density. "In addition, all of those French ships that brought slaves to Haiti returned to Europe with cargos of Haitian timber, so that "Haiti's lowland and mid-mountain slopes had been largely stripped of timber by the mid-19th century" (Diamond 2004).

By the 1780s, Haiti was the most valuable colony in France's overseas empire counting for nearly 40% of all the sugar imported by Britain and France and 60% of the world's coffee. But Haiti's burst of agricultural wealth came at the expense of its environmental capital of forest and soils as huge areas were cleared from existing vegetation and exploited. By the mid-eighteenth century, Haiti's society had settled into a rigid hierarchical structure based on skin color, class, and wealth. The elite identified strongly with France rather than with their own landscape and did not acquire land or develop commercial agriculture but instead sought mainly to extract wealth from the peasants.

**Independence and the indemnity payment:** During the latter eighteenth century, the fabric of the hierarchical society began to unravel. Slaves abandoned the plantations in increasing numbers, establishing runaway slave (maroon) communities in remote areas of the colony. By the beginning of the 1800s, after 300 years of colonial rule, the new nation of Haiti was declared an independent republic. It was only the second nation in the Americas to gain its independence and the first modern state governed by people of African descent. This heavily influenced its destiny as Haiti was not recognized by other free countries and became in many cases economically isolated. To gain some international acceptance one of its presidents, General Boyer, in the mid-1800s, negotiated a payment to France of 150 million francs (later reduced to 60 million francs) as indemnity for the loss of the colony. In exchange, France recognized the Republic of Haiti and restored trade relations. Although the indemnity helped secure Haiti's political independence, it imposed a crushing economic burden that weighed heavily on future generations.

**The twentieth century:** With the exceptions of short periods, Haiti did not have peaceful or stable governance. The U.S. government withheld recognition of Haiti until 1862, when wartime necessity compelled it to establish cordial relations with the strategic Caribbean nation. Between 1915-34 Haiti was occupied by US forces. The following regimes have often been characterized by dictatorship and corruption, even if some of them started with hopeful programs. The Duvalier family was among the worst. The methods used by François Duvalier "Papa Doc" were harsh even by Haiti's standards. His son, "Baby Doc," assumed leadership of Haiti in 1971 at the age of 19. He lived lavishly, siphoning off funds from the governmentally controlled tobacco industry, while Haiti descended further into poverty. In 1986, Haitian citizens revolted against the corruption-rife administration forcing Duvalier to give up the presidency. He went into exile in France.

**Aristide:** In 1990 outspoken anti-Duvalierist and former Roman Catholic priest Jean-Bertrand Aristide won a landslide victory. A fiery populist who elicited fanatical support from the poorest sectors of Haitian society, Aristide pledged to rid Haiti of the ethnic, racial, and economic hierarchy that had defined the country. He became a polarizing figure opposed by much of the country's elite and the armed forces. After only seven months in office, Aristide was ousted by a military coup. He was back in 1994. René Préval, his political ally and former prime minister, assumed power after him.

**Political Chaos and interim government:** In the summer of 2000, accusing the government of corruption, election fraud, and widespread human rights violations, Haiti's foreign donors suspended all development assistance. The same year, after a disputed election, Aristide returned to office. His second tenure as president (2001-4) saw an intensification of political violence, an economic recession, and a breakdown of government institutions and the rule of law. In February 2004 Aristide was again taken out of Haiti. In April 2004, the UN Security Council created the UN Stability Mission in Haiti (MINUSTAH). After several postponements, the first round of elections for president and the National Assembly took place on February 7, 2006. Former President Préval won the presidential contest with 51.15 percent of the vote.

### 1.1.2 The situation of forests: differences with the Dominican Republic

Today, 28% of the Dominican Republic is still forested, but only 1% of Haiti. Some environmental differences do exist between the two halves of the island and made some contribution to the different outcome. Hispaniola rains come mainly from the east. Hence the Dominican part of the island receives more rain and thus supports higher rates of plant growth.



Figure 6. Google Earth satellite images. On the left: different forest coverage in Haiti and the Dominican Republic. On the right: the area of Sources Chaudes, the vegetations is restricted to the area close to the water source the rest is bushes and cactuses.

Hispaniola's highest mountains are on the Dominican side, and the rivers from those high mountains mainly flow eastwards into the Dominican side.

The Dominican side has broad valleys, planes and plateaus, and much thicker soils; On the contrary the Haitian side is drier because of the barrier of high mountains blocking rain from the east. A higher percentage of land is mountainous, the area of flat land suitable for agriculture is much smaller, there is more limestone terrain, and the soils are thinner and less fertile and have lower capacity for recovery. The combination of higher population density and lower rain fall was the main factor behind the more rapid deforestation and loss of soil fertility on the Haitian side. Sociopolitical factors also influenced the different outcomes in the neighboring countries. Because the D.R. retained much forest cover and began to industrialize, dams were constructed to generate hydroelectric power. Moreover the D. R. imported propane and liquefied natural gas to substitute the use of charcoal for food preparation. But Haiti's poverty forced its people to remain dependent on wood-derived charcoal from fuel, thereby accelerating the destruction of its last remaining forests.

### 1.1.3 Religion and meaning of trees

About 80% of Haitians belong to the Roman Catholic faith. Many, however, mix Catholicism with traditional voodoo practices. As in every animistic religion, trees are sacred. They are represented by a dedicated God and also have an important function in framing the surroundings of sacred places. A detailed account of the role that trees play in Voodoo religion is given by French anthropologist Métraux:

"Every *humfo*<sup>4</sup> is encircled by sacred trees which may be recognized by the stone-work around them, by the straw sacks and by the strips of material and even skulls of animals hung up in their branches. [...] The *loa*<sup>5</sup> are present in the sacred trees which grow round the *humfo* and the country dwellings. Each *loa* has his favorite variety of tree: the *medicinier-béni* (*Tatropa cureas*) is sacred to Legba<sup>6</sup>, the palm tree to Ayizan<sup>7</sup> and the Twins<sup>8</sup>, the avocado to Zaka<sup>9</sup>, the mango to Ogu<sup>10</sup> and the bougainvillea to Damballah<sup>11</sup> etc. A tree which is a resting place might be recognized by the candles burning at the foot of it and the offerings left in its roots or hung in its branches. [...]. The spirit of vegetation is *Loco*. He is mainly associated with trees of which he is in fact the personification. It is he who gives healing power and ritualistic properties to leaves. Hence *Loco* is the god of healing and patron of the herb-doctors who always invoke him before undertaking a treatment. He is also the guardian of sanctuaries [...]. The worship of *Loco* overlaps with the worship of trees – in particular of the *Ceiba*, the Antillean silk-cotton tree and the tallest species in Haiti. Offerings for a sacred tree are paced in straw bags which are then hung in its branches. [...] Crops and agricultural labor are the province of the *loa*

<sup>4</sup> sanctuaries where members of fraternities gather to worship

<sup>5</sup> supernatural being: genie, demon, spirit, divinity

<sup>6</sup> the first of all loa

<sup>7</sup> Dahomean god

<sup>8</sup> Marassa, divine twins, male and female, usually represented as conjoined, i.e. androgynous (thus, a Self symbol)

<sup>9</sup> agriculture god

<sup>10</sup> warrior god

<sup>11</sup> serpent god. Also god of lightning

Zaka – the minister of agriculture of the world of spirits. First and foremost a peasant god, he is to be found wherever there is country. People treat him with familiarity calling him cousin” (Métraux 1959).



Figure 7. Vevé (symbol) of Loco and Eastern celebration in Jacmel: *Rara* procession.

### 1.1.4 The NGO: AMURT



Figure 8. Emblem of Ananda Marga, summarizes its ideology in a symbolic form. The upwards pointing triangle signifies work in the world, i.e. social work. The downwards pointing triangle signifies inner work, i.e. meditation. The sun means that the sum of work in the world and inner development leads to personal and spiritual development. The swastika signifies personal victory, in the sense of spiritual fulfillment and salvation.

Ananda Marga, officially known as Ananda Marga Pracharaka Samgha meaning “the organization for the propagation of the path of bliss” was founded in India in 1955 by Prabhat Ranjan Sarkar (1921-1990), known by his spiritual name of Shrii Shrii Anandamurti (or Ba’ba’ as I always heard them call him). Ananda Marga (AM) bases its ideology on the theory that total human development can only be achieved through both personal development and social service to the community.

Sarkar’s philosophy called for economic democracy, which is maintaining human rights, and giving control of the economy to the local level rather than “a handful of leaders [who] misappropriate the political and economic power of the state.” Sarkar said that science and technology should be guided by Neo-humanistic principles, which is the belief that one should extend humanism to love for animals and plants as well as people. He wanted the establishment of a welfare system and fair taxation, social and economic justice, women’s rights, and the creation of a world government with a global bill of rights, global constitution, and global justice system. Through a system of meditation techniques, yoga postures (asanas), spiritual gatherings, and social service the ananda margiis (followers of AM) strive to develop themselves as human beings, and the betterment of others.

**Tantra Yoga**, considered a practical science (intuitional science of the mind), is an important practice for AM followers. Tantra means “liberation through expansion” and so the practice of Tantra yoga is to free one’s mind. According to this credo the universe is a part of Brahma which is the Supreme Conscious Being. Brahma is split up into two parts, the Eternal Consciousness (Shiva) and creative power (Shakti). All living things identify with material and mental goods made by Shakti. Humans can increase their identification with Shiva, through meditation. By reestablishing equilibrium between Shakti and Shiva, a person can return to a state of Eternal Bliss or the state of Brahma. Brahma can be experienced through Tantra Yoga by exploring and mastering the mind to the point where it realizes its connection with Brahma.

**Initiation.** When the student decides to aspire on the path of bliss s/he will be initiated by a qualified meditation teacher called acharya, *sanskrit* for teacher. An acharya is most commonly a monk or nun, but there are also a few family acharyas in the Ananda Marga tradition. In the initiation the aspirant makes a commitment to

practice meditation, and is then taught the technique itself. The aspirant is then required to keep all his practices secret and not discuss them with others. In PauP there are two acharyas, a Dada (male) and a Didi (female) each one in charge of one of the two schools.

**Social and Spiritual Practices** were created by P.R. Sarkar to help its followers to reach the balance of physical, mental, and spiritual parts of human life, and these guide everyday life. Members of Ananda Marga are encouraged to try and follow these points as strictly as possible. They concern personal hygiene, diet and various physical and spiritual routines. *Kiirtan* (spiritual dance that loosens the body to help the ease of movement and also helps create a calm state of mind) and *Dharmacakra* (the weekly collective meditation sessions) are among the ones familiar to me. Instructions are often quite specific as shown by the following examples.



"It is preferable to eat sentient food rather than mutative food, while static food should be avoided." The reason for this is that mutative foods contain stimulants and static foods requires one to kill an animal and is unhealthy for the body. Meals should be eaten at regular times throughout the day and no more than four meals should be eaten. Other meal etiquette should be followed such as not eating when one is not hungry, drinking plenty of water throughout the day, and eating with others rather than alone. Members of Ananda Marga should fast the eleventh day after the full or new moon, and should not eat food or drink water during this time. A person that is pregnant or suffers from medical ailments does not need to fast. "Fasting generates willpower" and "generates empathy with the sufferings of the poor and also of animals and plants."

**AMURT** (Ananda Marga Universal Relief Team) is the part of AM dedicated to social service. The ideology of the group is universal and it stresses the unity of human society. The group has thus a strong commitment to bring progress to the whole of human society (and other creatures) by doing service for suffering people in all kinds of ways. To this effect, Sarkar created organizations such as AMURT and AMURTEL (specific for women). Over the years AMURT and AMURTEL established teams in eighty countries. Their mission is to help the poor and disadvantaged people of the world, to break the cycle of poverty and gain greater control over their lives. Development is human exchange: people sharing wisdom, knowledge and experience to build a better world. They believe that the best assistance is that which encourages and enables all people to develop themselves. Hence they help individuals and communities to harness their own resources for securing the basic necessities of life and for gaining greater economic, social and spiritual fulfillment, while respecting their customs, language, and religious beliefs. The philosophy of Neo-Humanism is carried over into education through Ananda Marga schools located throughout the world.



Figure 9. On the left: AMURT's volunteers and employees during the visit of donors' agency CRS (Catholic Relief Service). On the right: Véve, responsible person for the solar cooking training program, receives the inspector from CRS.

### 1.1.5 The project<sup>12</sup>

**Problems and solutions:** the sustained practice of random and uncontrolled clear-cutting in the area of Anse Rouge, has resulted in a devastating degree of desertification and a range of negative effects such as soil loss, gully erosion, dust storms, the decrease of natural protection from flashfloods, and an increase in the severity of hurricane impact on the area. The loss of land cover has also impacted the availability of surface and ground water, thus placing additional strain on the relationship between the various water users.



Figure 10. On the left: Women working on filling plastic bags with soil and compost at the tree nursery. AMURT has a policy of employing 50% of women in all its projects. On the right: children planting a tree.

The project addresses these problems by rehabilitating the destroyed water supply and irrigation system, by building water filtration and conservation systems, and by initiating a broad reforestation and watershed protection program. Each initiative is preceded by a process of grassroots community organization, to increase local capacity, and establish a structure that will enable further community development in the area.



Figure 11. On the left: Agronom Gilbert responsible for the tree nursery in Tite Place. On the right: Gilbert holds a lesson in the school “Le plateau des orangines” (the name of the locality is all that is left of the original plantation of oranges).

**Background:** In 1984 SNEP together with UNICEF completed a water supply system, which connected nine villages to a spring in Tite Place. As a result of poor management, misutilization of water, and a lack of

<sup>12</sup> Extract from the proposal written for CRS by AMURT’s project coordinator Demeter Russafov, Project ID: CRS - DRP 105.01. Title: Projet Réhabilitation System D’Eau Potable, Filtration D’Eau, et Reforestation, Anse Rouge (Community Water Supply, Filtration, Irrigation, And Watershed Management). Time Frame: July-December, 2005. Donor agency: CRS (Catholic Relief Service)

mediation, tension mounted amongst the different villages leading to the eventual destruction of the water supply pipe in 2001.

When AMURT first arrived in the area it found an atmosphere of mistrust and mutual blame, resulting in constant sabotage of any attempts to resolve water conflicts between the coastal villages and the mountain villages. The coastal villages had better infrastructure, better schools, and a small fishing and salt mine economy, yet they lacked drinking and irrigation water. The mountain villages, on the other hand, had a sufficient water supply, yet lacked infrastructure, schools, clinics, irrigation channels, etc.

A series of public forums facilitated and mediated by AMURT resulted in a breakthrough agreement between the coastal and mountain villages. The plan allowed the coastal zones to receive drinking and irrigation water supply, and the mountain villages to benefit from improved infrastructure and education.



Figure 12. On the left: Environmental education seminar for teachers, Tite Place. The seminar combined lectures, practical workshops in the tree nursery, cooperative exercises and other classes over a period of 3 days. It was received enthusiastically by the participants, who requested AMURT to conduct it on a monthly basis. On the right: woman, single mother of five, shows “AMURT’s cauliflower”, as she called it.

**Activities** (limited to the focus of this study, i.e. watershed management and reforestation):

- Establish watershed management committees and tree stewardship clubs in each of the villages benefiting in order to ensure local involvement and self-management.
- Locate and organize members of the population interested in environmental protection with the purpose to build, train and support a network of volunteer community reforestation stewards.
- Educate the public about the importance of watershed protection, and about the connection between forestation and water tables, erosion, and hurricane impact.
- Establish a tree nursery and seedling distribution center at Tite Place, targeting the planting and maintenance of 1000 fruit trees (mango, citrus, coconut, and avocado) and Neem. The total targeted number of trees will increase as much as 5 to 8 fold if we calculate the additional seedlings that will be coming out of the tree nursery in the months following the program.
- Direct a sustainable agriculture community education program targeting schools and farmers.

The trees and seedlings are distributed for free to farmers and villagers. Reforestation of certain kinds of trees and plants will prepare the ground for cooperative economic initiatives in the future. Neem tree introduction, for example, could lead to a Neem oil extraction cooperative producing health products, soap, and toothpaste. Many other native and introduced medicinal plants can be grown and harvested by locally managed cooperatives, and used locally to minimize the costs of health care.

## 2 Theoretical background

### 2.1 Crisis of developmentalism

#### 2.1.1 Development paradigms

Development theory emerged as a separate body of ideas following the Second World War with the stated intent to address the imbalance between rich and poor countries. The dominant paradigm was *modernization*. According to this theory development is measured by means of *quantitative parameters*, predominantly economic like productivity, industrial base and urbanization, but also literacy, democracy and life expectancy. Economy in its turn is based on the idea of *incessant growth* (Rostow 1960). Western or industrialized countries are considered to be developed and represent the political, economical and technological model to be followed in order to achieve development. The path to development is seen in *evolutionary* terms, as going through several stages of transformation on the line of western history (White 1959, Parsons 1966). The goal of development is to be achieved through a massive transfer of capital and culture (ideology, values, technology and know-how) to underdeveloped countries. A *top-down* approach characterizes the implementation methodology, where programs are applied regardless of the background, orientation and will of the subject to which they are directed.

One of the most powerful critiques of modernization/diffusion theories came from the *dependency paradigm*. Originally developed in Latin America (Prebisch 1950), dependency analysis was informed by Marxist and critical theories according to which the problems of the Third World reflected the general dynamics of expansion of Western capitalism: it created an unequal distribution of resources, making the problems of the underdeveloped world political, rather than the result of the lack of information (Frank 1971). The dependency paradigm emphasizes the role of imperialistic exploitation in European modernization and the need for social change in order to transform the general distribution of power and resources (Wallerstein 1979).

What modernism and dependency have in common is economism, since growth is still the centerpiece of development; teleology in that the common assumption is goal-oriented development; and centrism because development is led from where it is furthest advanced: the metropolitan world.

*Participatory theories* attack the top-down approach, and the ethnocentric and paternalistic sensibilities that are associated with a Western vision of progress. For participatory theorists and practitioners, development communication requires sensitivity to cultural diversity and specific context (Freire 1970). The concept of *another development* was first introduced, along with these arguments, in the industrialized nations of northern Europe (Dag Hammarskjöld Foundation 1975). It emphasizes cultural identity, empowerment and multidimensionality.

In a continuous transformation over the years and in line with the development of western sensibility, several other theories, each emphasizing different aspects (gender, ecology, self-reliance, sustainability, ethnicity, culture and globalization) have been emerging in critiques of the modernity paradigm, creating a multiplicity of viewpoints and characterizing a pool of *alternative developments*. Intervention is carried out by different actors other than nations or international institutions, such as private foundations and non-governmental organizations. An extreme stand, among this amalgam of positions, is held by *post development* which brings the critique to the verge of anti-development or alternatives to development itself (Escobar 1995). In the words of sociologist Jan Nederveen Pieterse: "Post-development is not alone in looking at the shadows of development; all critical approaches to development deal with its dark sides. Dependency theory raises the question of global inequality. Alternative development focuses on the lack of popular participation. Human development addresses the needs to invest in people. Post-development focuses on the underlying premises and motives of development, and what sets it apart from other critical approaches is its rejection of development" (p100 Pieterse 2001)

#### 2.1.2 Ecological perspective

The ecological perspective, which entails the critique toward modernism's economic models and ethnocentrism, will be a central focus in this work.

“The crisis of developmentalism as a paradigm manifests itself as a crisis of modernism in the west and a crisis of development in the south. The awareness of ecological limits to growth is a significant part of the crisis of modernism” (p27 Pieterse 2001).

It remains a widespread consensus among pro-development forces that western societies are successful and that they are the model to follow. This might look like a reasonable assumption when judgment is made on the basis of a specific choice of parameters and over a relatively short span of time. But in a broader and longer perspective it is not. It suffices to look at past civilizations, see how they started, prospered and eventually died, often committing ecological suicide, to draw different conclusions.

As the American evolutionary biologist, physiologist, bio-geographer and nonfiction author Jared Diamond wrote in his book *Collapse*: “Discoveries made in recent decades by archeologists, climatologists, historians, paleontologists, and pollen scientists, confirmed the suspicion that many of past societies’ collapses [“a drastic decrease in human population size and or political/economic/social complexity, over a considerable area, for an extended time”] were at least partially triggered by ecological problems” (p6 Diamond 2006).

The list of unsustainable practices that led to environmental damage in the past, is amazingly reminiscent of any of the numerous reports that environmental agencies are producing in our time (Millennium Ecosystem Assessment 2005, EU sustainable development strategy 2005, UN 2006)

“The process through which past societies have undermined themselves by damaging their environments fall into eight categories: deforestation and habitat destruction, soil problems (erosion, salinization, and soil fertility losses), water management problems, overhunting, overfishing, effects of introduced species on native species, human population growth, and increased per capita impact of people” (p6 Diamond 2006).

But contemporary societies also have to face new factors: “humans caused climate change, buildup of toxic chemicals in the environment, energy shortages, and full human utilization of the Earth’s photosynthetic capacity” (p7 Diamond 2006).

For German sociologist Ulrich Beck the consequences of scientific and industrial development are a set of risks and hazards unrestricted in space (they cross national boundaries) and time (future generations are affected) so crucial for our civilization that they are characterizing it. “Environmental problems are not problems of our surroundings but – in their origins and through their consequences – are thoroughly social problems, problems of people, their history, their living conditions, their relation to the world and reality, their social, cultural and political situation. [...] nature is society and society is also nature” (p81 Beck 1992).

Civilizations are fueled by the resources that allow them to exist. Human kind, as any other form of life, prospers using the resources that the environment provides. Civilizations develop using those resources, some in sustainable ways, other not. The way resources are used strongly influences the civilization life span. In this sense the supremacy of western societies’ lifestyle in the game of survival in respect to other civilizations still has to be proved.

### **2.1.3 Environment**

“The importance of environmental concerns and sustainability has weakened the economic growth paradigm” (p80 Pieterse 2001)

A weakening of the economic growth paradigm can be found in academic environments, but its widespread use still steers the reality of business and politics. This might be the case since there is a tendency to consider environmental concerns as secondary in respect to economic and social ones. But the truth is that environmental problems are at the base of and inextricably linked to all other aspects of a society’s success.

One of the critiques against modernization is its failure in introducing industrialization in the targeted countries. In fact, the problem is the opposite; it is the adoption by the nonwestern world of western economical models and ways that poses the greatest threat to the planet and to the prosperity of many plant and animal species including humans.

Emerging economies are becoming part of the industrialized world, not just approaching Western performances but threatening Western supremacy (the discouraging fact is that there are no signs of correlation between western aid and success). Unfortunately for all the problems it creates, the process is happening in the way modernism had wished, or neo-liberalist forces are preaching. Namely, through industrialization and market criteria. Now people in developing countries aspire to industrialized countries living standards.

One insight into this problem is that the average resource consumption and waste production of one person (per-capita human impact) is much higher for modern first world citizens than for developing countries citizens or for any people of the past.

“Third World citizens are encouraged in that aspiration (to adopt western living habits) by First World and United Nations development agencies, which hold out to them with the prospect of achieving their dream if they will only adopt the right policies, like balancing their national budget, investing in education and infrastructure and so on. But no one in First World governments is willing to acknowledge the dreams’ impossibility: the unsustainability of a world in which the Third World’s large population were to reach and maintain current First World living standards”. (p496 Diamond 2006)

Of course to maintain the present disequilibrium is neither possible nor desirable; besides, it would not help, since the story does not end here.

“Even if the human populations of the Third World did not exist, it would be impossible for the First World alone to maintain its present course, because it is not in a steady state but is depleting its own resources as well as those imported from the Third World.” (p496 Diamond 2006).

A new urgent meaning for development would be to turn sustainability into development’s leitmotif because there is no economy, nor social equity, nor peace, gender equality or participation in a nation without enough natural resources (like water, crops, fish, animals, forests and renewable sources of energy) to nurture all its citizens.

## 2.1.4 Critique of science

The critique of western modalities toward economy and the environment has been associated with the critique of scientific instrumental modes of thoughts.

“Part of the critique of modernism is the critique of science. A leitmotif, also in ecological thinking, is to view science as power. ‘Science’ here means Cartesianism, Enlightenment thinking and positivism as an instrument in achieving mastery over nature” (p102 Pieterse).

Indeed, interventions in development have been made in the name of science and the status of technology has been overly prized. The level of technological “progress” has been often used as a measure of a community well-being, following the simplified and misjudging logic of, for example, “no cars, no happiness.” On the other hand, since the very moment mankind started to produce tools, technology has been there. Technology is a part of the natural world: used by chimps when fishing termites, used by termites when building their air-conditioned nests and so forth. Industrialization is not to be confused with technology and science.

Developed countries are entering the post industrialization era and they are doing so accompanied and pushed by science and technology.

If there is a chance for humanity to overcome the socio-economic-environmental difficulties of this century, it is exactly through the same technology that, used in a predatory way, has provoked the numerous ecological catastrophes of our time.

To point at the instrument instead of focusing on the hand holding it, is a strategy bound to failure. Instead of rejecting technology, Beck introduces the concept of *reflexive modernization* of industrial society which is “based on a complete scientization, which also extends scientific skepticism to the inherent foundations and external consequences of science itself” (p155 Beck 1992). Indeed, the critique of modernization is grounded upon the findings of science’s “threats [that] require the sensory organs of science – theories, experiments, measuring instruments – in order to become visible and interpretable as threats at all” (p162 Beck 1992).

The radicalization of scientific rationalization leads to critical assessment of development modes.

“Development thinking is steeped in social engineering and the ambition to shape economies and societies, which makes it an interventionist and managerialist discipline. It involves telling people what to do – in the name of modernization, nation building, progress, mobilization, sustainable development, human rights, poverty alleviation, and even empowerment and participation” (p139 Pieterse)

The aspiration to manipulate societies as if they were objects that can be described by models and whose behavior can be simulated and predicted reveals an arrogant attitude not justifiable with faith in science; if anything it shows a poor understanding of the principles of the scientific method. To be able to shape economies and societies would be indeed convenient, if it were possible. Unfortunately it is not. Societies are far too complex systems for that purpose.

This is one of the main mistakes of modernization, the presumption of knowing better, not its supposed special closeness to science. Science does not even have to be related with western culture, there are no principled grounds on the basis of which indigenous knowledge can be distinguished from scientific knowledge, and scientific knowledge is increasingly being produced by diversified actors. A net gain for everybody would be a combination and blending of knowledge systems.

To conclude, "scientific development undermines its own delimitations and foundations through the continuity of its success" (p164 Beck 1992).

### 2.1.5 Mastering of nature

"Do you think you can take care of the universe and improve it?" (Lao Tsu, 6<sup>th</sup> century BC in Pieterse 2001).

The way we live and use science and technology derives from the way we see the world. The metaphor of growth has a biblical flavor and strongly reminds of monotheistic religions, preaching: *go forth and multiply*. History is seen as a messianic course and modernization as its pursuit. According to Christianity, the planet has to sustain God's preferred creatures just right until the moment of Universal Judgment; after that it loses its meaning and therefore there is no requirement of preservation of nature outside the strict needs of this goal. It is a linear destiny.

In a highly influential article published by Science in 1967, historian Lynn White wrote: "Christianity inherited from Judaism not only a concept of time as non repetitive and linear but also a striking story of creation. [...] Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: no item in the physical creation had any purpose save to serve man's purposes" (White 1967).

The anthropocentric vision of Christianity informed modernism and the way science has been used. Mastering of nature thus becomes the attempt to reconstruct the heavenly place that was once built for humans by God. Mother earth is seen as a commodity that provides plants, animals and other resources to be used by humans as opposed to an ecological system of which humans are a part.

"Especially in its Western form, Christianity is the most anthropocentric religion the world has seen. [...] Man shares, in great measure, God's transcendence of nature. Christianity, in absolute contrast to ancient paganism and Asia's religions (except, perhaps, Zoroastrianism), not only established a dualism of man and nature but also insisted that it is God's will that man exploit nature for his proper ends" (White 1967).

These premises encourage a predatory attitude to consume what is offered with no constrictions, as opposed to other philosophical positions based on the idea of cyclicity in which beings are bound to go through life over and over and everything is related and linked to everything else. Mastering of nature has been a powerful sentiment across Christianity that has pervaded all aspects of culture including science.

Echoes of this need to control and steer, and the feeling of being able to do so, gained strength in physics in the period starting with the Enlightenment. For some centuries, the belief that given enough knowledge about a certain system it would be possible to predict that system's behavior in the future or under different circumstances acquired credibility. A tendency of thought, determinism, developed around the concept that every event is causally determined by an unbroken chain of prior occurrences. To fully understand the concept and its limitations it is useful to look closer at its original meaning.

A system is described by mathematical models in order to be able to make predictions. Description implies that salient parameters have to be isolated and that the representation of the system's properties has to be translated into mathematical terms. Considering a system like the earth atmosphere, relevant parameters can include for example temperature, pressure, and the amount of particles dispersed in the air, their types, velocity and position in a given moment. Determinism in this case says that, given all information (about each single breeze and distribution of temperatures and butterfly-movements), it is possible to make an exact weather forecast. Of course to collect all the necessary information is not possible, but according to determinism the imperfection of forecasts resides in the lack of details.

It should be by now clear that determinism is a quite abstract exercise, but the salient implication is that, as a consequence, predictions are expected to get more accurate as the amount of information increases.

Now, already here, the importance of information about initial and boundary conditions should be stressed. It is a relatively easy task to measure parameters like temperature, pressure, velocity, gas composition (although not for every point constituting the space and at any given time). And yet weather forecast is far from being perfect. Another thing is observing, analyzing and modeling more complex systems whose behavior is influenced by the vastly unknown dynamics of ecology, let alone human factors.

"If natural systems were well understood and behaved in a predictable way, it might be possible to calculate what would be a 'safe' amount of pressure to inflict on them without endangering the basic services they provide to humankind. Unfortunately, however, the living machinery of Earth has a tendency to move from gradual to catastrophic change with little warning. Such is the complexity of the relationships between plants, animals, and microorganisms that these 'tipping points' cannot be forecast by existing science" (Millennium Ecosystem Assessment 2005).

The identification of ruling parameters and their measure is thus a solid limitation to the hope of understanding complex systems (economic, social, ecologic), which is the first unavoidable step in the path of gaining the ability to master them. Therefore, even following the most positive deterministic attitude the task of predicting the behavior of societies and influencing it toward desired outcomes is an improbable one. Furthermore, determinism has been questioned by more recent scientific positions.

Quantum mechanics asserts that it is not possible, not even in principle, to accumulate information with absolute precision because the instrument of measure itself has limited accuracy (Heisenberg uncertainty principle).

Chaos theory adds that while some systems behave in a predictable way (i.e. given the same set of initial and boundary conditions they will display the same behavior; or given a slightly different set of conditions they will produce a slightly different solution), others do not. In particular a tiny difference in the initial or boundary conditions, so small that it cannot be detected by measuring instruments or that cannot be taken into account during computer calculations because it is smaller than the precision of the computer, can lead to outcomes that are totally different from each other (Lorenz butterfly effect).

For the field of development this is no good news: nature cannot be mastered and human societies cannot be engineered, not even with a faster CPU processor.

"Now chaos theory confirms what anthropologists have known all along: that complex adaptive systems often exist on the edge of chaos" (p144 Pieterse 2001).

The immediate consequence is that development interventions are a delicate business.

"Many so-called traditional ways of life involve a sophisticated, time-tested social and ecological balance. That outside interventions can do more damage than good is confirmed by the harvest of several development decades" (p143 Pieterse 2001).

The extension of chaos theory insights to other contexts suggests that development is dealing with systems too complex to be modeled in a sensible way, such that it is difficult to predict the outcome of most interventions and especially drastic ones. Also, the extrapolation of programs from one place to another does not help their success rates, since the ramification of small differences in local conditions and culture can lead to totally different results.

## **2.1.6 Ecological economics**

Leaving thus scientific approach and technology out of the debate and addressing instead culture and beliefs, we now focus on the association between development and economic growth. If the goal of global survival has to be achieved, the present widespread economical models and mindset based on growth have to be changed. According to the economic growth paradigm, a nation should continuously increase its gross national product, a company should constantly increase its profit, and the market should expand. Among the voices urging for a new paradigm is that of economist Robert Costanza.

"Stories about the economy typically focus on Gross Domestic Product (GDP), jobs, stock prices, interest rates, retail sales, consumer confidence, housing starts, taxes, and assorted other indicators. The 'economy' we usually hear about refers only to the market economy – the value of those goods and services that are exchanged for money. Its purpose is usually taken to be to maximize the value of these goods and services – with the assumption that the more activity, the better off we are. Growth in GDP is assumed to be government's primary policy goal and also something that is sustainable indefinitely" (Costanza, 2006).

In mathematical description of systems, conservation equations are used. The key word there is balance, not infinite expansion. So much comes in, the same amount goes out after being transformed. Growth is indeed

possible when a new resource is exploited: with the colonization of a new continent; or the introduction of agricultural innovations that increase crop yields; or with the acquisition of new energy sources.

The problem is that as the possibilities of finding new niches decrease, the concept of growth reaches its limits. In fact, in this specific historical period new findings are needed just to balance the loss of fuel sources that we soon are going to face. To put it simply, assuming the availability of a stable amount of resources (which is a remarkably optimistic assumption given the current circumstances), growth is possible just at the expense of somebody else's reduction; and there is not such a thing as global growth.

Too often the market logic is used to justify measures without being questioned, both in "developed" and "developing" countries. The goal of economy should be that of making a society prosper. Is the economic growth paradigm suited for this purpose? As the British economist Richard Layard argues, the prosperity of a society could be defined using the *Greatest Happiness Principle* first formulated by the nineteenth-century English jurist, philosopher and social reformer Jeremy Bentham: "The best society is one where the citizens are happiest". In his book "Happiness" Layard presents interesting results: when people become richer compared to other people they become happier, but when whole societies have become richer they have not become happier.

"The purpose of the economy should be to provide for the sustainable well-being of people. That goal encompasses material well-being, certainly -- but also anything else that affects well-being and its sustainability. This seems obvious and non-controversial. The problem comes in determining what things actually affect well-being and in what ways. There is substantial new research on this 'science of happiness' that shows the limits of conventional economic income and consumption in contributing to well-being" (Costanza, 2006).

And yet classic development's favorite target has been poverty, as perceived from outside, as created by development itself.

"If within the market societies the poor were defined as lacking what the rich had in term of money and material possession, poor countries came to be similarly defined in relation to the standards of wealth of the more advantaged nations. This economic conception of poverty found an ideal yardstick in the annual per capita income. [...] And if the problem was one of insufficient income, the solution was clearly economic growth" (Escobar 1995).

### **2.1.7 Poverty and the idea of happiness**

"Culturally perceived poverty need not be real material poverty: subsistence economies which serve basic needs through self-provisioning are not poor in the sense of being deprived. Yet the ideology of development declares them so because they don't participate overwhelmingly in the market economy, and do not consume commodities provided for and distributed through the market" (p100 Pieterse 2001).

Poverty is in the eyes of the beholder. In fact several subsistence economies of the past have been prospering, inhabiting the same land for thousands of years, while the survival of the present market economy is going to be the challenge of this century: we cannot be sure that the outcome will be positive.

German sociologist Wolfgang Sachs "distinguishes between frugality, as in subsistence economies; destitution, which can arise when subsistence economies are weakened through the interference of growth strategies; and scarcity, which arises when the logic of growth and accumulation has taken over and commodity-based need becomes the overriding logic" (p100 Pieterse 2001).

It can be added that subsistence economy does not need to be seen as a destiny of feeding on bread and water, as a Neolithic nostalgia. It can be high-tech subsistence. The shift is not (just) on comfort, the shift is from the culture of consuming to the culture of saving.

Still, governments are not interested in how happy people are, and focus instead on their combined purchasing power, assuming their preferences are constant over time. Layard questions this assumption, stating that our wants are not given in the manner that elementary economics assumes. In fact, they depend heavily on what other people have, and on what we ourselves have become accustomed to. They are also affected by education, advertising and television.

Layard proposes seven factors influencing happiness: family relationships, financial situation, work, community and friends, health, personal freedom and personal values. Some of the seven factors have improved in western countries in the past 50 years: health, income and the quality of work. But some have deteriorated: family relationships, the strength and safety of communities and the prevalence of unselfish values. Since 1952 Americans have been asked whether they are satisfied with their financial position. Although real income per head (corrected for price inflation) has nearly doubled, the proportion of people who say they are pretty well

satisfied with their financial situation has actually fallen. It follows that if we want to measure the quality of life, it must be based on how people feel and not on how much they consume.

“Happiness should become the goal of policy, and the progress of national happiness should be measured and analyzed as closely as the growth of GNP.” (Layard 2004)

A more suitable indicator to assess the “real” economy – all the things which contribute to real, sustainable, human welfare – as opposed to only the “market” economy, should consider the non-marketed contributions to human well-being: from nature, from family, friends and other social relationships at many scales, and from health and education.

One convenient way to summarize these contributions is to group them into four basic types of capital that are necessary to support the real, human-welfare-producing economy: built capital (factories, offices, and other built infrastructure and their products), human capital (spending on labor, health, knowledge), social capital (formal and informal networks among people), and natural capital (the world’s ecosystems and all the services they provide; ecosystem services occur at many scales, from climate regulation at the global scale, to flood protection, soil formation, nutrient cycling, recreation, and aesthetic services at the local and regional scales). Based on these concepts a parameter, Genuine Progress Indicator (GPI), has been introduced (Costanza 2005).

“GDP is not only limited – measuring only marketed economic activity or gross income – it also counts all of this activity as positive. It does not separate desirable, well-being-enhancing activity from undesirable well-being-reducing activity. For example, an oil spill increases GDP because someone has to clean it up, but it obviously detracts from society’s well-being. From the perspective of GDP, more crime, more sickness, more war, more pollution, more fires, storms, and pestilence are all potentially good things, because they can increase marketed activity in the economy” (Costanza 2005).

## **2.1.8 Redefinition of development as global transformation**

The repercussions of the principle of Greatest Happiness for development are once again pushing western countries away from being the model to follow. Not only does the western economic model produce ecological problems; it does not even make people happier.

“Western ethnocentrism as the implicit culture of developmentalism is no longer adequate in the age of polycentrism in a context of high interaction, or globalization. In relation to global concerns such as ecological questions the West is no longer a privileged interlocutor” (p60 Pieterse 2001).

The very notion of development is increasingly being bracketed. What is development if there is nothing to develop into?

Indeed the term “development” implies the idea of transforming toward something better. Originally, according to modernization, it was understood as transforming toward western societies, with their technology, democracy, economy. History is now showing us that there is not a preferential direction where some countries can work as models for the others but all societies are developing and the entire world is in transition.

Development has been associated with evolution but evolution itself has been largely misinterpreted. “Development” as well as the common misreading of evolution entails a positive flavor; implying a transformation toward something better; which is not necessarily the case.

Societies come and go; species on earth come and go, mostly by hazard. In the business of life there is no evolution toward something better but adaptation toward forms that allow to better exploit the available resources. That is by no means the same thing, since available resources are changing in time. In the process, giving it enough time, forms of life increasingly reached higher levels of complexity; building survival solutions over existing ones, exploiting new opportunities randomly created by mere life activity. This does not mean that forms of life are getting better in any sense. Better for what? Survival is the only thing that matters when it comes to life matters, and more complex forms of life are not better at surviving. Once again bacteria are a magnificent example to prove this point; so perfectly engineered that they were there from the beginning and still surviving well after millions of years and showing no sign of a weakening of their fortunes.

Following the parallel between evolution and development, this means that the process that societies undergo is one of transformation to adapt to different conditions, not to become better than they were but to better fit the changed circumstances.

What is needed is “redefining development no longer as ‘improvement’ but as a collective learning experience. This includes learning about different understandings of improvement, as a collective inquiry into what constitutes the good life and sensible ways of getting there” (p159 Pieterse 2001).

Rethinking of development should move toward social transformation and sustainability at the global and local level, a process that is not reserved to developing countries but to all societies as a part of a social process. American economist and writer David Korten defines development as transformation toward justice, inclusiveness and sustainability.

“With redefining development comes a different assessment of international development cooperation. The general trend is away from development assistance to cooperation and partnership” (p82 Pieterse 2001).

To move away from assistance is an important step. Aid is a problematic field where ethics and moral principles and various other interests are blended in a sticky mixture, neither the one nor the other; aid in exchange for souls, aid for an open market, aid for advertisement, aid for political affiliation and ultimately aid to gain a position of superiority; to be on the right side of the aid flux as a self-definition of being the one that succeeded.

To conclude, “critical holistic development includes macroeconomic management, global democratization and planetary ethics. Identifying with the whole means that development can no longer be simply geared to material aims and achievements but includes non-material dimensions, as in cultural development. It means that development can no longer be anthropogenic but encompasses the planetary ecology. Stretching the meaning of development to its fullest, it might be summed up as a collective learning process of human self-management according to the most comprehensive standards conceivable and practicable” (p148 Pieterse 2001).

## 2.2 Diffusion of innovations theory

### Communication models in brief

As synthesized by sociologist Jan Servaes, “the *modernization paradigm*, dominant in academic circles from around 1945 to 1965, supported the transfer of technology and the sociopolitical culture of developed societies to ‘traditional’ or ‘underdeveloped’ societies. The *dependency paradigm* was widely accepted among scholars as a relevant framework for analyzing international relations from the mid-1960 to the early 1980s. Since then the emerging *multiplicity paradigm* is gaining ground in academic circles. At the more limited level of communication for development one can distinguish between two basically different models that build on these more general development paradigms: the mechanistic *diffusion model* versus the organic *participatory model*” (p17 Servaes 1999).

In the diffusion model the role of communication was to transfer technological innovations from development agencies to their clients, and to create a propensity toward acceptance of change among the public. While from a modernization perspective development mainly arose from western sources; from a dependency point of view it had to be indigenous. However, the role assigned to communication was basically similar: an elitist, vertical or top-down process.

As described by Servaes, the participatory model incorporates the concepts in the emerging framework of multiplicity/another development. It stresses the importance of the cultural identity of local communities and of democratization and participation at all levels – international, national, local, and individual. It points to a bottom-up strategy not merely inclusive of but largely emanating from receivers. The communication process becomes one of reciprocal collaboration while experts and development workers respond to existing needs rather than imposing policies from above. The emphasis is on information rather than on persuasion. “In essence, participatory development involves the strengthening of democratic processes and institutions at the community level and the redistribution of power” (p93 Servaes 1999).

While in the traditional development context, whose interest is directed toward interventions in developing countries, diffusion and participation might seem in contraposition with each other, I believe that from a broader perspective, valuable arguments can be found in both and that their contributions can partially converge.

Indeed, the emphasis on participation as a tool in itself originates from the historical routes of development programs that were created by certain specific actors and directed toward / imposed on other actors. Looking at development as a global process, not in the contraposition developing or developed but instead happening everywhere and orchestrated at the local as well as global level, both models partially lose their meaning; participation becomes an implicit part of the communication process, while diffusion of innovations focuses on looking into the communication process in a systematic and planned way.

There is for example the flux of information between academy and the public society, or between governing structures and the subjects they represent, or between centers of technological expertise and common citizens; cases in which receivers democratically choose to be such and expect to be informed about innovations as a service they are entitled to. The shift is thus on control: the receiver changes role from object to subject. On one hand participation becomes an intrinsic premise, while on the other, numerous factors characterizing the diffusion process can be investigated: the modalities in which information is transmitted and by whom, what makes the flow effective and the content understandable.

In this chapter I shall focus on the diffusion of innovation research and in particular those aspects that, in spite of the heavy revision that this field of studies has been through since its first appearance, still are in my view problematic.

### The pro-innovation bias

Diffusion of Innovation (DoI) research is concerned with the manner in which an innovation is adopted and gains acceptance by an individual or other unit of adoption. In line with the modernization paradigm and years of development intervention, change and spread of innovations have been seen in a positive light. Although the pro-innovation bias has been recognized also internally in the diffusion model, I cannot see a substantial change in attitude but more a mitigation of positions.

Extrapolating from the context of development and thinking in terms of anthropology or natural science, it is clear that the reluctance to uncritically embrace any proposed innovation is a natural, biological mechanism, common to other species, which helps to preserve life. A risk-taking attitude is not a universal quality in itself; it

is a natural predisposition that needs to have a certain distribution among the population so to ensure the survival of the species. Thinking in evolutionary terms a risk-taking behavior is what enables an individual to find a new resource. Each tribe (community, pack, group of individuals) can benefit from the presence of a few subjects who are thoughtless enough to be the first to try a new “mushroom” (or sailing path, construction technique, genetically modified crop). Each tribe also needs a majority that does not try new mushrooms just like that; and some individuals that do not adopt even when everybody else does, just in case the negative effect would be delayed. The underlying fact is that innovations are not always a good thing.

In particular, the changes advocated by modernization were not free from negative impacts. Dol has prevalently been used in the past to spread the word of industrialization. For fifty years it has been trying to socially engineer the reluctant Third World toward highly energy-demanding lifestyles; current ecological restraints are now forcing us to focus on the First (and rising) World in the attempt to encourage people back toward sustainable practices. This involves a substantial effort in transferring technical information to the general public to raise awareness about the problem, communicate viable solutions and provoke a debate which would eventually enable political leaders to delineate policies. The subsequent step would be to stimulate citizens to embrace those guidelines. It is likely that viable solutions to ecological problems will imply substantial behavioral changes.

### 2.2.1 From dawn to Rogers’ model

Dol is not easily contained in a well-defined and comprehensive theory. Instead a large number of disciplines, each focusing on a different element of the innovation process, combine to create a meta-theory of diffusion. Since the 1960s, Dol has been applied in various fields of research such as education, public health, communication, marketing, geography, general sociology, and economics. These studies have ranged from the rapid diffusion of the Internet to the non-diffusion of the Dvorak keyboard (in typewriters and computers)<sup>13</sup>.

#### a. Historical timeline overview

- Early 1900’s: Gabriel Tarde, French lawyer, published *The Laws of Imitation* (1903), introducing the original S-shaped diffusion curve.
- 1920’s: British and German-Austrian anthropologists
- 1940’s Ryan and Gross Iowa hybrid seed corn study from the field of rural sociology
- 1960’s: An explosion of diffusion investigations in Latin America, Africa, and Asia began.

#### b. The theory’s construct

The most complete exposition of Dol theory and primary reference in the field is presented in Everett M. Rogers’ book *Diffusion of Innovations*, first published in 1960, and periodically re-edited. Rogers’ intention was to understand the adoption of new behaviors. Having reviewed over 500 empirical studies in the early 1960s, he hypothesized that innovations diffuse over time in stages. Populations were divided into different groups according to their propensity to incorporate innovations and to their timing in actually adopting them. Rogers proposed that early adopters act as models to emulate and generate a climate of acceptance and an appetite for change, and those who are slow to adopt are laggards. As the Argentine author Silvio Waisbord writes, this latter category was assumed to describe the vast majority of the population in the Third World. In accordance with contemporary modernization theories, Rogers considered the subculture of the peasantry an important psychological constraint on the incorporation of innovations, and consequently, of development itself also (Waisbord 2000).

However, diverging from the media-centrism of earlier analyses, he concluded that the media had a great importance in increasing awareness but that interpersonal communication and personal sources were crucial in making decisions to adopt innovations. The effectiveness of field workers in transmitting information in agricultural development projects also suggested the importance of interpersonal networks in disseminating innovations. Consequently, a triadic model of communication was recommended that included change agents, beneficiaries, and communicators (Waisbord 2000).

Another important finding of diffusion research, as showed by the farmers’ studies, was that change is not motivated by economics but mainly by communication and culture. Such studies were particularly influential

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<sup>13</sup> The Dvorak keyboard configuration is superior and allows for more efficient and faster typing. However, since most typists learned to type using the QWERTY configuration and are comfortable with that configuration, there is great reluctance to adopt the Dvorak, despite its superiority. This is a classic example of how human, interpersonal, and social factors often play a more significant role in adoption than technological superiority.

because a substantial amount of early efforts targeted agricultural development in the Third World (Waisbord 2000).

### c. Critical assessment

In the mid-1970s, as attitudes toward modernity began to change, some basic premises of diffusion research were also questioned. In a widely quoted article, Rogers admitted “the passing of the dominant paradigm” (Rogers 1976). In later versions of his book he analyzed the individualistic and psychological biases of DoI early positions and claimed the necessity in the communication process to introduce sensitivity to specific socio-cultural environments and to modify the top-down diffusion vision.

Development was then theorized as a participatory process of social change intended to bring social and material advancement. Communication was no longer focused on persuasion, but was understood as a “process by which participants create and share information with one another in order to reach a mutual understanding” (Rogers 2003).

However, traditional studies in this field are often subjected to cultural relativism; judgments are subjective and value-laden. “DoI theory is at its best as a descriptive tool, less strong in its explanatory power, and less useful still in predicting outcomes, and providing guidance as to how to accelerate the rate of adoption. There is doubt about the extent to which it can give rise to readily refutable hypotheses. Many of its elements may be specific to the culture in which it was derived (viz. North America in the 1950s and 60s), and hence less relevant in, for example, East Asian and African countries, and as time goes on” (Clarke 1999).

### d. Elements of DoI

According to Rogers, diffusion is the process by which an *innovation* is *communicated* through certain *channels* over *time* among the members of a *social system*. The main elements of the theory are thus the innovation itself, the communication channels, the time frame of diffusion, and the nature of the social system into which the innovation is being introduced.

## 2.2.2 The Innovation

An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. A number of factors interact to influence the diffusion of an innovation. Its characteristics, as perceived by the members of the social system, determine its rate of adoption. Innovations that are perceived by individuals as having greater *relative advantage* (the degree to which it is perceived to be better than what it supersedes), *compatibility* (consistency with existing values, practices, past experiences and needs), *trialability* (the degree to which it can be experimented with on a limited basis before adoption), *observability* (the visibility of its results), and less *complexity* (difficulty of understanding and use) will be adopted more rapidly than other innovations. (p12 Roger 1995)

Intrinsic elements of innovations are its *form* (the directly observable physical appearance and substance), *function* (the contribution made by the innovation to the way of life of the adopter) and *meaning* (the subjective and frequently subconscious perception of the innovation). (p451 Rogers 2003)

A factor that was ignored or negatively valued in earlier days but successively gained credit is re-invention (the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation). The new idea changes and evolves during the diffusion process as it moves from adopter to adopter. It was found that a higher degree of re-invention leads to a faster rate of adoption (more flexible, can be fit to a higher range of adopters' conditions) and higher degree of sustainability (continues to be used over time after a diffusion program ends). I believe that this result arguably speaks in favor of bottom-up or decentralized diffusion of innovations strategies (see below) since re-invention means a high level of participation and control over the innovation. In this sense innovators (see below) can be seen as empowered adopters.

Preventive innovation, i.e. a new idea that an individual adopts now in order to lower the probability of some unwanted future event (HIV/AIDS) or to gain a long-term advantage (planting trees), differs from other kind of innovations in that its diffusion is lower and slower; this occurs partially because the reward is delayed or because the reward is a non-event; in both cases the gain is more difficult to recognize.

### 2.2.3 Communication Channels

Communication is the process by which participants create and share information with one another in order to reach a mutual understanding. A communication channel is the means by which messages get from one individual to another.

Dol studies showed that people rely most on the opinions of members of their social networks rather than solely or mainly on the mass media. Mass media channels play a bigger role at the knowledge stage; their most powerful effect on diffusion is that they spread knowledge of innovations to a large audience rapidly. But interpersonal relations are crucial in channeling and shaping opinions. Different subjects can play a role in the diffusion process, *opinion leaders* (who have relatively frequent informal influence over the behavior of others); *change agents* (who positively influence innovation decisions, by mediating between the change agency and the relevant social system); *change aides* (who complement the change agent, by having more intensive contact with clients, and who have less competence credibility but more safety or trustworthiness credibility).

#### a. Change agents

It has been noticed that socioeconomic elites are better reached by change agents. This seems to be due to better communication based on the higher degree of homophily between the two groups (more similar cultural-socio-economic characteristics) and, according to the *least resistance criterion*, more favorable feedback since they are most receptive toward innovation.

In my eyes, the initial propensity toward a pro-innovation bias, a top-down approach and a market-inspired approach can still be found in Rogers's definition of a change agent and its functions: "change agents should be aware of their clients' felt needs and adapt their change programs to them. They should not, however, relinquish their role in shaping these needs" (p375 Rogers 2003) and again "[A change agent's role is] to develop a need for change [...] to assess clients' needs [...] and also may help to create needs" (p369 Rogers 2003)

I think that shaping needs or even creating needs implies a privileged position held by the change agent in knowing what people should need, also implying that the proposed innovation surely is fitting the targeted audience system. According to this view, change programs are still created outside the community and possible adopters are not citizens but clients.

#### b. Diffusion systems (centralized and decentralized)

Diffusion campaigns can be differentiated according to the degree of participation of the members of a diffusion system in the diffusion of an innovation. Early programs were characterized by a more top-down approach while client-controlled strategies acquired more popularity with time. Rogers recognizes the importance of decentralized systems but still proposes some restraints.

"A fundamental assumption of decentralized diffusion systems is that members of the user system have the ability to make sound decisions about how the diffusion process should be managed. This capacity of the users to manage their own diffusion system is greatest when 1) the users are highly educated and technically competent practitioners, so that all users are experts, or 2) the innovation being diffused do not involve a sophisticated level of technology, so that intelligent laymen have sufficient technical expertise to take advantage of them" (p398 Rogers 2003).

As I see it, one thing is deciding upon an innovation, and another is to understand technical aspects. People buying a computer generally do not need to understand all the details about how the machine functions. Normally, political elites rely on the advice of external bodies to gain the technical information the need to take decisions. Technical expertise is often less important than good understanding of community needs.

Rogers advances the concept of hybrid systems. I agree that this would in fact be a good combination for many issues that do not interest just the local community but have broader implications (like forest management); programs could be grounded in the use of centralized policies indicating the guiding lines toward what has to be achieved and implementation strategies elaborated at the local level.

#### c. Communication networks

A communication network consists of interconnected individual who are linked by patterned flows of information. The network interconnectedness of an individual in a social system is positively related to the individual innovativeness. *Interlocking* personal networks (each interact with others), other than *radial* (each connect to a focal individual) are more open and hence play a more important role in diffusion of innovations. Homophilous

and eterophilous contacts convey information in different manners. Homophily enhances the transfer of information since people with similar background understand each other in an easier way. Eterophilous links are weaker but can work as bridges allowing information to pass through social systems. "Homophily can act as an invisible barrier to the rapid flow of innovations within a social system, as similar people interact in socially horizontal patterns, thus preventing a new idea from trickling down from those of higher socioeconomic status, more education, and greater technical expertise" (p362 Rogers 2003). I argue that this conclusion is derived from the assumption that propensity toward innovation is related with socioeconomic status, education and technical expertise, while, if we recognize a genetic component (see more about this below) of innovativeness, it is logical to assume that its diffusion is homogeneous among different social classes and cultural background. If cleaned from the social class analysis, the concept of homophily as a barrier to diffusion can still be valid as "genetic innovators" would preferentially mingle with their kind and the same would happen to more traditional individuals. It is therefore useful to recognize the importance of what Rogers calls *audience segmentation* so that different communication channels or messages are used to reach each homophilous sub-audience.

## 2.2.4 Time frame

Rogers analyses the time dimension from different perspectives. One is the sequence of psychological steps leading to the adoption or rejection of the innovation, another is the classification of adopters according to their personal promptness in adopting, and the third is the rate at which the innovation spreads.

### a. Decision Process - Stages of Adoption

The innovation-decision is made through a cost-benefit analysis where the major obstacle is uncertainty. People will adopt an innovation if they believe that it will, all things considered, enhance their utility. An individual (or other decision-making unit) undertaking a decision process goes through successive stages: *knowledge* (exposure to the innovation's existence, and understanding of its functions); *persuasion* (the forming of a favorable attitude to it); *decision* (commitment to its adoption); *implementation* (putting it to use); *confirmation* (reinforcement based on positive outcomes from it or rejection).

### b. Adopter categories classification in terms of innovativeness

Each individual's innovation-decision is largely framed by personal characteristics. Individuals who are predisposed to being innovative will adopt an innovation earlier than those who are less predisposed. Adopters are classified in five categories:

- *Innovators*: venturesome, cosmopolitan, risk-taking, information-seeking, with a higher financial status. Innovators do not just receive the innovation but often contribute to its development.
- *Early Adopters*: greatest degree of opinion leadership, respected by other members of social group.
- *Early Majority*: deliberate, adopt new ideas just before the average member of a system.
- *Late Majority*: skeptical, adopt new ideas just after the average member of a system. The pressure of peers is necessary to motivate adoption.
- *Laggards*: traditional, last in a social system to adopt an innovation; pays little attention to the opinions of others.

The individual innovation-decision process also depends heavily on the innovation-decisions of the other members of the system. Innovators enjoy being on the cutting edge, the fact of being the first ones to try is probably a reward in itself. Early adopters use the data provided by the innovators' implementation and confirmation of the innovation to make their own adoption decisions. Much of the social system does not have the inclination or capability to follow the most recent information about innovations, so they instead trust the decisions made by opinion leaders. Additionally, much of the social system merely wants to stay in step with the rest. Since opinion-leader adoption is a good indicator that an innovation is going to be adopted by many others, these conformity-loving members are encouraged to adopt. As implementation of the innovation-decisions of earlier adopters results in social and/or economic benefits, adoption becomes a necessity and the rate of adoption rapidly increases. The last adopters, laggards, can either be very traditional or be isolated in their social system. If they are traditional, they are suspicious of innovations and often interact with others who also have traditional values. If they are isolates, their lack of social interaction decreases their awareness of an innovation's demonstrated benefits.

### c. Rate of Adoption S-shaped curve

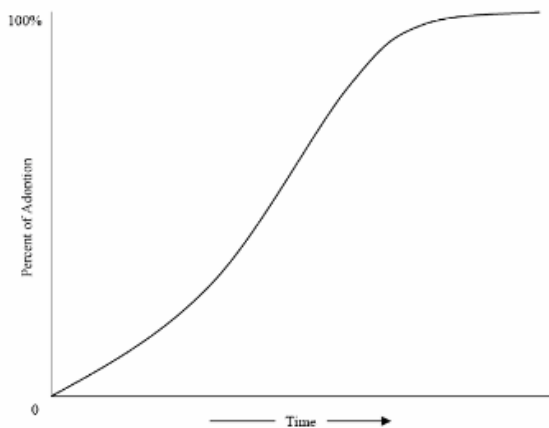


Figure 13 Rate of adoption of an innovation

The rate of adoption is the relative speed with which an innovation is adopted by members of a social system and it is measured as the number of members of the system that adopt the innovation in a given time period. It is influenced by the attributes of the innovation, by the type of innovation decision (optional, collective, authority), the nature of the communication channels, the social system, and the change agents' promotion effort. The diffusion phenomenon follows an S-shaped curve, shown in Figure 13.

The new idea typically moves slowly through a societal group as it is first introduced. Then, as the number of adopters increases, so does its diffusion.

The flex point indicates the moment when a critical mass of adopters is reached, i.e. when enough individuals have adopted and its further spreading is self-sustained

The derivative of the S-shape curve gives a standard bell-shaped distribution curve (Figure 14). Diffusion researchers divided it into 5 regions defined by average  $\bar{x}$  and standard deviation  $\sigma$  to characterize the five categories of system members' innovativeness. On one extreme of the distribution are the innovators while on the other extreme are laggards.

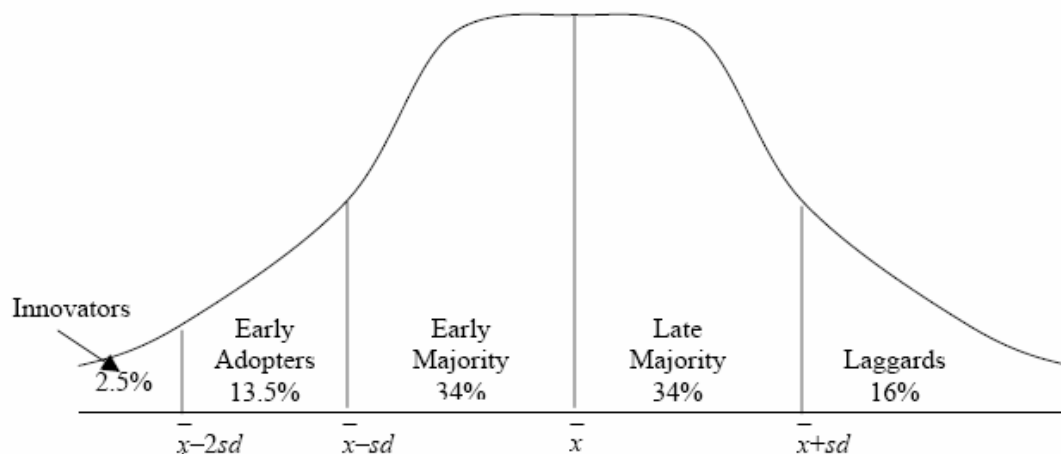


Figure 14 Categorization of five groups of adopters on the basis of innovativeness

### d. Factors that positively correlate with innovativeness<sup>14</sup>

Rogers puts a special effort in the attempt to classify early-adopting behavior in terms of social-economic characteristics, personality and the use of communication channels. From statistical data it was found that concerning socio-economic factors, early adopters tend not to be different in age, but to have more years of education, higher social status, upward social mobility and be in larger organizations. Considering personality factors, early adopters have greater empathy, less dogmatism, a greater ability to deal with abstractions, greater rationality, greater intelligence, are favorable toward change and science, a greater ability to cope with uncertainty and risk, less fatalism and higher aspirations (p289 Rogers 2003). Finally communication for early adopters is characterized by more social participation, more interpersonal networks, higher cosmopolitanism,

<sup>14</sup> Innovativeness is here intended as predisposition to accept innovations

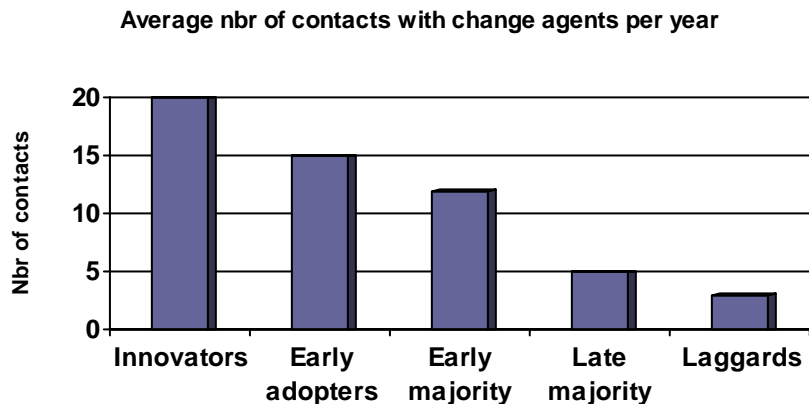
more contact with change agents, greater exposure to mass media channels, more interpersonal communication, more active information-seeking, have greater knowledge of innovation and more opinion leadership.

I think that this meticulous categorization based on the use of surveys and statistical analysis of data holds some conceptual faults and it probably is the weakest part of Rogers' theory.

In the first place, the very choice of the factors that are measured reflects a *pro-innovation bias* in that all qualities characterizing early adopters are positive and generally shared by the change agents themselves. Innovativeness may correlate with negative characteristics like: recklessness, hastiness, inconsiderateness, lack of thoughtful judgment, self-centeredness, greediness and so forth, but nobody bothered to check, although this information might also be of use, for example to marketing campaigns.

Moreover, the selection of variables such as formal education, size of operation, income, cosmopolitanism, and mass media exposure, carry, as Rogers also recognizes, an *individual blame*. "The variables used in diffusion models [to predict innovativeness], then, are conceptualized so as to indicate the success or failure of the individual within the system rather than as indicators of success or failure of the system" (p120 Havens, 1975 in Rogers 2003). "Seldom it is implied in diffusion research that the source or the channel of innovations might be at fault for not providing more adequate information, for promoting inappropriate innovations, or for failing to contact less educated members of the audience who might specially need a change agent's help" (p121, Rogers 2003)

In addition, factors, like education, social status, etc reflect the homophily between change agents and their early adopters: similar people better understand each other (according to Rogers' list, greater empathy is one of the early adopters' characteristics, not surprisingly), so that communication and persuasion are easier. This is confirmed by the fact that the use of change aids improves diffusion results. In the following table (p382 Rogers 2003) it is shown how higher frequentation between change agents and clients increases the rate of adoption.



Change agents invest much energy on innovators and early adopters whose socio-economic-cultural characteristics, as described in diffusion research, closely mirror the change agents themselves. Rogers is even meticulously reporting the characteristics of early vs. late *knowers* of innovations; and once again "early knowers of innovation, when compared to later knowers are characterized by more formal education, higher social status, greater exposure to interpersonal channels of communication, greater agent contact, greater social participation, greater cosmopolitanism" (p217 Rogers 2003). But knowledge is at a very initial stage of the adoption process. If the argumentation that social status and education might facilitate adoption is discussable, to infer the same for knowledge is an even more hazardous step. Doesn't this data say more about the failure of information campaigns to reach a specific sector of the population?

Another point I consider critical, concerns the way statistical tools are used. For example it is assumed that the listed characteristics like age and economical situation are independent factors, but this might not be the case. One would expect innovativeness to be closely connected to age. However, this fact does not appear from the studies. Indeed it is a quite intuitive fact that younger mammals are more curious, learn faster and are more open to accept new things. Internet, Ipod, videogames and other new technologies are embraced by teenagers

with greater enthusiasm than they are by older people. All important breakthrough discoveries were made by their authors in their youth.

So, why isn't this pattern shown in DoI studies? Why aren't young farmers adopting more easily than old ones? It is difficult to speculate without directly analyzing the data, but one hypothesis is that young farmers lacked the means to adopt. In the words of Rogers: "although agricultural innovators tend to be wealthy, there are many rich farmers who are not innovators" (p289 Rogers 2003). How would the charts look like if the number of adopters distributed by age would be normalized over the variable of wealth? In other words, considering farmers with same or comparable wealth, who are more inclined to adopt, the older ones or the younger ones? The discussion about age just helps to illustrate how other characteristics can also have suffered from a deficient interpretation of data.

There are attributes that suspiciously correlate in these studies but that we know are quite independent otherwise. An easy argumentation is for example the intelligence factor. Leaving purposely aside discussions about the definition of intelligence (not because it is not pertinent but because it is not needed here) it can be said that intelligence has little to do with innovativeness. Consider the international measure system SI. It is used to facilitate communications among scientists and presents unquestionable advantages; for example the unit of measure for length is the meter (not the inch, not the feet, not the yard, not the mile; just the meter) so that one can directly compare results from different studies without the need to convert all units of measure back and forth. Nevertheless, still today there are scientists publishing papers where quantities are expressed in units that do not belong to the SI system, going in this way against the international agreement. In this case, the social environment is made of highly educated people (PhDs, professors, researchers, in one word the academy), high social status and intelligent<sup>15</sup> (assuming commonly used definition). Still, many of them are conservative in attitude when it comes to units of measurement. Is it so that early adopters are definitely intelligent but intelligent people do not need to be adopters? I doubt it.

A further point is that of causality, a critique raised toward DoI research and acknowledged by Rogers in recent editions.

"Such factors [as wealth, size, cosmopolitanism, etc.] may be causes of innovations, or effects of innovativeness, or they may be involved with innovation in cycles of reciprocal causality through time, or both they and the adoption of new ideas may be caused by an outside factor not considered in a given study" (p20 Mohr, 1966).

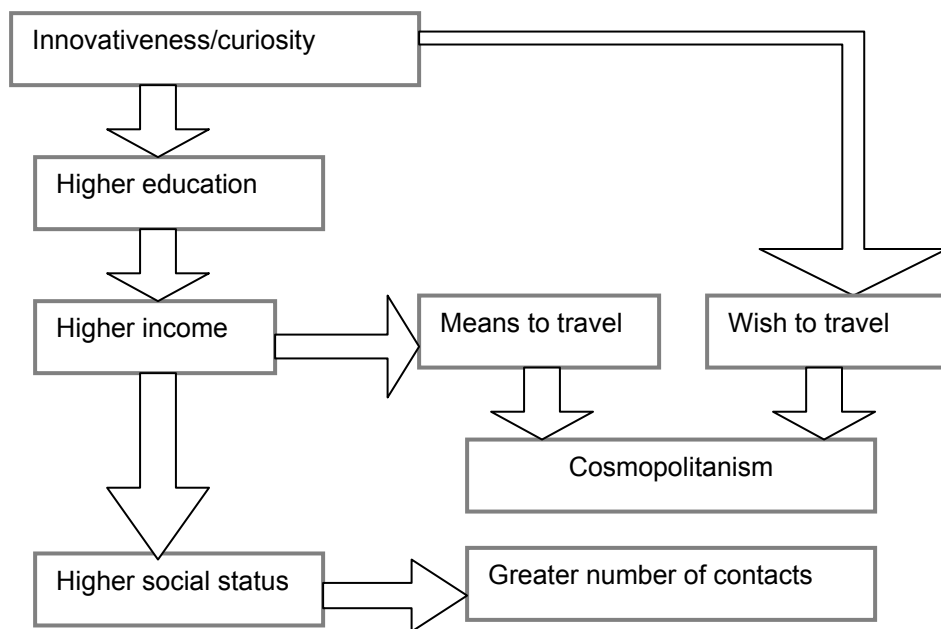


Figure 15 Causality diagram

<sup>15</sup> Paradoxically, this category includes the very change agents of Iowa programs

I advance the hypothesis that the personal trait of being favorable toward an innovation has a genetic component (see Appendix 0). What would the consequences of this assumption be concerning early adopter personality characteristics? From recognizing a genetic component it follows that the individual propensity to adopt must be spread across the population with its own natural distribution, as with other inheritance-related characteristics, and does not need to be related with specific cultural factors like education.

We should therefore expect “innovative people” to be equally present in every social milieu and country. In fact the study, reported by Rogers (p255 Rogers 2003), of Amish community members supports this assumption: scarcely educated, highly dogmatic but eager to adopt when innovations were consistent with their cultural values.

On average in western environments, in particular those analyzed by Rogers and the Iowa scholars, the genetic predisposition toward innovations can lead to an interrelated chain of consequences which might explain their findings. For example, innovativeness can relate to curiosity and curiosity can be the cause of a higher education level given the proper environment (possibility to go to school if so wished) and so forth as showed in the following diagram. But this might not be the case in other situations. The independent variable is genetic predisposition while all other characteristics are expected consequences in environments where the conditions are favorable.

This point would have special importance when applying diffusion techniques to different environments and when manufacturing ad hoc strategies, programs and campaigns. It is thus important to understand what the real characteristics of adopters are, so to eliminate side causes like economical or social factors. In surveys it would have been important to ask why did people adopt/did not adopt and not just when and how.

“The individuals or other units in a system who most need the benefits of a new idea (the less educated, less wealthy, and the like) are generally the last to adopt an innovation. The units in a system who adopt first generally least need the benefits of the innovation. This paradoxical relationship between innovativeness and need for benefits of an innovation tends to widen socioeconomic gaps between the higher and lower socioeconomic individuals in a system” (p295 Rogers 2003).

To illustrate with a simplified example, let’s take large, poor cities’ slum areas. Assuming genetic standard distribution of innovativeness (whatever that would prove to be) we expect to find a share equal to that of any other group, of illiterate poor people that are nevertheless naturally curious, interested in new things; that are respected by their community maybe for some skills that have nothing to do with reading books and understanding change agents’ material. These people can be potential early adopters if contacted with proper means but diffusion programs that are not suited can easily fail to reach them. From a participation model perspective one would say that the campaign fails to involve that part of the population.

## **2.2.5 The Social System**

A social system is defined as a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal. The members or units of a social system may be individuals, informal groups, organizations, and/or subsystems. The social system constitutes a boundary within which an innovation diffuses. The system's social structure and the norms (established behavior patterns for the members of a social system) that characterize it affect diffusion. There are different ways in which the decision about adopting an innovation is taken: it may be optional (where the person or organization has a real opportunity to adopt or reject the idea), collective (where a decision is reached by consensus among the members of a system), or authority-based (where a decision is imposed by another person or organization that possesses requisite power, status or technical expertise).

### **a. Consequences of innovations**

A particularly important aspect of DoI, that gained attention in later studies, is the consequences of innovations (for example in terms of: employment/unemployment, migration of rural people toward already crowded cities, more equitable distribution of individual incomes). One problem is that consequences are difficult to study with conventional types of research approach since in-depth and over-time observations are required rather than simple surveys. The classification of unanticipated consequences relies on an investigator’s ability to determine the original objectives for introducing an innovation in a system. Rogers suggests that a change agent can preview an innovation form and function but not its meaning.

“Change agents frequently do not sense or understand the social meaning of the innovation that they introduce, especially the negative consequences that accrue when an apparently desirable innovation is used under

different conditions. Change agents are especially likely to make this mistake if they do not empathize with the innovation's users, which is particularly likely when the change agents are heterophilous with their clients." (p451 Rogers 2003) It can be added that seldom can the vast consequences of the introduction of an innovation be foreseen, not just by change agents but by anyone. Communities are complex systems whose behavior cannot be easily understood or modeled. Often social systems developed during a long period toward some equilibrium status and the sudden introduction of an innovation can disrupt such equilibrium. Rogers believes that in these cases the rate of change is too fast to permit a social system to adjust, and proposes the concept of *dynamic equilibrium*, which occurs when the rate of change in a social system is commensurate with the system's ability to cope with it.

Yet another negative consequence is that the diffusion of innovations often widens the socioeconomic gap between the higher and the lower socioeconomic status segments in a system. This happens because richer people can afford to adopt, they are the change agents' preferential contacts and they can enjoy windfall profits before the innovation becomes widespread. Strategies to narrow the gaps between *ups* and *downs* target two salient points: access to information (creation of redundant and tailored messages to target lower socioeconomic audiences according to their formal education, beliefs, communication habits; change agents focus on the downs) and greater resources to adopt (design through R&D of innovations that are appropriate for downs and financial support for certain high-cost innovations).

## 2.2.6 Diffusion of innovations revisited

During the past fifty years DoI has undergone important revision; in this process it has acquired some features proper to the participation model. Diffusion of innovation is now defined not as a mere method but a process, adopters are active participants, and the aim is not persuasion but the achievement of mutual understanding. Nevertheless, I feel that DoI still limits its focus to a reduced part of the transfer of information process leaving some areas uncovered. DoI enters the picture at a fairly advanced stage, when the innovation already exists and information about it has to be diffused. However, innovation should be the response to a request. This implies that there is an important phase to study which analyses the process in the inverse direction, that of gathering the necessary information about the needs of the clients in order to develop a suitable innovation. The direction of the information flow here is from society to experts. The natural successive stage would be that of evaluation of the innovation. Does the innovation match the requirements? What positive and negative consequences would it entail? What kind of social impact? Would the social equilibrium be challenged? This would be a feedback process, i.e. double-folded, from experts to society and back. Classical DoI is currently interested just in the last step, from experts to society. At this point, the goal is to design strategies, communication campaigns, economical incentives and regulations to diffuse the innovation among all citizens. This last part is also important but it is just one component of the entire process.

In other words, the concern of DoI is currently just looking at the implementation stage while I would suggest the involvement of DoI in a much earlier phase, i.e. during the creation and evaluation of the innovation.

With this approach, adopters are not judged for rejection, but the innovation is. The innovation is under scrutiny and the flux of information does not have preferential directions. Spreading of ideas is not meant for the ideas to be absorbed but to be questioned, rejected or improved. Ideas are not laid upon the world from above but thrown into the global arena to undergo a process of readjustment to fit different realities, to be interpreted. The benefit is not merely directed to the target but goes back to the source. Spreading of information means that knowledge is shared, but in the very process knowledge is also augmented since providing access to knowledge means at the same time gaining access to feedback. Feedback is likely to provide new hints, improved solutions and better localized implementations.

## 3 Field study

### 3.1 Methodology

#### 3.1.1 Analytical framework

I intend to analyze the communication strategy of AMURT's reforestation program both in general terms and specifically investigating, and in some cases challenging, some of the findings of the DoI field. In particular I believe that the influence of several attributes in the characterization of early adopters, like socioeconomic status, age and gender has been misplaced (see section 2.2.4d). Another aspect that I would like to reflect upon is the possible unanticipated consequences for the social system caused by the introduction of this particular innovation (see section 2.2.5).

##### a. Early adopters' characteristics

Rogers divides the adopters of an innovation into five different categories according to their promptness in acquiring it (see section 2.2.4 b). He further characterizes the individuals belonging to these groups with specific traits in terms of socioeconomic status, communication behavior and personality. Innovative people are, according to this classification, more educated, richer, cosmopolitan, empathetic and even more intelligent. This puzzled me, since I believe that the predisposition toward innovations has a genetic component and should therefore be distributed among the population in a uniform way regardless of whether the person for example has had the possibility to study or not. Moreover there is no evidence in scientific publications that risk-taking people should also be more intelligent etc. And there are additional issues with the reasoning.

Socioeconomic status. This variable may not be as predictive as in DoI theory if genetic factors play a significant role. Some people are born curious while others are more conservative. Both kinds are necessary for the survival of societies, since on one side not all innovations are good, and on the other, new paths can lead to useful solutions. It is therefore a wise evolutionary strategy to have some individuals that face risks and try innovations out while the others keep their position of security, waiting-and-seeing how it goes. This is my hypothesis based on intuition and some scientific clues (see Appendix, paragraphs 0, 0). If this is true, one can expect "open" people to be equally spread among the population (according to some empirical distribution curve that should more or less be the same for all human groups) and not necessarily belonging to higher socio-economic classes. While more open and curious persons growing up and living in nourishing environments might develop higher socioeconomic status, the contrary is not true. I expect to find the same percentage of "open" individuals among analphabets born in the slums as among people born in rich areas.

The influence of age and gender. Age should also play a role. Intuitively I would argue that youngsters have a much easier time to accept new situations (see Appendix, paragraph 0); try new food, drugs, and generally experiment with their life. People normally become more conservative with age, and feel increasingly threatened by changes of any kind. Young males have higher records of risk-taking behaviors (reflected in more expensive car insurance premiums for example). I therefore advance the hypothesis that age should positively correlate with innovativeness and if it does not, the causes might be sought after in other factors, such as for example economical limitations. Moreover, I am not aware of studies that focus on the gender perspective, although intuitively, gender and the combination of gender and age should show some influence on the eagerness to adopt. I believe that it would be important to achieve a correct understanding of the factors that affect innovativeness. This would give the possibility to supplement programs with specific audience segmentation strategies in order to increase their success. There might be early adopters out there that would be eager to adopt but do not only because they are not properly targeted by the diffusion campaign, or because they do not have the means for doing so.

##### b. Consequences of the introduction of innovations

What kind of consequences can we expect from the introduction of an innovation especially in the long run? This is an especially critical question to answer. Due to the complexity of human systems, the expected results

are not always matched by the real consequences that follow the introduction of an innovation. Unanticipated negative consequences cannot by definition be predicted a priori and especially so when the outcomes are delayed in time; this also implies that the study of unanticipated consequences involves long time scales. However, although each project has a different impact on the reality upon which it acts, there are some patterns that are recurrent in different projects and that can therefore be considered with special attention prior to new implementations.

For example a typical unwanted effect is that of increasing the relative social gap among categories of adopters (see section 2.2.5). Higher socioeconomic sectors of the population, “ups”, adopt earlier than “downs” so that they are able to benefit from the advantages of the introduced innovation before and better than the others (they are the first to occupy a new niche).

Being aware of this phenomenon means to have the chance to avoid it by employing ad hoc strategies. For example, three factors have been identified that reside in the economical gap broadening: ups have greater access to information, greater access to innovation evaluation from their peers, and possess greater resources to adopt. Possible strategies for narrowing gaps could then be:

### **Information**

- Redundant messages to target lower socioeconomic audiences, tailored according to formal education, belief, communication habits
- Group work to create a feeling of self-efficacy and control (enabling people to get closer to the situation of innovators). Stimulate re-invention.
- Direct contact of change agents to late majority and laggards
- Peer evaluation
- Opinion leaders among the disadvantaged individuals in a system should be identified and change agents' contacts should be concentrated on them, in order to activate their peer networks and influencing
- Change agents' aides should be used

### **Resources**

- Appropriate innovations for “downs” should be recommended. Targeted R&D.
- Provide social organization to support “downs” with economical resources for certain high-cost innovations. Micro-credit, ethical finance.
- Focus of programs and diffusion agencies only to the benefit of “downs”.

Are these measures taken by AMURT? Are there signs of possible sources of unbalance in AMURT's practice?

## **3.1.2 Research tools**

The ambition of this study is to offer a starting point for reflection on the issue of reforestation in Haiti through the study of one program operated by one particular organization in one chosen area. Given the specificity of the circumstances I cannot claim to have gained an exhaustive picture of the situation through my investigation.

On the other hand, even if the data I gathered are not representative of the whole Haitian reforestation reality, I believe that they do provide valuable indications. When I approached the subject I did not have clear ideas about what I was looking for, so I proceeded in a tentative way. In this phase, a more extensive research involving the accumulation of quantitative data would not have helped me to form an opinion. As Servaes states, “through the myopic glasses of rigid theories and constructs, other aspects that may be even more important are typically not noted because they are not looked for. [...] In other words, the researcher immerses her- or himself in the context not to verify hypotheses, but as sources for understanding meaning” (p105 Servaes 1999).

I may use a metaphor to clarify the difference between the explorative method I used and a routinely systematic search. Let us depict information as a spirit hiding in the forest and research as the way to find it. If we would know that the spirit always takes the form of a rabbit, we could organize a thorough search, encircle the wood and proceed closing the ring toward the center. It would be easy to routinely check each rabbits' tunnel (or a representative sample of them), we would not need a deeper understanding, and sooner or later the spirit would be caught. But if the phenomenon we are looking at is more complex, if the spirit can assume any form, a rabbit, a bird, maybe even a tree, then it might be wiser to follow its track step by step, evaluating

every hint and let subjective intuition contribute in devising a path, keeping an open mind to catch possible signs because we would not know exactly what to look for. On the other hand once the spirit is found and we are sure of its identity, it is of no use to scour the rest of the forest to demonstrate that the spirit is not hiding somewhere else. This parallel is to say that the use of quantitative data, i.e. the systematic search of each tunnel, is not always the best tool to gain knowledge.

Questioning the myth that only quantitative data can assure scientific validity of results, Norwegian psychologist Steinar Kvale states that “qualitative and quantitative methods are tools, and their utility depends on their power to bear upon the research questions asked” (p69 Kvale 1996).

It is my opinion that the instruments I used in this case, of a more inquiring nature, such as participant observation and semi-structured qualitative interviews, gave a better picture of the problem as I formulated it, since their agility offers the possibility to reach a deeper understanding of the matter.

Regarding the validity of results, it does not need to be ensured by statistics but can instead be supported by means of an analytical process.

“Validation comes to depend on the quality of craftsmanship during investigation, continually checking, questioning, and theoretically interpreting the findings” (p241 Kvale 1996).

It is therefore especially important to pursue knowledge from different sides by means of triangulation. Kvale defines this process as “the comparison of data relating to the same phenomenon but deriving from different phases of the fieldwork, different points in the temporal cycles occurring in the setting, or, as in the respondent validation, the accounts of different participants in the setting” (p244 Kvale 1996). Following this strategy, I tried to diversify my sources:

- Time frame. I visited Haiti two times for a total period of three months, two months the first time from October to December 2005 and another month in April/May 2006. The idea was to monitor the reforestation program in different phases of its implementation.
- Documentation. As a start, I acquainted myself with Haitian culture (from literature to painting and music) and history by reading a few books and searching for further information on the Internet.
- Observation. Once I was in Haiti I immersed myself in the local atmosphere as much as I could. I lived with the NGO (see below) in strict contact with the local population involved in the reforestation program and assisted in the interaction between the two. I assisted in education campaigns, both seminars for teachers and lectures for elementary school students.
- Focused observations. I had the opportunity to participate in a seminar organized for the teachers of local schools in which one of the presented themes was reforestation. Subsequently I followed one of the agronomists in a tour visit to two rural schools, and watched his lessons about the environment. During my second visit I actively worked in a new campaign, which I also promoted: this campaign focused on solar energy and radio broadcasting (the link between the two is that one needs a radio apparatus as well as the possibility to energize it in order to be able to listen to radio transmissions). A meaningful moment was the introduction of mini-solar-panels technology to the public. We had demonstrations at the weekly market, some bars and at local committees.
- Interviews. I acquired more specific information about the program in an early stage of my visit by interviewing representatives of AMURT, the project coordinator, two agronomists, one village committee member and another exponent of the local leadership. During the second visit, I tested some of my findings in a short interview with a sociologist from the University of Quisqueya in Port au Prince.
- Semi-surveys. The bulk of data intended supposed to constitute the central part of my work as it was designed were collected with semi-structured interviews. Having as a base a questionnaire, but leaving great space for improvisation, I interviewed different groups of farmers. The situations, villages and the accompanying assistant were different for each case. Finally, I took a third sample during my second visit, in a village where AMURT had not yet reached.

However, my own structuring of the search for and analysis of evidence does not need to be acritically accepted by others. On the contrary, I believe that the conception of objective and unique reality unquestionably shared, the rabbit quietly waiting to be found, might lead to a simplification of meanings. Competing perspectives are not just a possibility but a better way to acknowledge the complexity of living systems. In other words, the spirit can assume different shapes to different observers and its nature cannot be simply uncovered but has to be constructed through dialogues.

“The quest for absolute, certain knowledge is replaced by a conception of defensible knowledge claims. Validation becomes the issue of choosing among competing and falsifiable interpretations, of examining and providing arguments for the relative credibility of alternative knowledge claims” (p240 Kvale 1996)

Therefore, even if the path chosen for the search is subjective and not quantitative, the accurate description of the search details provides the reader with the instruments to evaluate on his/her own. In other words, the use of methodological transparency can enable an independent evaluation: “by specifying the supporting evidence and making the arguments explicit, the researcher can allow readers to judge the soundness of the generalization claims” (p233 Kvale 1996).

I shall thus describe in some detail my fieldwork experience in this research process.

### 3.1.3 Participant observation

Participant observation has been a fundamental part of my quest. Firstly, “knowledge of a phenomenon is required to be able to pose significant questions” (p96 Kvale 1996).

When I arrived in Haiti I did not have any first-hand knowledge of the local culture or about the hosting NGO. Before traveling I read some texts to acquaint myself but I did not feel that my knowledge was enough. I thus thought that Kvale’s suggestion to spy on the field for fieldwork research would have been useful.

“Familiarity with the context of an investigation is not obtained only through literature and theoretical studies. Just hanging out in the environment where the interviews are to be conducted will give an introduction to the local language, the daily routines, and the power structures, and so provide a sense of what the interviewees will be talking about. Particularly for anthropological studies a familiarity with the foreign culture is required for posing questions” (p96 Kvale 1996).

As record-keeping tools, although I did not keep a systematic record of the social situation under study, I took note of some episodes that struck my imagination; I took plenty of pictures and also filmed brief sequences.

According to American anthropologist James Spradley, the participant observer has the dual purpose of engaging in activities appropriate to the situation and to observe the activities, people, and physical aspects of the situation. Differently from an ordinary participant, the participant observer has to be explicitly aware while observing. The experience is of being simultaneously insider and outsider. The outsider side of the observer introspectively uses the insider side as a research instrument.

In this study I had a double target to examine: on one side the hosting NGO, in its turn made up of foreign volunteers and Haitian employees and on the other, the local population involved in the organization’s programs. My level of participation has been different in the two cases. I would define my interaction with the NGO as active while that with the local population as moderate. Following Spradley’s categorization, “the active participant seeks to do what other people are doing, not merely to gain acceptance but to more fully learn the cultural rules for behavior. [...] Active participation begins with observation, but as knowledge of what others do grows, the ethnographer tries to learn the same behavior. He observes others and learns from them, but he learns by observing himself as well.” (p60 Spradley 1980)

**Living with AMURT.** Living and working with the members of the NGO AMURT, I participated in their activities and projects, from writing proposals, visiting sponsors and helping with whatever had to be done.

I would not consider my participation as complete since while I share and appreciate much of the practical principles that characterize AMURT’s philosophy and their approach to development and I was initiated to meditation (I still practice although not regularly), I did not see myself as a *margii*. As an atheist, it is difficult for me to embrace any kind of religious credo and if I often felt sympathy for their choices or at least respected them, I was not motivated by the same beliefs. Hence, my role in the organization has been that of a technical external consultant. This has given me the opportunity to reflect upon the happenings from the inside but holding a certain distance. The group of people working in Haiti is constituted of two spiritual guides (Dada, of African origins and Didi, from the Canary Islands), a few volunteers both from the US and Haitians, whose number varies according to availability, other occasional “technical” volunteers (like me) and several Haitian employees.

My personal experience among the *margiis* has been very pleasant regardless of the constraints in terms of comfort. I’ll briefly portray the living conditions. Diet excludes: meat, fish, eggs, onion, garlic, mushrooms, caffeine as well as any kind of stimulant (this rules out tea, soft drinks, candies, chocolate and, of course, any fermented substance like, for example, alcohol). Surprisingly enough, there are still things left that one can eat: during non-fasting days, that is. Sharing meals with the *margiis*, I mostly followed their habits, although at times

I shamefully indulged in a cup of tea in the mornings or I skipped fasting days. It does not end here. Like many other religious philosophies AM emphasizes the spiritual part of life and, sadly from my viewpoint, overlooks the material side.



Figure 16. Sources Chaudes. On the left: Headquarters. On the right: detail of the kitchen.

This is reflected for example in their musical preferences. Margiis like kiirtan music which is appositely composed to accompany relaxation, meditation and spiritual enlightenment. The text for one complete song, and all of the songs, is made of one sentence: Ba'ba' Na'm Kevalam (Ba'ba' means the Dearest One, only the name of the Dearest One). They "sing" it, they "dance" it, they enjoy it to the point that that's all they listen to (luckily there are exceptions); enough to drive me crazy, although in small doses I did find it very pleasant, relaxing and joyful, if in an ethereal way. The first meditation of the day takes place when it is still dark, sometimes between 4 and 5 am. These I mostly missed, preferring to enjoy the guitar-accompanied chants from the warmth of my sleeping bag. Rules are not strict and each individual applies them according to his/her own inspiration. I have always been totally welcome to make my personal choices according to my preferences. Once they even bought me Nutella<sup>16</sup>, to cheer me up after I had been sick. The accommodation has been spartan, to say the least, but good hearted. In the capital I lived in the schools, showering from buckets and often dining in candle light. In Haiti a bulb light turned on for half an hour without anybody using it, means to go to sleep half an hour earlier for no reason. There a few vital things that this experience taught me not to take as granted: the possibility to charge my laptop, to read at night (which means after 18:00/19:00), and to charge the mobile phone.



Figure 17. Sources Chaudes. On the left: my sleeping room has been temporarily moved from its location due to water infiltration after heavy rain. On the right: production of bio-sand water filters and my translator Mackinson.

In Sources Chaudes there are hot springs, so it is possible to shower with running water in the public baths restructured by AMURT or swim in a thermal pool, a real treat.

Transport is one of AMURT's major problems. Cars are expensive and do not last for long in the rough roads of Haiti. I do not think I completed more than one entire trip from Port au Prince to Sources Chaudes without

<sup>16</sup> Italian hazelnut cream spread with a chocolaty taste

problems. Uncountable times people helped us in a way or the other, from pushing our car to offering a place to sleep for the night, to giving us a passage to the nearest mechanic or town. The solidarity of the local people made me almost enjoy (well, in the memories at least) these experiences and look at the white-spotless-closed windows (= aircon) vehicles of other much richer NGOs with a certain feeling of haughtiness. We were the real thing.



Figure 18. On the left: last preparations before this private track can leave Gonaives directed northwest with a cargo of goods and people, including me. This was the only available transportation to Sources Chaudes. On the right: AMURT’s pick-up tows a broken vehicle to PauP for repair.

In AMURT I mostly socialized with the other foreigners because of our closer background but I also worked with Haitian employees and volunteers, traveling, sharing meals, solving problems and enjoying relaxing moments.

**Living in Sources Chaudes.** My observation of the local reality in the area of intervention has been restricted to a level between passive and moderate. According to Spradley, a passive participant is like a spectator that finds an observation post from which to observe and record, while a moderate participation occurs when the ethnographer seeks to maintain a balance between being an outsider and an insider, between participation and observation. (p59 Spradley 1980)

The interaction in this case was limited to everyday life exchange. I often went to the market in Sources Chaudes, I participated in meetings and activities related to the ongoing programs, I mingled with people just for fun, taking pictures, learning Kompa dancing (the Haitian national dance similar to salsa) and teaching Lindy Hop, queuing at the bath house, soaking in the La-boue (thermal muddy pool) and so forth. The beauty of the place, the warmth of the hot springs, the poetry of a simple life, the warm welcome of the inhabitants make SousCho an easy place to love. Even if the enormous differences in cultural background prevent to a great extent intellectual identification and leave the exchange to a more epidemic level, I believe that this way of relating can also be deep.



Figure 19. Market in Sources Chaudes

Concluding, there has hardly been a study of objective undisturbed reality during this work. I became psychologically involved with the people in Haiti and especially in SousCho. Similarly, my presence and activity in the village has undoubtedly affected it. The mere fact of carrying out my interviews has influenced the way farmers looked at reforestation. I was at the same time investigating what the reforestation program had done and reminding people that there was a reforestation program and that it was important to AMURT. Also I was the living demonstration for the farmers that AMURT was interested in them, what they did, what they thought. More in general, I believe that my presence, with my way of doing things and the tools I used (camera, computer, liquid soap, etc.), has given its inevitable little contribution, like it or not, to the *cultural mélange* (Pieterse 2004) of this globalization era.

**Living in Haiti.** Although the security situation during my stay was quite worrying, I always felt welcome in the country. The few whites left in town were practically only cooperation workers so we would warmly smile at each other, like people do along hard trekking paths. The UN peacekeepers always greeted politely, I never understood why, maybe “opinion building”. The rich elite, predominantly mulattos, actively searched our company; whites get a privileged treatment just for the way they look. White is chique. The others were at worst indifferent and very pleasant if stimulated. In the country side *les blancs* are not a common sight, so every encounter is a source of entertainment. People had some difficulties to tell us apart, they often figured that being so similar we must have all been siblings. In some remote village *les blancs* are such a rare apparition that small kids burst out in terrified cries. The camera turned out to be a magnificent tool to socialize with since Haitians generally love to be photographed.

### 3.1.4 Qualitative interviews

As mentioned above, the use of qualitative interview gave me the flexibility I needed to approach the field while keeping a broad perspective. The semi-structured interview, as defined by Kvale, is “neither an open conversation nor a highly structured questionnaire. It has a sequence of themes to be covered as well as suggested questions. Yet at the same time there is an openness to changes of sequence and forms of questions in order to follow up the answers given and the stories told by the subjects” (p124 Kvale 1996).

The questions addressed to AMURT’s staff, the coordinator and the agronomists, were meant to provide me with an overview of the reforestation project, from practical information like timetable and areas of intervention, to more descriptive sections regarding the communication strategies. The interviews with local community members gave me the possibility to hear the impressions from the receivers’ point of view. The interview with the sociologist, taken during the second visit, had a different purpose, that of testing my hypothesis derived from the first set of data.

To record the interviews I used a video recorder. I did not transcribe the text but directly worked on the videotape. The interview material is in my eyes best used in its rough form since as Kvale states, the transcripts are “artificial constructions from an oral to a written mode of communication. Every transcription from one context to another involves a series of judgments and decisions” (p163 Kvale 1996).

Moreover, “too many methodical and theoretical problems of transforming oral speech into written texts are simply bypassed when the analyst works directly on recordings of the live conversations” (p175 Kvale 1996).

For example, the use of language (the local language, Creole/French; the study’s language, English; my native language, Italian) or the rendering of familiar forms to grammatically correct sentences are problems that characterize the transcription process.

I also believe that a videotape recorder is able to capture important aspects that are missed using an audio recorder or, even worse, taking notes. “A videotape recorder will encompass the visual aspects of the interview. With the inclusion of facial expressions and bodily posture, a videotape provides richer context for interpretations than it does audiotape. Video-recording offers a unique opportunity for analyzing the interpersonal interaction in an interview” (p161 Kvale 1996).

The language of the interviews was French or English, so that I did not need an interpreter.

### 3.1.5 Semi-surveys

I prepared a survey for the farmers involved in the reforestation project that included questions inspired by Rogers’ theory. As I started the interviews I realized how some information was superfluous or not interesting and other information was missing. So I continually adjusted the questionnaire.

I interviewed people on different stages of the program. One group had been informed about the project but had not started to participate yet. Another had just received the plants, and the last one had received the plants some months previously.

The farmers did not fill the data themselves but were asked by me. I spoke French and I was helped for the translation in Creole. I could for the most part understand or at least follow the translation so that I was at times able to judge if my assistants were referring to what was in my mind, and in certain cases thus put some more effort into explaining myself. It was for the most part too difficult for me to grasp the answers in countryside Creole.

The farmers considered me as a member of AMURT, often they would call me Kiirtana (mistaking me for another girl working there, although I'm 10 years older, 10 cm shorter and I have brown hair while she's blond; when I was denying this, they inevitably asked me if I was her sister). It felt too difficult to contrast the idea that we were all belonging somehow to the same gang. Seeing a bunch of E.T.s I would naturally assume that they all came from the same planet. I did not see any point in trying to explain the nuances of my role. On the other hand, I clearly stated that the purpose of my enquiry was to assess the progressing of the reforestation project in order to find possible improvements.

The identification of my person with AMURT could explain why people welcomed me kindly and were probably keener to undergo all the questions. On the other hand, they also saw me as a possible source of benefit, regardless of what I told them. For example I often had the impression that they imagined I could bring more plants and were trying to influence me in that direction, although most of my questions were in this respect neutral. Maybe the only strictly related question was exactly if they would have wanted more plants or seeds, which was anyway even more clearly answered by the general behavior than by words.

The selection of villages was mostly dictated by chance, as it was difficult to visit them on my own. I got the list of the villages from one of the agronomists and started with the most convenient, Sources Chaudes.

As Sources Chaudes is also the location of AMURT's headquarters, it was easy to walk around. My interpreter in this case was one of AMURT's employees from PauP, a young guy that normally works with the water filters, kind, open, sensitive with people; he was of great help in formulating the questions in adequate ways. For example, when asking about education I could notice that people who had never been to school were disturbed by my question, so we would tactfully also ask them about professional experience and schooling of their kids shifting emphasis to those aspects.

We started our tour by walk. The kids we met at every house got more and more interested in our activity and started to follow us, so that after a few visits we would be approaching a new household with a train of some fifteen screaming kids, who were particularly interested in the pictures I was taking. At first I tried to get rid of the kids since they were in my eyes disturbing my set. But, as I quickly realized, this was going to be impossible, so we just carried on with the kids. They soon took over the task to introduce us, patiently waited until I finished with my questions and then made sure that I did take the picture. I had started to take pictures of the nicest houses, or of those inhabitants that inspired me, but the kids turned the entire thing into a much more democratic process: everybody and every house was to be photographed. Pretending? No way, they checked each picture.

I wanted to interview anybody that was home and had been involved with the planting. Traditionally men work the land and women sell at the market, but this varies a lot with the structure of the family. As a result I talked to a balanced mix of men and women.



Figure 20. Farmers in Sources Chaudes during my first interview.

For this first visit it turned out that the plants had not been distributed yet to the farmers, except for two families (for inscrutable reasons), although everybody knew about the project as there had been a meeting where the committee of the village had informed the population. I therefore limited my interview to asking if the interviewee wanted to receive the plants and why.

The second set of interviews took place in the village of TPlace and other close ones, where one of the agronomists could take me around by motorbike. He also introduced me to the families and helped with translation. This situation had several disadvantages. First the agronomist could select the cases to his liking, most probably favoring the successful ones. Also, the farmers were bound in their answers as they might have feared disappointing him. Nevertheless, I tried to stimulate more spontaneous answers whenever necessary by creating a relaxed atmosphere (when asking if the instructions given by the agronomist had been clear enough, I was covering his ears or pretending to send him to chat elsewhere, with the great amusement of everybody). Moreover, whenever we met a random farmer along the way I made sure we stopped and carried out the interview. Unfortunately, I did not succeed in getting the agronomist profoundly interested in my questionnaire, so that toward the end he was showing signs of boredom. Also, I had the impression that, having a secondary school degree, he was slightly snobbish toward the farmers, which I did not like.



**Figure 21.** On the left: kids following the interviews in Soures Chaudes. On the right: farmer in his fields in LaRobe from the second round of interviews.

The last interviews, which I performed on my second visit, were done in a village that had not been involved with AMURT's programs. The people I talked to did not know AMURT so well and had no idea about the ongoing programs. As for the first group, the interview was here limited to the attitude toward reforestation.

The semi survey questions were divided into three clusters: adopters' characteristics, rate of adoption and communication networks. The first group was then divided into subgroups covering different aspects: economic status, education, mass media exposure, ambition, cosmopolitanism, and exposure to change agents. It soon became clear that some questions were superfluous. For example, everybody seemed to own their house or their land; I thought I could use the propensity to buy new properties as a measure of risk-taking predisposition of the person, but just in one case additional lots of land had been bought while in all other cases it was inherited. In truth I got the impression that people considered the question weird. This fact could be rooted in the history of Haiti, but I did not have the possibility to investigate further. Also the question about ambitions was either badly conceived or badly formulated or both. Everybody, with the exception of very old people, seemed to want more land, or animals, or plants; the only limiting factor was the economical possibility.

The family composition question, organized in predisposed pigeonholes, had to be modified from my initial formulation as my inbuilt stereotype of mother, father and kids, did not apply to the countryside Haitian idea of extended families.

## 3.2 Data collection and analysis

In this chapter the data accumulated during this study through interviews, surveys and observation are summarized and accompanied by some reflections. In the first paragraph of this chapter, I describe in some detail the specific topics related to the data derived from the questionnaire. The second part contains a broader analysis of the material enriched by the findings resulting from the interviews. Four of the interviewees were from the NGO, two agronomists and change agents according to Rogers' definition (Gilbert and Celidon), the project coordinator (Dharma), and one committee member in TPlace also responsible for the education in the solar ovens program. Another interview was carried out during a reforestation seminar for school teachers, this interview with the judge of Sources Chaudes, who was also present. The last interviewee is a professor at the faculty of social sciences in the Haitian capital.

The interview template is reported in Table 1. The conclusions drawn on the basis of the collected data suggest a picture of the Haitian situation which is in contrast to the reality of the country; this fact demanded a deeper contextual investigation to bring to the light possible explanatory factors. I therefore screened in the last section a handful of newspapers articles focusing on the reforestation problem in Haiti and synthesized the points that provide an perspective on the wider picture.

### 3.2.1 Questionnaire

The first group of interviews, counting for twenty-four families and performed in the village of Sources Chaudes with farmers that had not yet received the plants, was reduced to three questions: the will to receive plants, just fruits trees or also forest trees, and the motivation. The resulting answers already provided the central finding of the study. All farmers had a very positive attitude toward the project and all, with the exception of one woman who did not feel that she had the possibility to water the plants properly, were interested in participating. This caught me by surprise: it was not a case treated by Rogers' theory. My investigation was totally based on the existence of an adoption curve generated by a distribution of attitudes: favorable or against. Much of the intention of performing the study was connected to the assumption that some people would be adopting at different times and others would not, and the goal was to analyze the differences between those groups. Having all interviewees give homogeneous opinions, the premises for my entire study were not met. Even if, after this first set of interviews, I suspected that the answer to this question was not going to change, I carried on with my initial plan and tried to diversify the target.

The second and third sample of interviews, nine persons in total, were taken on different days, in different villages, and I was accompanied by a different guide. In this case all the interviewees had received the plants. The set of questions that I used in these two occasions, as a guide for the semi-survey, are shown in **Table 4**. Also in this case, the overwhelming majority of the interviewees answered that they were interested in getting more fruit and forest trees. Just one young girl did not want forest trees as she had a very tiny piece of land. Following Rogers' division of adopters into categories according to their propensity toward adoption, basically all of these interviewees would belong to the class of early adopters. They received the information and happily joined. These data could therefore not be used to confront Rogers' description of adopters' characteristics. They nevertheless did provide interesting data about the sample of population affected by the project. The first question to answer is whether or not the sample I collected was sufficiently differentiated and roughly representative of the social situation present in the area. Given that the farmers' population in the region is fairly homogeneous I do believe that the sample I collected is quite broad. As the data grouping Table 5 shows, it includes a wide spectrum of socio-economic and cultural situations, as well as different exposure to media. Table 6 summarizes the collected data.

In the following graphs the salient information is visualized.

Age, Gender and economy. Figure 22 shows the balance between genders. Figure 23 shows the age distribution divided in five groups and varying from 25 to 78 years. Each group is represented even if the average age is 55. This tendency toward older age is explained by the fact that most young men leave the area in search for jobs, so that prevalently elderly people are left to work in the fields.

Figure 24 shows the economic situation. Many peasants in the region live off of subsistence farming and to evaluate their wealth is not an easy task. With the AMURT's staff I tried to devise an indirect way to weight the economical status by asking about material belongings. For example, we thought that to sell at the local market would be a sign of surplus production and would therefore indicate a higher income. The ownership of cows and horses also indicates higher possibilities as well as motorbikes or cars. Although it turned out that the initial choice of questions was too broad (nobody had car or motorbikes) and some of them were not relevant (everybody was selling at the market every now and then, no matter how little), I was able in the end to order the interviewees in groups, fine tuning elements like ownership of land, animals and more importantly the presence of non-farming related incomes in the family.

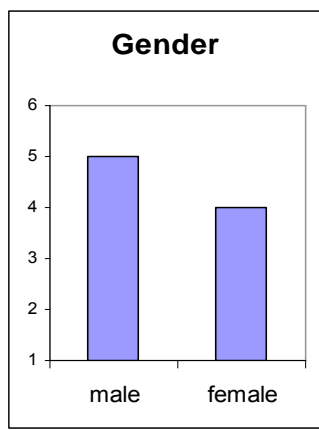


Figure 22. Gender distribution

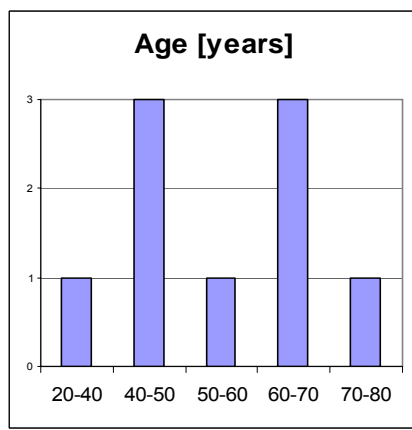


Figure 23. Age. Youngest 25, oldest 78, average 55 years old.

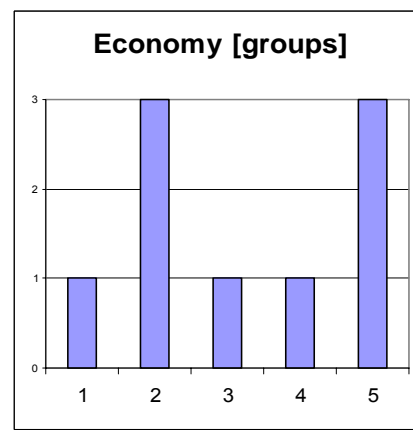


Figure 24. Economy. From richest to poorest

Education, communication channels and social status. As shown in Figure 25 educational levels are very low in this area. The people that managed to get educated moved somewhere else or have more remunerative jobs than farming. None of the interviewees went to secondary school, even if in one family other members did. Communication channels are quite reduced. I did not meet anybody who owned a TV, also because there is no electricity. Radios are present even if not common. According to a survey that AMURT carried out there are few local broadcasting stations that are possible to receive, from the nearest towns of Gonaives and Anse Rouge and another one from a close village. Radios are mainly supported by aid agencies. The most popular (and often only) programs are built around music: kompa and church choruses; not voodoo, however, as it is not encouraged (actually it is hindered) by most donors. I therefore tried to evaluate the communication possibilities of people through their networks.

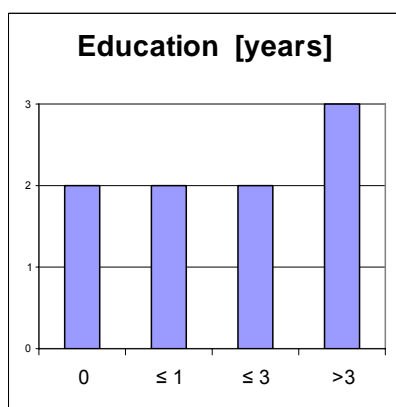


Figure 25. Education. Approximate time spent in elementary school.

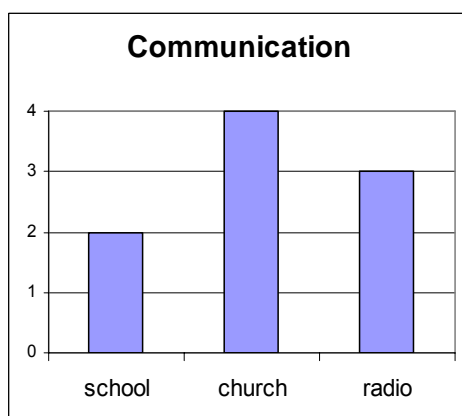


Figure 26. Communication channels

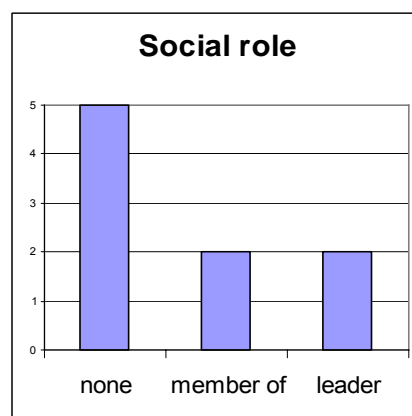


Figure 27. Social role. Divided in no role, member of some group and leader.

I also specifically asked about whom the farmers had talked with about the reforestation project and from where they had learnt about it. The answers were consistently attesting that everybody had talked to friends and all had heard about the program from the village committee when the initiative was exposed to the population; the communities being so small this result was not surprising, but this meant that a further investigation in terms of communication networks was meaningless in the context.

For my classification I assumed that kids could bring information home to their parents from school, and that another point to acquire information would be at church, as suggested in the interviews. Figure 26 shows the classification following these criteria.

The social role could vary from being the sacristan at church or member of a committee to being the voodoo priest. In Figure 27 I differentiated groups from not having a social role, to belonging to a group and playing a role of leadership. Also in this case all groups were represented.

Contacts with change agents. Another significant factor in DoI theory is the number of contacts with the change agents. As mentioned in section 2.2.4d this is one of the traits that positively correlated with the predisposition to accept innovations. The receivers that adopt earlier and easier are also the ones that are most visited by the change agents. My intention was to investigate if this applied in this particular case as well and, if so, why. What resulted from the answers, though, was that in most cases people could not tell the precise figure of contacts, they expressed themselves with a gesture as to say “ohh many, many”. Beyond numbers, they gave me the impression of a constant frequentation. In fact all farmers lived in the same village or neighboring villages where the agronomist was based; moreover most of them were chosen for the interview by the agronomist himself.

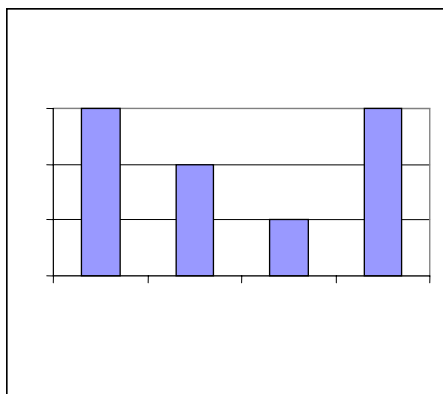


Figure 28. Cosmopolitanism

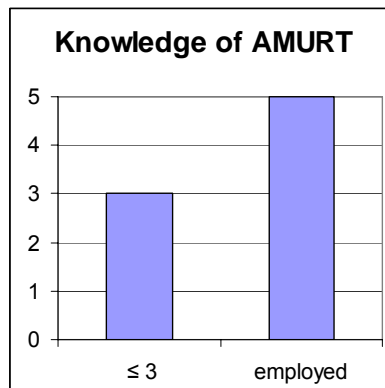


Figure 29. Number of AMURT's programs known

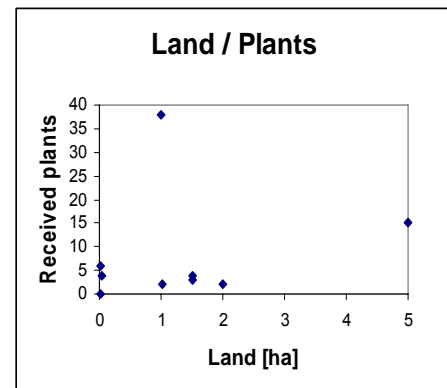


Figure 30. Correlation between received plants and land extension

Cosmopolitanism. In order to evaluate the degree of exchange with external realities (see Figure 28) I considered five groups: people living in the same area from birth, coming from another place, traveling to town more or less frequently and having relatives abroad. Nobody was born elsewhere, which is in agreement with the fact that the land was mostly inherited. The highest importance is given to the last category since relatives living abroad are not just providing economic support but also directly reinvesting in the native areas bringing an external perspective and greatly influencing the local setting.

NGO's importance. The question about the familiarity with the NGO was added when I realized that all farmers wanted to participate in the project, to verify if the closeness with the organization could be a reason for this positive predisposition. All farmers knew AMURT and had somehow at least heard of the programs, which included: the restoration of roads and irrigation systems in the area, construction of a water reservoir and a school in TPlace and manufacturing of water filters. Often, people had also been directly employed by AMURT in one way or the other.

## 3.2.2 Analysis of AMURT's intervention

### a. Unexpected consequences

One consideration regards the unexpected consequences that the reforestation project could bring. As reported by Rogers, "the consequences of the diffusion of innovations usually widen the socio-economic gap between the audience segments' previously high and low in socio-economic status" (p460 Rogers 1995).

On the one hand, as stated in several interviews "the difference in income between the farmers is irrelevant; everybody in these villages is poor, especially after cyclone Jeanne" (agronomist Celidon). "In this region the nature is so degraded that the cultivation does not bring enough products; the area is desertified, there is no water and not enough food is produced; there is no job; there are some rich but the majority is poor" (agronomist Gilbert).

On the other hand, although the homogeneity of the economical situation in the area is confirmed by the survey, the investigation revealed a possible source of increases in the economical gap.

Indeed, the decision concerning how to distribute the plants among the beneficiaries was made by the agronomists together with the committees. "Each village committee decides who will have the plants; the technicians are going around with the committee, find the places where the plants will be placed and prepare the holes" (agronomist Celidon). The decisions are "not based on sociological data assessment as everybody is poor there so the economic level is quite homogeneous" (project coordinator Dharma) but on the available amount of land owned by each participant "people having greater pieces of land would also receive more plants" (committee member Veve').

The agronomists' reasoning was grounded on the fact that each plant needs a certain given space to grow, so that it was in their eyes logical to linearly correlate the number of plants with available land (most probably the distribution criteria also included considerations like the availability of water in the proximity).

In this way though, the neediest people are not benefited since they do not have the land: "the most miserable maybe have some place to live but not the land to work" (agronomist Gilbert). Moreover, richer land owners would be able to produce more fruits or more wood. Figure 30 does not show a precise correlation, although it is clear that more plants were donated to people owning more land. One can observe that while the number of plants normally distributed was less than 5, in two cases, both owners of bigger parcels, it has been more than 10.

This could mean that the approach followed by the program, of distributing sources of economical value (the trees) to individuals, works on one side as motivational factor and on the other might introduce an economical disequilibrium.

This is in contrast with AMURT's usual praxis as indicated by other interventions. "In the rehabilitation of salt mines destroyed by cyclone Jeanne, there was an explicit policy of targeting the poorest owners; and also the employment criteria of AMURT are always directed toward the neediest" (project coordinator Dharma).

In the reforestation program, from the NGO perspective the goal is met independently of which farmers are planting the trees. From the community point of view, it is different. On one hand, the long-term positive effect of the reforestation project, i.e. the global improvement of the environment, will affect the whole population and the short-term gives job opportunities for the neediest. On the other hand, it remains to evaluate the medium-term impact which might favor the richest.

Would it have been possible to choose a more neutral approach, by creating public reforestation areas? How would it work? Who should be responsible for those areas?

In fact, an intermediate solution had been adopted in one of the villages, AtDimanche, where pre-existing skills among the citizens ("they knew how to prune, to graft" [agronomist Celidon]) gave the opportunity to form a cooperative and launch a village nursery: "we took a piece of land and the population with AMURT did plant trees in co-partnership" (agronomist Celidon).

It would be interesting to check the success of this initiative and compare it with that of the distribution to individual farmers' strategy.

Strategies to avoid unexpected consequences. Otherwise, recalling section 3.1.1, several of the strategies recommended by DoI research to narrow economical gaps and ensure the largest participation, were adopted by the NGO.

As known from the interviews, the language of the program is Creole, in contrast with some of the education in Haiti, which is still done in French and which thus excludes large part of the weakest sector of the population.

Moreover, the messages were tailored in different fashions for the various audiences. A form of content adaptation to the segmentation of the audience (see section 2.2.5) is operated in the choice of subjects treated in the educational material directed to the different listeners. The training for the teachers regards the “functioning of natural systems, specific notions about the local environment, reflections in relation to its degradation and critical assessment of its causes” (agronomist Gilbert). In the case of the farmers, other more practical topics, relevant to their reality, are discussed: “planting techniques and more in general, the conservation of the soil, the preparation of compost bags and so forth” (agronomist Gilbert). Moreover, communication is based on interpersonal channels. The message is conveyed by direct contact through fairly homophile channels: the agronomists or village committees. All projects are conducted working with groups thus enhancing peer evaluation and applying social pressure on “laggards”. Finally the incorporation of seeds distribution in the program is an action that especially benefits “downs”.

## b. Adopters

Although the scarcity of data does not consent to make statistical considerations, one can say that the interviewed people had fairly different characteristics and therefore were representative of the farmers’ population in the area. As all farmers positively welcomed the project, it is not possible, with the sole use of these data, to derive answers to the research questions originally at the center of this study, regarding the characteristics of the different categories of adopters.

On the other hand, in these settings, where the highest income is assured by having a relative in the US, and the next by having a member of the family bringing home another income, it would have been in any case quite hard to draw conclusions about the correlations between education, socioeconomic status, and adoption rates.

Cultural transposition. Nevertheless, some observations may be drawn comparing the sample as a whole with the traits of classical cases found in literature. The situation in this area is very different from the ones found in western environments. While in richer places more education means a higher income, and a risk-taking predisposition could entail a sequence of implications, from cosmopolitanism to higher social status, here there simply is not the possibility to get educated or to travel even for people that would like to do so. The personal natural curiosity and the predisposition to engage in new activities are not exploited for lack of means. Simplifying, the picture obtained by gathering these data, is that the farmers in the area are not highly educated, rich, cosmopolitan, etc., but, all the same, eagerly want to participate in an innovatory program.

This attitude toward innovations is confirmed by the observations I gathered throughout the mini-solar-panels campaign, during my second visit. Electricity being absent in the region, people are always very interested in programs that tackle this problem. The problem has been submitted to AMURT several times. We presented the mini-solar panels technique and explained the details of how it works on different occasions: at the market and during committee meetings.



Figure 31. On the left: one of AMURT’s volunteers at the market in Sources Chaudes, shows how a radio receiver can be powered by a mini-solar-panel. On the right: AMURT and local electrician introducing mini-solar-panel technology at a community meeting in Point des Mangues.

These mini-solar panels can power a radio, charge a mobile phone or even charge car batteries, which can thereafter provide energy for example for light bulbs, refrigerators, etc. A mini-solar panel can be assembled in

loco and costs approximately 10\$ for 12Volts. People reacted with such enthusiasm that it created a problem for us. The news spread like fire and it created a flux of persons constantly coming to the headquarters wanting to make sure their names were on our list (we did not have any list). Villages started to gather money from all interested families to buy the material and were ready to initiate a program before we could even realize what was happening (the football world cup was about to start).

Early adopters. These results indicate that the elements pointed to by Dol theory as characterizing early adopters cannot be easily applied to contexts deeply different from the ones where they were first derived. The set of variables proposed, such as education, cosmopolitanism and socioeconomic status, are not appropriate to describe Sources Chaudes early adopters. As a concrete example, in enabling environments, education can be the result of innovativeness (one could argue that curious kids are more likely to enjoy learning and will therefore continue education to higher levels), while in impoverished realities this link might not be present since the lack of education does not indicate absence of curiosity, but just lack of means to go to school. Indeed, the weakness of Dol formulation on the attempt to identify early adopters is that of being based on empirical correlations between innovativeness and factors introduced in an arbitrary manner (lower dogmatism, greater empathy, intelligence, to name some of the weirdest) without the backing structure of a theoretical frame explaining why those parameters should be connected to innovativeness.

From the agronomists we learned that people are indeed differently involved in the program. After the first contact is made with the village committee, Celidon says, "We do another visit where all together with the committee we are preparing the terrain, mixing compost brought by AMURT with soil; then the most intelligent persons in the group, will be able to promote it further in the village and teach others who will learn with practice. [...The most intelligent] are the ones that are fastest to understand, or the ones that get engaged in the project because they love it and put more time in it to learn and continue the job" (Celidon).

This could indicate a natural (genetic) predisposition (they love it) not necessarily connected to contingent factors. According to Gilbert on the other hand: "the most open people to receive information, the ones who listen carefully, are those who go to church, who have education; this is due to the fact that they can relate to something they know. The ones who speak a very basic Creole, never went to church or school, do not have the habit to learn and they will therefore listen passively. Analphabets are hard to teach. It would be needed to have alphabetization classes. The message would pass more easily" (Gilbert). This could indicate at first glance a link with the educational factor. However, it has to be considered that the level here refers to the very ability to pay attention on the part of the farmer and the incapacity to make himself understood on the part of the agronomist, for example for lack of patience. In other words, was Gilbert using the proper tones and arguments to communicate to those analphabet farmers and catch their attention?

### **c. AMURT's communication strategy**

Let us try now to analyze more in detail the reasons why people in Haiti are so positive toward the reforestation program.

#### Innovation characteristics.

*Advantage.* Thinking about it, the farmers' position seems logical: the trees were going to be distributed for free and they would bring the obvious advantage of producing fruits, shadow and eventually wood, as all interviewees remarked when asked to justify their assertions.

*Compatibility.* Cultural elements like the central role that trees play in Voodoo, as in many other pagan religions, just reinforce the conviction that the farmers' attitude is not dissonant with their beliefs. Trees are dear to the spirits, they are important for the liturgy and they are represented by a specific god (see 1.1.3).

*Preventive innovation.* In this sense, the introduction of fruit trees cannot be completely considered as an innovation since farmers already know the advantages that fruit trees bring. In other words, by introducing reforestation in a broader program including activities that produce visible and familiar benefits, like the distribution of seeds and fruit trees, AMURT has transformed the meaning of the innovation. For the implementing agency the planting of trees is mainly a preventive innovation since the rewards are visible just from a long-term perspective (blocking soil erosion, retention of water, etc.). These benefits are difficult to communicate without involving technical knowledge, and probably have a low motivation degree. But for the potential adopters there are other meaningful factors that make the adoption worthy, like the clear economical

advantage; moreover the practice is consistent with existing values, practices, past experiences and needs; also, it is an already known activity so that the innovation criteria of triability, observability and less-complexity (see 2.2.2), are all met.

*Re-invention.* As it emerged from the interviews (Celidon), the case of AtDimanche, where the presence of experts resulted in the immediate creation of a local tree nursery, also demonstrates the high degree of re-invention (see 2.2.2) contained in the program. Tree nursery activity was originally meant to be in TPlace, but because of the presence of knowledgeable local people that had been previously trained by another NGO, the opportunity to open a new center arose, and it was immediately seized. This approach in designing the project, derived partially from the agronomist Celidon's expertise and familiarity with the problems and partially from the influence of the local committees, assured a good level of adaptation of the diffusion strategy to the local settings.

*Technology clusters.* Finally, the holistic approach of the NGO has to be noticed. The project tried to find an integrated solution tackling a cluster of problems together, not just giving trees without caring about the rest. "Innovations often are not viewed singularly by individuals. Instead, they may be perceived as an interrelated bundle of new ideas. The adoption of one new idea might trigger the adoption of others" (p249 Rogers 1995). "While we talk about reforestation, we always also talk about water filtration" (agronomist Gilbert).

Change agents. Information is flowing in a fairly homophile way. The agents' team is composed of three agronomists, all Haitians from the same rural area where the project is implemented or from a neighboring region. The communication between them and the school teachers during seminars happens thus on the same level. The farmers, on the other hand, do have a slightly different background from educational and to some extent economic points of view.

Nevertheless, in the survey, the farmers mostly confirmed that the specific training about planting and watering techniques was clear enough.

In fact, from the survey it is seen that the number of visits paid by the experts to the farmers was quite high, to the point of giving the impression of a constant presence more than a scheduled routine.

Then again, the people I talked to were all direct clients of the agronomists since they were the first ones affected by the project, working their fields in the same spot where the agronomists are living. However, as the program goes on, more distant villages are being affected.

The question is how the communication would work in these slightly different settings. A guess can be derived from the interviewees' descriptions of the implementation strategy performed in these other villages. As reported in the interviews, the process involved the agronomists contacting the village committee and, in the first phase, transferring knowledge to them; thereafter they support the further spreading toward other citizens.

The communication is thus substantially left in the hands of the villages' leaders, assuring homophily, social pressure and constant support.

Influence of social structure. It seems that the whole concept of contacts between change agents and clients totally differs from the dynamics present in urban environments. Here we have very small villages, where everybody knows everybody else and where social life and the ruling of public affairs is organized in a communitarian way.

The social structure of the villages is an ideal situation for the spreading of the innovation, if the innovation is accepted. From the interviews a reality emerges in which people do not just take individual decisions. The description of the program implementation - "the most intelligent (understand faster and show interest) will start and then drag the others, who will learn by practice" - reveals a certain component of coercion where the "negligents" are pushed by the others (agronomist Celidon).

The original change agent, the NGO, has somehow a quite passive role, mainly that of providing resources, while the channeling of communication towards receivers is all happening at the local level.

Opinion leaders. The presence of the committee members and other prominent figures of the villages' life, in the programs is, through the action of their opinion leadership, an incentive for the acceptance of the project. In the settings of these small villages, committee members are usually both political and opinion leaders. "In most places, the committees are democratically elected and everybody participates in their meetings" (project coordinator Dharma) although some other times "the relationship with the citizens is less strong, so we have to put an additional effort to handle conflicts" (project coordinator Dharma).

If the organization and the agents are kept in high esteem, they will be listened to. The frequent contact with the leaders, therefore gives AMURT an entry key. For example the agronomist Gilbert was living at the voodoo priest house, and he was having daily lunch at one of the most influent families in the village. At a more organizational level, all stages of the implementation have been supervised by local leaders. They have been the ones contacted first, they organized the meetings with the population, they have been actively involved in the various steps of the program, from choosing the participants to the plants distribution.

Participation. The alliances that were built between AMURT and the existing structures permitted the entrusting of the practical organization of the program to village committees. "The idea of reforestation was negotiated with the representatives of the villages. They were asked about what exigencies they had and reforestation was always one of them" (project coordinator Dharma).

Seemingly it was not even required for a transfer of technical knowledge. On the contrary, "even if the education level is very low in the area, local leaders were aware of the problem of cutting trees and of the link between the dropping of the water table and deforestation. It was easy to promote the program; people already had priorities in mind, so that at the first big meeting organized by AMURT where all villages in the area were invited, most communities were interested" (project man coordinator ager Dharma)

The participation in AMURT's work is not just limited to the leaders though. "The contact happens through the village leaders but then a meeting is organized with the complete population and things are discussed; AMURT asks for what problems there are in the village and people spontaneously express their opinions which are noted down" (agronomist Celidon). Only the people who have the land are actively participating in the program, but everybody is nonetheless interested. Also, the specific choice of trees is made by the agronomists according to the soil type but also according to the pre-existing experience of the farmers: i.e., "with the peasants that have land, especially the elders" (agronomist Celidon)

More in general, at the headquarters in Sources Chaudes people are going in and out as though it were a post office. Anybody can come and demand attention. I would define this as ownerships more than as participation: AMURT is owned by the population. Women from neighbor villages stop by on their way to the market to point out something. Students organized in small voluntary associations come often with proposals for social projects: latrines, a radio station, potable water. Teachers come to promote their schools. It is a bustle. It is clear that AMURT is seen by the citizens as a way to realize their own projects and dreams and as an inspiration to imagine new ones. It is maybe not so strange that when the programs finally get going the acceptance is high. They are their programs.

Sustainability. The same attitude has repercussions over the responsibility aspect. Whether it is planned or not the organization is often run in a fairly disorganized manner. I saw several times a disaster on its way and Dharma, the project coordinator, sitting and meditating leaving to the employees the task of finding a solution. Other times help comes from the local community; for example when a mountain of food arrived from PAM (Programme Alimentaire Mondiale) the village organized a vigilance service. It does not always work in an obviously intended way, but I nevertheless believe that this is maybe the most important trait of AMURT's working style, as it is now. First of all, what are the chances that foreigners would be able to operate in the local reality with any superior cleverness and judgment? Moreover, it is a sustainable approach as it is heavily based on local human and logistic resources.

Another significant element that points in the direction of sustainable practice is that as a first step in the replanting approach there is the creation of a tree nursery. Indeed, even if for the time being the trees are given for free and the agronomists are paid by AMURT, it would in principle be possible in the future to shift to an economically sustainable activity by introducing fees for seeds and trees. In this way a system has been created which includes the physical structure to perpetuate the program, but also has built capacity and initiated a positive loop of production. "It's a long-term program, which is basically creating a seeds bank; seeds were first distributed to cooperatives that are now going to return the seeds derived from their own growing; and the nursery keeps on replanting seeds and making bags" (project coordinator Dharma).

A final observation concerns the effects of incentives. As Rogers states, "although incentives increase the quantity of adopters of an innovation, the quality of such adoption decisions may be relatively low, thus limiting the intended consequences of adoption. If individuals adopt an innovation partially in order to obtain an incentive there is relatively less motivation to continue using the innovation, and so the innovation's sustainability may be lessened" (p238 Rogers 1995). The fact that agronomist Celidon suggested focusing on cash crops in this phase of the project can be seen as a form of incentive. However, this cannot in my view be

considered a pure incentive since it is not a monetary compensation independent from the project but is a part of it.

A trickier point was raised by the interview with Gilbert: “sometimes farmers are not interested in learning about environmental threats, so there are strategies to catch their attention. [...] To attract even the most difficult farmers one has to offer something; can be plants of seeds; if there is nothing to offer, organize a lunch, or promise to talk about irrigation plans” (agronomist Gilbert). A less controversial strategy also used was “to provide the lessons during the distribution of the plants: people then are more predisposed to listen since they are rewarded afterwards with the plant” (agronomist Gilbert). Perhaps, as the agronomist mentioned, “a better strategy to involve the farmers would be to go through ODD, the organization for the development of agriculture which is present in the area where I come from. There are specific days when the organization members meet to discuss various issues. Formation would be better done through these natural moments of encounter. But in this area things are just starting, it takes time to organize” (agronomist Gilbert).



Figure 32. On the left: trip to PauP, pushing the car uphill. On the right: food from PAM is being organized in the headquarters.

Feed-back. Evaluation is the mechanism that allows the organization an internal scrutiny to verify the response its own actions and their consistency with the original intents. Although it is difficult to set measurable goals for these kinds of programs because of their time scale, for example the water table rehabilitation is a very long-term result, the measure taken into account in this preliminary phase is the production of the seedlings. This is quite common among implementing agencies. But it does not really account for the success of the program. A better strategy is that of checking the survival rates of the plants after their location at different time points. According to Gilbert, the first feedback occurs “after 2-3 weeks we go to visit the land and check how many survived and distribute other plants to substitute the ones that died” (agronomist Gilbert). The next moment is “after one or two months, with the farmers, we go back and check; it was found a percentage of loss between 2 and 5%” (agronomist Celidon). The data on the plants that have been distributed and the percentage of those who died is reported in Table 2. The percentage of plants that survived so far is quite high.

Gender. It is AMURT’s policy to have “a gender-sensitive approach which favors the employment of women, their participation in programs and their involvement in decision making” (project coordinator Dharma). AMURT is definitely advocating for the presence of women in all activities: as committee members, participants in seminars and employees. I did not have the impression that this was a too big interference forced upon the local traditions. From what I could see Haitian women enjoy a good level of independence. Many households are lead by women, as men often have to look for a job far from home. Also in voodoo religion priests (hungan and mambo) are represented by both sexes.

Regarding the reforestation program the agronomist says that “the receivers are both men and women, but usually guys are working in the fields and women collect the products and sell at the market. So often it is the woman who comes to the courses since the man does not have the time; she will transfer the message without problems; in the nursery women are preparing the compost in small bags, they get a small salary which is nevertheless a good help for their families” (agronomist Gilbert)

#### d. AMURT's approach

Identification. The spiritual side of the organization has a strong impact on the life standards. Frugality and pauperisms are prescribed and encouraged. Most margiis I met do not give emphasis to material aspects of life (in particular the diet often earns even the pity of Haitians, not surprisingly). This gives the NGO the advantage of fitting Haitian's living conditions in an easier way. Volunteers are still richer than the population on average but they do not stand out in an offending way. The economic situation of the NGO is such that at times, due to delays in payments from the donors' agencies, there is no money left, even to buy food. In the words of the project coordinator: "I've been to many meetings, building a mutual understanding from the grassroots.... I never felt that the local people perceived us as strangers, maybe also due to the approach of the people we are hiring. We are a very small organization with lots of problems that people can see, at the material level; our cars are broken most of the times, the accommodations are basic, we are borrowing moneys from the locals. When you get to a village and people see you pushing your car into a meeting, they identify with your trouble. They also know that we are a volunteer organization, the staff lives in the villages, in a very isolated setting, without energy and comforts. In big organizations the practice is different; one person visits the village for 15 minutes and then goes back to the capital. We have been living in the village now for one year, the relationship is very intimate. We know all the committees in the villages, we have friendships, we know the problems and they know us, so they are more forgiving, and we tend to be more in tune we what they need. They don't look at us like strangers. Everything we are doing is because they wanted it" (project coordinator Dharma). This kind of interaction opens the way to a level of identification and reciprocity that cannot be reached in other ways.



Figure 33. Kids from AMURT's school in PauP

Sympathy. In other words, the way AMURT relates to people inspires social empathy. When I asked the farmers if they knew about the organization's activities I often had to reformulate the question using the names of the volunteers instead of the name of the NGO. People knew Dharma, they knew Kiirtana, then Sampurna. There are newborn kids in the area bearing their names (spiritual names). Answering my question about the familiarity with AMURT's activities, an old man said that yes, he knew, since Dharma, passing by his field, had stopped for a brief chat.

Trust. A big role in the intimacy of this relationship is played by the stable presence and long-term commitment of the organization in the country, which dates almost thirty years with the education (two schools) and medical facilities in the capital; the existing network of contacts and links with the social system provides a strong support for all activities which originates from the local reality. AMURT could respond in good time to the emergency created by hurricane Jeanne in 2004 with a relief intervention in the North West. It was this experience, in close contact with the local population and their daily problems, which inspired the launch of the development work. As the project coordinator reminds: "We spent half a year giving food to the people on the coastal villages; we saw the sand storms, the big impact of the hurricane, the dust balls sweeping in into the villages... we realized that the environment was at the source of a multitude of problems: infrastructure, water, etc." (project coordinator Dharma). The trust of the local committees and the citizens was gained with time through countless meetings.

### e. Question marks

The conclusions drawn so far are that the population seems to be very receptive or even promoting. Is this fact a result of the NGO strategy or is it based on other factors?

To answer this question the third set of brief inquiries was carried out in a village where AMURT had not been active. There too people were immediately favorable to the idea of planting fruit trees, but the scarcity of water would have been a realistic obstacle to the success of the initiative, as the interviewees recognized when I specifically asked about this aspect. This would indicate that farmers are sensitive and aware of reforestation problems regardless of the agency, but that the success of a reforestation initiative requires more than a favorable attitude from the local population.

Another hint is provided by the interview with Prof. Claude, sociologist at the University of Quisqueya, who confirms that the incorporation of economic incentives in reforestation programs is the only viable route; he suggests that “the destruction of the woods is linked to economic reasons since it is done to produce charcoal. [...] Deforestation is not done for vandalism or bad will, but for necessity. [...] To cure the sickness it is necessary to start from the cause not from the effect” (sociologist Claude).

This would indicate that the inclusion of the economic incentive in AMURT’s program has been decisive.

Putting these elements together it would seem that a program able to link reforestation to different aspects of Haitian reality (economic, structural, etc.), and a locally driven implementation strategy could be the key for success.

Is then AMURT the only organization that is able to apply the right recipe? From a brief Internet-based review the contrary seems to be true. There certainly are many programs that have not been able to construct a winning strategy for one reason or another, but there are also some successful examples. But then again, why isn’t the complete island covered by lush vegetation? Or at least by fruit tree plantations?

### 3.2.3 The bigger picture

There is certainly no lack of past and present programs focusing on environmental degradation in Haiti. I collected a random, non-exhaustive sample of articles coming from different newspapers and written at different times. The general picture seems to indicate that for the past ten years, the discussion around deforestation has remained unchanged, to the point that all sources can be blended without discontinuity. “International organizations have poured millions of dollars into Haiti to try to slow the country’s devastating deforestation, and they have little to show for it. Twenty years after reforestation efforts began in earnest, the mountains are barer, the trees scarcer. And the country’s soil is still slowly sliding into the sea” (Nesmith 2004). What all papers are agreeing on is that at the roots of deforestation there is the combined effect of poverty and the lack of alternative sources of energy to replace the use of charcoal. “For a half-century, nonprofit and government programs have largely failed to stem deforestation, which is driven by Haiti’s dependence on charcoal for cooking and on lucrative timber exports” (Tailer 2006). “People rely on the burning of charcoal for their energy needs, not only in Port-au-Prince, but also throughout the country” (Vedrine 2002). “In a country with 70% unemployment, cutting trees and selling the wood to make charcoal is one of the few ways an indigent Haitian can make a living [...]. As long as grinding poverty afflicts all but a tiny segment of this country, the majority of Haitians will be compelled to give priority to the daily demands of buying food and putting a roof over their families” (2003 Williams).

Poverty afflicts the country also at the national level making any kind of economic activity rely on insufficient public structures. One of the articles laments the presence of “obstacles in getting products to market: bandits who demand protection money, bridges washed out along the bumpy dirt road that passes for a highway, and fruit that spoils in transit because producers lack sufficient crates to pack it properly” (Tailer 2006).

One critique toward reforestation projects implemented so far is that such a reality requires an integrated approach; reforestation has to be accompanied by the generation of income, the introduction of other ways of cooking and ways to confront other impellent problems: “we see there are no trees so we plant trees, but we are not attacking the roots of the problem here” (Reuters 1998).

Another point is that it is unlikely that single and unorchestrated interventions can succeed in tackling an issue that interests the country in complex ways: “local groups and government projects have undertaken scattered tree-planting campaigns. But random planting will not solve Haiti’s problems” (Reuters 1998).

But if an essential part of the fight against deforestation resides in the ability to tackle the economic aspect, it seems that also in the past there have been programs that took account of this aspect, offering income

alternatives for the population; they failed nevertheless. An article from 1997 excitedly reports that “with U.S. technical help and marketing wizardry, the gourmet bean -- Haitian Bleu -- is hopping off the shelves of American stores at premium prices. And because coffee requires the shade of larger trees to thrive, growers for the first time have a compelling economic reason to keep the land forested, thus protecting some of Haiti's last viable watersheds” (Marguis 1997). What was the project approach and why did it not succeed? The major contribution of the program had been to assure the entrance of Haitian coffee on US market “although Jamaican Blue Mountain still reigns supreme, commanding nearly \$50 a pound, Haitian Bleu has quickly established itself as a smooth contender – hailing from a similar climate – for \$40 less a pound” (Marguis 1997). The picture emerging from this case depicts a controversial developmental strategy: the local production is linked with western markets. This on one side generates income, but, on the other, also dependency and exploitation (Americans can decide to influence political decisions by threatening the economy or simply can change taste for coffee toward other brands; also, Haitian and Jamaican coffee are in competition which can lead to a destructive race toward price reduction).

For a weak economy like that of Haiti these can be fatal ingredients. In fact, the use of trees to shade coffee was not a new idea; the same article mentions that the commerce of Haitian coffee had been ruined “[a] half-dozen years ago, when the world community clamped Haiti in a trade embargo, trying to force out military rulers” (Marguis 1997). As introduced by the last quote, the central role that the Haitian political context plays in this analysis cannot be forgotten.

Political instability is often an obstacle to a coherent intervention: “political in-fighting and the government crisis that has left Haiti without a prime minister for 18 months have aggravated the already disastrous environmental situation” (Reuters 1998), and also “influences the way projects are planned“, while Haiti could easily double its fruit exports, international donors shun long-term projects [...], preferring 18-month commitments because of Haiti's instability” (Tailor 2006).

While one article encouragingly states that “the government will take aggressive steps to protect the environment and has just completed a National Environmental Action Plan outlining problems and solutions” (Vedrine 1999), the next article lowers hopes. “[E]fforts have been stymied by rivalries between the government and opposition, with millions of dollars in international aid suspended since flawed 2000 legislative elections. Some was earmarked for environmental projects” (Associated Press 2003). And just a few months after aid goes up again, “Foreign-funded organizations such as the Haitian Environmental Foundation are making inroads by promoting tree-planting and developing alternatives for fueling stoves. Scientists working with the organization have developed briquettes made from compressed recycled paper that burn more efficiently and cleanly than charcoal. Last year the agency (USAID) replaced 47,000 wood stoves with oil-fired burners and planted 600,000 trees in the most denuded and endangered regions” (Williams 2003).

One year after another articles report, as in a *deja vue*, that “the U.S. Agency for International Development is no longer financing reforestation in Haiti. The projects ended in 2001, after tainted elections led to an international aid embargo against the government of former President Jean-Bertrand Aristide. And the \$1.3 billion aid plan cobbled together by foreign donors after Aristide was ousted last February allots only \$8 million for environmental programs – none of it for reforestation. The World Bank also is not financing any reforestation” (Nesmith 2004).

For reforestation, commitment is an especially crucial aspect that might have been determinant for the failure of many programs. The article about coffee concludes saying that “relief strategists [...] are skeptical that the U.S. government will stick around long enough for Haiti to heal. ‘Washington wants results that are fast’ [...] Mother Nature doesn't always agree” (Marguis 1997).

Perhaps, the geopolitically strategic position of Haiti, very close to both Cuba and the US, has also had an influence on the series of embargos that have been imposed. In the 1980s, the organization for the Rehabilitation of the Environment (founded by the Finningans, a Haitian-English mixed couple) started to promote among farmers grafting of high-quality fruit varieties on low-quality fruit trees to produce lucrative strains of mango, avocado and citrus in just two to three years. “Perhaps encouraged by lumber and charcoal barons, peasants were so suspicious of the sapling-bearing Finningans that they reported them as possible communist recruiters to the military. At the time, Haiti, just 45 miles from Cuba, was winding down a U.S.-backed campaign to suppress suspected leftists” (Tailor 2006).

## Summing up

The central elements emerging from this brief survey is that reforestation programs require an integrated approach (income generation, fuel alternatives, orchestrated strategy at the national level), political stability and international motivation to resolve the complex of problems.

In this frame AMURT seems to place itself quite well. What single organizations like AMURT can do is to implement integrated projects. There are other organizations active in Haiti that, judging from the material available on webpages, seem to operate in a sustainable way.

However, what these organizations cannot do is design concerted plans at the national level; what they cannot do is to operate in a climate of insecurity where international economic and cultural exchanges have been more or less intentionally hindered.

This is where bottom-up and top-down strategies blur into each other. Top-down here is not meant as imposition of projects from above, where the identification and solutions of problems all happens over the heads of the receivers. Rather, here "top-down" refers to the structures that concern those parts of the project that require a higher level of coordination. In this sense it becomes a cooperation between center and periphery that enables projects to succeed.

## 4 Conclusions

Development discourse emerged from the implicit assumption that the technological achievements and societal organizations of western civilization represent successes of humankind in inhabiting the planet, and should therefore be promoted among other cultures. The ecological threats of this time suggest the contrary. The fast rise of sustainability threats of this last century has been provoked by the exploitation of natural resources at an unsustainable rate and the mobilization of energy that had been stored over the course of million of years.

Natural resources have so far been treated as a well of unlimited depth. We are extracting resources faster than the well is refilling without paying for it. The strongest actors at the global level extract the most, far more than they actually need, and the weakest do not even have access to the well. Now the well is drying up. Our current economic models do not price the availability of the well's resources and regard the maintenance of the well not as positive investment that will eventually create more wealth but as an avoidable cost. The concept of growth in all its aspects (economic, population, etc.) is detrimental since it leads to a contradiction: the reality is that whatever we do, the planet cannot grow.

A substantial change in attitudes is therefore required to face the awaiting crisis. High ecological footprint citizens have to modify their way of looking upon life, so that the necessary reduction in consumption is not seen as a decline in living standards but rather as a switch in priorities; the substitution of quantity with quality, the enjoyment of immaterial satisfactions instead of products, the reevaluation of relationships over possessions. There are indications that this shift, far from impoverishing our existence, would actually enrich it. Anyhow, it is a must if we are to preserve civilization as we know it onto the next generations.

If the last century has been characterized by radical changes that have altered the habits of almost everyone on the planet; the century that just began needs to introduce an even bigger and faster revolution: new ways, new structures and new technologies.

Admittedly I am not very optimistic about the possibilities to win this race toward sustainability. But the alternatives are so gloomy that, in fact, there are no alternatives.

The major hindrance to the accomplishment of this project is the complexity of the global system; the erratic struggle between social, political, economical and ethical dimensions.

In times of scarcity, like the times we are entering, there is a higher risk for the rise of injustice in the fight over the control of resources. The challenge of this era is how to manage shortage of water, food and energy while facing population growth.

The struggle of development in this scenario is going to be the redistribution of power and rights. It will need to be accomplished through grassroots civic involvement and with the major task of monitoring global equilibriums and assuring the broadest participation in the control of wealth.

Communication plays a central role in the dynamic of transformations. The required climate is that of global awareness and local tuning into context. Indeed, local problems are more and more bound to be of a similar nature everywhere in the world, although painted with local nuances. And the way to solve them is also going to be related. Global problems, on the other hand, require cooperation. Exchange of information at all levels, local-local, global-global and local-global, is thus at the base of this process.

The interaction does not need to have preferential directions. It is not a matter of helping the others, but of helping each other.

The case of forests is representative of many other challenges. They well symbolize the reach of most of the current problems because their importance is evident at all levels; from the smallest scale of family economy with the products they can directly offer; to the national size through the effect they have on the environmental conditions; to the transnational level for the influence over the planet's climate, just to name some elements.

Therefore, it is clear that in order to tackle such problems, a strategy acting at all these levels is needed.

As shown by this particular study, the local, micro-reality of the Haitian village is just a part of the picture. What is required from the farmers, the behavior of planting trees, seems to be the easiest result to achieve. Much more difficult is the creation of national policies favoring the readjustment of the economy, the assurance of

political stability and the effective protection of natural resources; even harder yet is the balancing of international geo-political interests.

The positive outcome of the program at the local level seems to be due to the implementation approach. Technical solutions and models of positive behaviors are available and can be transmitted from one place to another, but the successful transfer of information and implementation at the local level depends upon the involvement of the resident population. Innovations can be *proposed* as answers to previously formulated questions but not *imposed* from above.

An analysis of the NGO communication strategy from a diffusion of innovations perspective revealed several positive points, such as the use of homophile change agents, the adaptation of messages to the audience and the characterization of the meaning of the innovation from a receiver's perspective. Nevertheless, the most important reasons for the success of the program rather seemed to sit in the NGO approach: the relationship of trust, the stability of its presence in the area and the intimate contact and cooperation with the local social structures.

As a more general observation, DoI as a communication model still exhibits some of the problematic elements that informed its origins. The entire classification of receivers according to their predisposition to adopt as well as the use of positive adjectives to characterize early adopters reveals a clear pro-innovation bias. In this study I have tried to demonstrate how problematic this stand point is. Even if I could not compare characteristics of different groups of adopters, because all the people I interviewed were early adopters, it was clear that the traditional classification did not hold in this context. In particular, factors such as education and socioeconomic status did not indicate any higher acceptance of the innovation.

A concrete example of interplaying levels and glocal parallels regards the perception of solar panels from two very different realities: Haiti and a small island outside Sardinia, S. Pietro, that I recently happened to visit. Sardinia needs electricity, as demonstrated by the fact that when in Italy there is a shortage of energy, Sardinia is one of the first regions to be subject to blackouts (as happened in summer 2003). The island has an abundance of sun and wind. However, none of these energies are exploited. Encouraged by the high level of acceptance found in Haiti I asked a few citizens in S. Pietro if they would consider solar panels. Amazingly the interest was very low. Among the reasons was the lack of technical expertise in the neighborhood (somebody that could install and repair), ignorance about technical possibilities, and also the belief that solar panels and especially wind mills are ugly. It really seems that the receivers' educational level, wealth, and so forth are playing a quite restricted role in this case. What may matter more is policy; this in turn is the expression of the will of the population. Furthermore, to formulate an informed judgment the population needs a clear and understandable body of knowledge, entailing some form of knowledge transfer. Once again communication is the key factor.

The strength of DoI research is that of a systematic study of this transfer of information. Once it is established that the change agents are not imposing solutions but responding to specific requests, a complete field appears that remains to be investigated: how local needs are understood by the innovation centers; how technical expertise is best communicated; how well the proposed innovation responds to the needs that it is supposed to satisfy; and, what social implications the diffusion of the innovation carries. In this sense, DoI does not need to be in contraposition with participatory models but can become a part of it.

To conclude, in the end of this journey I'm not sure that I made any step forward in the search for understanding; I still don't know what one should do to make a forest in Haiti. It is distressing to not have certainties about what is best; yes, to not have control. There is just a blurred skein of clues, of muddled words coming to mind: charcoal, political instability, poverty, donors, embargos; and no signs of where to start unraveling.

Or maybe the lesson is as clear as it gets. Maybe one just has to learn to accept that there are no prescribed ways, that the only possible thing to do is not to present solutions to the arena but to pose questions and let them generate thoughts, resolutions and actions.

"Trees are beautiful," the Haitian farmer told me. Deep inside we all know it, we all feel it. So the question to the arena is: why then are we cutting them?

# Appendix

## *Collected material*

### Interviews

In the following section I report the information gathered during the interviews as I understood and elaborated them. The content thus reflects the interviews opinions.

#### **Interview with the project coordinator Demeter Russafov (Dharma)**

The person. Member of the organization Ananda Marga, he's planning to become an acharya (spiritual guide/teacher and monk) and to dedicate his life to social service in disadvantaged countries. Originally from Bulgaria where he studied arts, he moved to US to complete his formation in environmental sciences and stayed thereafter. Three years ago, after cyclone Jeanne stroke Haiti, he sold his construction company, donated most of his possessions to AMURT and left the rest to his family. He's now based in Haiti where he volunteers for AMURT, working at the service of the people of Haiti, as he says.

AMURT in Haiti. The work of AMURT in Haiti started with education almost thirty years ago; there are now two schools and medical facilities in Port Au Prince. It continued with an emergency relief intervention immediately after hurricane Jeanne in 2004. AMURT spent half a year providing food to the people in the coastal villages. During that action, AMURT's volunteers saw the severe impact that the hurricane had in this area because of deforestation. Observing the sand storms, the dust balls sweeping in into the villages they realized that there was a huge need for a more constructive program focusing on development, starting from how the environment affects all other problems: infrastructure, water availability and so on. AMURT (Dharma) applied for a grant at an international aid agency which got approved. This initiated an intense activity in the rural area of Anse Rouges which includes both coastal and mountain villages. AMURT's current plans are to expand the base in the north (Sources Chaudes) which would allow a rapid intervention in case of natural disasters. Also in PauP there are plans to consolidate the settlement to be able to support urban based projects on environmental restoration, education and use of sustainable energies.

Integrated project. The first agronomist that was employed for the project, Celidon, is very open minded and experienced. He provided an important contribution. The project was planned around water rights. The water source in the village of TPlace provides water to the coastal villages; over the last 20 years the water table dropped consistently. The lack of water arose frictions between coastal and mountain villages and the lack of communication resulted in a situation of mistrust that eventually developed in vandalism and successive destruction of the water distribution system. This project tried to find an integrated solution tackling a cluster of problems together, not just giving trees without caring about the rest. Especially important was to facilitate a dialog among the villages and get them to cooperate.

Reforestation project. It started in small scale, at the beginning of the rain season June-July with the construction of a nursery. Some 2000/3000 seedlings of mango were purchased. The plants have now already been planted in people yards. There are three agronomists who are visiting communities also talking about water filtration, contacting village committees and stimulating the formation of working groups. It's a long term program, which is basically creating a seeds bank; seeds and tools were distributed to cooperatives that are now going to return the seeds derived from their own growing; and the nursery keeps on replanting seeds and making bags. In this phase the project focus on cash fruits, something that has economical value for people. There has not been an evaluation yet. It would now be needed an assessment looking at success and failure for these 3000 seedlings planted in order to prepare for a better distribution and planting of the next phase of the program. The nursery capacity will be 40000 trees every 4 month, now it reached approximately 20000. Then a new nursery will be made in Sources Chaudes.

Previously there were no other organizations planting trees in the area. Plants were just being cut except for some sporadic private action of owners planting in their own land. They were cut primarily to burn the wood for cooking and for carpentry. Because of the isolation of the region (the roads are in very bad condition) and

because of the climate (the soil is very poor), it is difficult to carry out programs in the north. Moreover, the government does not have a policy to protect trees.

Program introduction and organization. Alliances were built between AMURT and the existing structures so that the practical organization of the program was entrusted to village committees. The idea of reforestation was negotiated with the representatives of the villages. They were asked about what exigencies they had and reforestation was always one of them. Even if the education level is very low in the area, local leaders were aware of the problem of cutting trees and of the link between the dropping of the water table and deforestation. Trees are naturally associated with cash crops, food and monetary value. It is clear that trees bring value to the villages. It was easy to promote the program, people already had priorities in mind, so that at the first big meeting organized by AMURT where all villages in the area were invited, most communities were interested. The specific choice of which trees to choose was done by the agronomists according to the soil type and also according to the pre-existing experience of the farmers. Agronomist Celidon, who had previously implemented similar programs with other organizations, suggested the use of fruit trees since they would be better accepted by the farmers.

Evaluation. It is difficult to set measurable goals for this kind of programs. For example the water table rehabilitation is a very long term result. There is not a baseline data set prepared before the starting of the project. The measure taken into account in this preliminary phase is the production of the seedlings. Moreover, a database is built by continuously visiting the families, communities, tree stewards and check what is the success rate; trying to note who is taking good care of their trees.

Selection of adopters. Celidon planned the selection of beneficiaries, but it was not based on sociological data assessment as everybody is poor there so the economical level is quite homogeneous. The risk of increasing the social gap between richer and poorer has not been taken into account in the reforestation program but is probably very small. In other programs, like for example the rehabilitation of salt mines destroyed by cyclone Jeanne, there was an explicit policy of targeting the poorest owners. Moreover, the employment criteria of AMURT are always directed toward the neediest. In particular a gender sensitive approach is favoring the employment of women and their participation in programs and their involvement in decision making.

Communication strategy. Communication is based on interpersonal channels. The message is directly communicated by the agronomists to the farmers. Agronomists are doing meetings with villages and also do house to house visits on a regular base. The fact that agronomists and farmers come from a different background, can in principle cause difficulties in transmitting information because of the etherophily, but the gap is somehow decreased because of the strong connection that AMURT creates with the local population. Dharma has been to many meetings, building a mutual understanding from the grassroots. He never felt that the local people perceived them as strangers, probably also thanks to the approach of the people that AMURT hires. It is a very small organization, with lots of problems that people can see, at the material level; cars are broken most of the times, the accommodations are basic, AMURT is borrowing moneys from locals. When you get to a village and people see you pushing your car into a meeting, they identify with your trouble. People also know that AMURT is a volunteer organization, the staff lives in the villages, in a very isolated set, without energy and comforts. In big organizations the practice is different; one person visits the village for 15 minutes and then goes back to the capital. AMURT has been living in the village now for one year, the relationship is very intimate. There is constant frequentation with all the committees in the villages, there is friendships, sharing of the problems and tuning with the needs. Local people do not look at AMURT staff like strangers. Every thing AMURT does is because it was required.

Involvement of opinion leaders. There is a strong link between AMURT and committees. Opinion leaders are definitely involved in the promotion of the information. The relationship between committees and population depends on the village though. In some places, the committees are democratically elected and everybody participates in their meetings. In others this is less the case; committees were not elected very well, they were already formed before AMURT's intervention and the relationship with the citizens is less strong. In those cases an additional effort is made to find ways to handle conflicts.



Figure 34. On the left: project coordinator Dharma. On the right: agronomist Celidon

### Interview with agronomist Celidon

The person. Agronomist worked as a freelance consultant for AMURT since the beginning of the project. Originally coming from the near town of Gonaives, has been working for other international organizations before, like Haiti Gardens, and before that with CARE. He has competencies about all aspects of the agricultural system: reforestation, crops, animals and irrigation.

Reforestation program status. Up to now a nursery has been built in TPlace, mainly for fruits trees, mango, avocado, papaya, but there are also forests trees and vegetable seeds. The villages that have been involved up to now are: Source Chaudes, TPlace, AtDimanche, Figuet, Bonal, L.aRobe', PointDesMangues, PacMelon, LesOrangesPlan, RivierFroide, GranSavan, Corridon PetitCarenage and GranCarenage.

Implementation strategy. The contact happens through the village leaders. Then a meeting is organized with the complete population and things are discussed. AMURT asks for what problems there are in the village and people spontaneously express their opinions which are noted down. The demands are then evaluated, reforestation and drinkable water are normally the first problems tackled. The kind of trees is chosen with the participation of all the peasants that have land, especially the elders. Practically, in a successive encounter, the team of technicians trains the committee, working together in a first trial. In this session the terrain is prepared mixing compost, brought by AMURT, with soil. Then the committee, or the "most intelligent"<sup>17</sup> persons in the group, will be able to promote in the village and teach others who will learn with practice. Most intelligent is intended as those most interested and who understands fastest; the ones more open, who get engaged in the project because they love it and put more time in it to learn and continue the job. There are always some more "negligent"<sup>18</sup> individual, but they are encouraged by the others.

Selection of adopters. Each village committee decides who will have the plants; the technicians are going around with the committee, find the places where the plants will be placed and prepare the holes. The difference in income between the farmers is irrelevant. Everybody in these villages is poor, especially after cyclone Jeanne.

Communication strategy. Everybody is interested in the programs. Before this project there were no other initiatives going on in the area, so it was not possible to get trees anywhere near. People are therefore very happy to cooperate with AMURT. Trees are priced because they provide freshness and fruits. Just the people who have the land (the others just have some animals) are actively participating in the program, but everybody is nevertheless interested. This project brings economical advantage to the farmers. Even the forest trees are valuable; they give shadow, improve the environment, and also provide building material. The peasants

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<sup>17</sup> Interviewee expression

<sup>18</sup> ibid

understand that and they applaud the work of AMURT. Some farmers do know about how natural systems work but not all. For example in AtDimanche, there is another nursery, the population in copartnership with AMURT took a piece of land and did plant trees. The action was pushed by local knowledgeable people that had had training with another NGO previously. They know how to prune, to graft. Otherwise AMURT does seminars talking about reforestation and the importance of trees and of irrigation for the trees. The project is always well accepted; actually people are waiting for it.

Evaluation. The evaluation is done after one or two months, with the farmers, going back and checking. It was found a percentage of loss between 2 and 5 %. The data on the plants that have been distributed and the percentage of those who died is reported in Table 2. The percentage of plants who survived is quite high.

### **Interview with agronomist Gilbert**

The person. Agronomist coming from the plateau of the Artibonite, which is a slightly richer area, naturally more preserved, located higher in altitude and inland. He's working for AMURT since three months with the responsibility of the nursery in TPlace and also the task of promoting awareness among the public about reforestation and sustainable agriculture issues. The training for school teachers regards the functioning of natural systems, specific notions about the local environment, reflections in relation to its degradation and critical assessment of its causes. Leaflets in Creole are provided to the teachers as a base to build lessons for their students. The students are in their turn taking back this knowledge to their families; their parents listen to them since they keep the school in high esteem, says Gilbert. He also organizes meetings in each locality to talk about the importance of water purification and does formation for the users of bio-sand filters for water purification.

Reforestation project. The trees are ready to be delivered to the farmers three months after they have been planted. During the distribution the agronomists explain how to plant. After 2-3 weeks they go to visit the land and check how many survived and distribute other plants to substitute the ones that died. The selection of the farmers was based on who had the land; farmers were invited to the information meeting and all invited came.

Communication. The educational material for farmers is different from the one prepared for teacher and students, it is more practical. The language is Creole and therefore comprehensible for the farmers. Nevertheless, sometimes farmers are not interested in learning about environmental threats, so there are strategies to catch their attention. For example, the lessons are provided during plant distribution: people then are more predisposed to listen since they are rewarded afterwards with the plant. The explanation concerns how to plant and more in general, the conservation of the soil, how to isolate the space, how to make bags of compost, at what distance to plant and so forth. To attract even the most difficult farmers one has to offer something; can be plants or seeds. If there is nothing to offer, organize a lunch, or promise to talk about irrigation plans. A better strategy to involve the farmers would be to go through ODD, the organization for the development of agriculture which is present in the area where Gilbert comes from. There are specific days when the organization members meet to discuss various issues. Formation would be better done through these natural moments of encounter. But in this area things are just starting, it takes time to organize.

Adopters characteristics. The most open people to receive information, the ones who listen carefully, are those who go to church, who have education; this is due to the fact that they can relate to something they know. The ones who speak a very basic Creole, never went to church or school, do not have the habit to learn and they will therefore listen passively. Analphabets are hard to teach. It would be needed alphabetization classes. The message would pass more easily. The richness factor is not very relevant. In this region the nature is so degraded that the cultivation does not bring enough products. The area is deserted, there is no water and not enough food is produced. There is no job. There are some "rich" people but the majority is poor. The most miserable maybe have some place to live but not the land to work.

Gender. The receivers are both men and women, but usually guys are working in the fields and women collect the products and sell at the market. Often is the woman who comes to the courses since the man, being in the fields, does not have the time. She will transfer the message without problems. In the nursery women are preparing the compost in small bags. They get a small salary which is nevertheless a good help for their

families. Four men are then taking care of the planting and following the growth of the seeds to the time of distribution.

#### **Interview committee member Veve'**

The number of plants to distribute to each farmer who would want to participate in the project was calculated according to how much land s/he had.

#### **Interview with the judge of Sources Chaudes, Rene Pierre Charles**

The person. Born in Sources Chaudes, studied primary school in Figuet, then secondary school (scientific lyceum) in Gonaives and after that tele-communication for four years in Port au Prince. Finally he went to law school and he's now appointed as justice of the peace at the tribunal of Sources Chaudes. He's participating in the seminar for school teachers about pedagogy and the environment, to monitor AMURT's works as a local authority. He's the composer of the song about the nature that opens the seminar.

The song. It was composed on the occasion of cyclone Jeanne that did hit people and animals in 2004, as a testimony for future generations. The song talks about the natural disaster, it mentions erosion which was the major cause for destruction, saying that the fertile land has been washed out into the sea. It has been written to stimulate the participation of people to start a campaign to plant trees and protect the nature. It is the first time that the song is used and with AMURT's help it will be spread to people. Songs are a good way to transmit messages in Haiti, to involve people to participate and be conscious of their environment. All Haitians love to sing, in bad and good situations Haitians are singing. During the white colonization, before the independence revolution in 1804, blacks used songs to fight against slavery. It is not the only answer, but through it one can suggest actions that can solve the problem. It works as stimulus, encouragement.

#### **Interview sociologist Prof. Philippe Claude Université Quisqueya**

The roots of the deforestation phenomenon. The destruction of the woods is linked to economical reasons since it is done to produce charcoal. In order to avoid deforestation it is necessary to find feasible economical alternatives. Deforestation is not done for vandalism or bad will, but for necessity. It would surely be possible to stop deforestation if resources would be available. For example an alternative to the use of plant carbon, could be mineral carbon. To cure the sickness it is necessary to start from the cause not from the effect. So it is necessary to identify the fundamental problems behind deforestation and find alternative remunerations.

## Tables

Table 1. Semi- structured interview mall

Points	Questions
Interviewee background	Could you please introduce yourself
Project description Location Preexisting situation targeted social system temporal time schedule invested resources action plan measurable goals	Could you spend a few words describing the project. Which are the interested areas? What was the preexisting situation? Who are the receivers of the plants? When did the project start and when is it going to end? How much is the cost? What has been the strategy? What steps? Information..... Are they any measurable goals?
Rate of adoption factors Innovation characteristics relative advantage compatibility trialability observability re-invention cluster Sense of ownership	Were the proposed practices fruitful for the receivers? How is this innovation perceived? Economic advantage? Prestige? Were they compatible with preexisting habits? Previous experiences? What's the indigenous knowledge about trees? Were the strategies of the project modified in any way according to local suggestions? The very objectives? Were the innovations introduced as a cluster, do you think targeting different goals separately would have been more efficient?  Was the program implemented according to participative methods? Did this help the acceptance? Do you think this had an impact over the future sustainability of the project? How were the participants selected? Who chose the kind of plants?
Communication channels mass media/ interpersonal Degree of homophily with the receivers opinion leaders diffusion networks (radial/interlocking)	What kind of communication strategy is adopted?  How were the people selected for the courses? Who were the teachers? Which characteristics?  Involvement of opinion leaders.  Would the information travel from change agents to population or was the spreading among peers?
Consequences Social gap gender	Is the project helping the poorest? Was the repartition fair? How was the social stratification of the community before and after? Were targeted campaigns designed on purpose for the poor?  Was the gender perspective taken into account? How was the acceptance?

Table 2. Survival of distributed plants, from agronomist Celidon

Village	mango	coconut	lemon	kachiman	% of dead plants
<b>Figuet</b>	<b>160</b>	<b>60</b>	<b>50</b>		<b>2</b>
<b>LaRobe</b>	<b>130</b>	<b>39</b>	<b>25</b>		<b>3</b>
<b>TPlace</b>	<b>320</b>	<b>120</b>	<b>27</b>		<b>5</b>
<b>Bonal</b>	<b>30</b>	<b>30</b>	<b>25</b>		<b>2</b>
<b>PacMelon</b>	<b>100</b>			<b>50</b>	<b>3</b>
<b>GrosKayac</b>	<b>130</b>	<b>30</b>			<b>0</b>
<b>AtDimanche</b>	<b>100</b>	<b>30</b>			<b>0</b>
<b>GrandKay</b>	<b>100</b>				<b>0</b>

Table 3. Song « the ripped nature » written after hurricane Jeanne by Rene Pierre-Charles, Judge of Sources Chaudes

<b>Lanati dechire'</b>	<b>The ripped nature</b>
<b>Ewozyon tribo' babo'</b>	<b>Erosion every where</b>
<b>Tout bon te' nou pati</b>	<b>All our good earth washed away</b>
<b>Nan inodazion</b>	<b>With the inundation</b>
<b>Al chita non lamne'</b>	<b>Went to deposit in the sea</b>
<b>Nam bafon lamne'</b>	<b>On the bottom of the sea</b>
<b>Ke'</b>	<b>Chorus</b>
<b>Nape plante pye bwa</b>	<b>We will plant some trees</b>
<b>Poun ka sove Ayiti</b>	<b>To rescue Haiti</b>
<b>Nape plante pye bwa</b>	<b>We will plant some trees</b>
<b>Pou la nati fleri</b>	<b>For the wounded nature</b>
<b>Na konseve te' a</b>	<b>We are going to preserve the earth</b>
<b>Ab fritye ka donne</b>	<b>The trees can give fruits</b>
<b>Zan nimo ka grandi</b>	<b>The animals can grow</b>
<b>Nam bel bel nati fleri</b>	<b>The very very beautiful wounded nature</b>
<b>Lala, lala o Jan!</b>	<b>Lala, lala oh Jeanne!</b>

Table 4. Set of questions for the semi survey inspired to Rogers' theory

<b>Adopter Characteristics</b>	
	<b>Age and gender of the stakeholder</b>
<b>Economic status</b>	<b>Land extension</b>
	<b>Do you own your house?</b>
	<b>Do you have animals? how many?</b>
	<b>How is the family composed?</b>
	<b>Do you have a social role?</b>
	<b>Do you grow charlotte?</b>
	<b>Do you sell at the market?</b>
	<b>Do you sell animals at the market too?</b>
	<b>Do you have relatives abroad? Where?</b>
	<b>Do you have cars? Nr.</b>
	<b>Other income?</b>
<b>Education</b>	<b>Educational level</b>
<b>Genetic factors</b>	<b>How did you get the land?</b>
	<b>For how long have you had the land?</b>
<b>Ambition</b>	<b>Are you planning to buy more land?</b>
	<b>Are you planning to buy animals?</b>
	<b>Are you planning to get more plants?</b>
<b>Mass media exposure</b>	<b>Do you have a radio?</b>
	<b>Kids in school? Which?</b>
	<b>Church?</b>
<b>Cosmopolitaness</b>	<b>Where are you from?</b>
	<b>And your wife?</b>
	<b>Do you travel a lot?</b>
	<b>Where?</b>
	<b>Have you ever been outside Haiti?</b>
<b>Exposure to change agents</b>	<b>How many times were they in contact with the change agents?</b>
<b>Farmers perception of the innovation.</b>	<b>From whom did you get the info?</b>
	<b>What did they say you should do?</b>
	<b>Why?</b>
	<b>Was the explanation clear?</b>
	<b>Who in the family brought the info?</b>
<b>Rate of adoption</b>	
	<b>How many plants were distributed?</b>
	<b>When?</b>
	<b>How many survived?</b>
	<b>If not all why?</b>
	<b>Would you be interested in forest trees?</b>
	<b>Reinvention. Any sing of reinvention?</b>
	<b>Cluster. Are you involved in any other initiative with AMURT?</b>
	<b>Did you know AMURT from before?</b>
<b>Networks</b>	
	<b>When did you first hear about the project</b>
	<b>From whom</b>
	<b>Did you talk about this project with your friends?</b>

Table 5. Data grouping

Gender	
<b>Male</b>	0
<b>Female</b>	1
Age	
<b>20-40</b>	1
<b>40-50</b>	2
<b>50-60</b>	3
<b>60-70</b>	4
<b>70-80</b>	5
Economic	
<b>Sells crops at market / Goat, pig, sheep &lt; 10, or small land</b>	1
<b>Goat, pig, sheep &gt; 10, donkey / Sells animals at market</b>	2
<b>Cow, horse</b>	3
<b>Has other income</b>	4
<b>Has relatives abroad</b>	5
Education	
<b>No school</b>	1
<b>Elementary ≤ 1 years</b>	2
<b>Elementary ≤ 3 years</b>	3
<b>Elementary &gt; 3 years</b>	4
<b>Secondary</b>	5
Social role	
<b>No role</b>	1
<b>Member of a group/ public function</b>	3
<b>Leader</b>	5
Exposure to media	
<b>Kids in school</b>	1
<b>Goes to church</b>	3
<b>Radio</b>	5
Cosmopolitness	
<b>Born and raised in the neighborhood</b>	1
<b>Not born in neighborhood</b>	2
<b>Yearly travel to town</b>	3
<b>Monthly travel to town</b>	4
<b>Relatives abroad</b>	5
Knowledge of AMURT	
<b>Heard about it</b>	1
<b>Knows 1 program</b>	2
<b>Knows ≤ 3 programs</b>	3
<b>Knows &gt; 3 programs</b>	4
<b>Worked for AMURT</b>	5

Table 6. Collected data

Village	Date - 2005	Age	Gender	Number of family members	Land extension hectare	Economic	Education	Social role	Media exposure	Contact with agents	change	Cosmopolitnness	Plants	Survival %	Months from distribution	Knowledge of AMURT
AtDimanche	01/12	70	0	12	1.5	4	3	5	5	10	3	4	100	1.5	19	
AtDimanche	01/12	50	0	12	1	3	4	1	1	2	4	38	100	1.5	2	
GrosCayac	14/12	52	1	10	2	2	1	1	1	10+	1	2	100	6	5	
GrosCayac	14/12	65	0	13	1.5	2	4	3	5	10+	1	3	30	6	5	
LaRobe	14/12	25	1	8	0.012	2	3	1	3	7	1	-- <sup>20</sup>	--	--	3	
LaRobe	14/12	78	0	10	1.024	5	2	1	3	7	5	2	50	4	3	
TPlace	14/12	42	1	6	0.02	1	1	2	3	10+	3	6	50	6	5	
TPlace	14/12	50	1	5	0.04	5	2	1	3	10	5	4	50	6	5	
TPlace	14/12	64	0	15	5	5	4	5	5	10+	5	15	87	7	5	

<sup>19</sup> The question was included afterwards

<sup>20</sup> She received seeds.

## ***Biological roots of risk taking and pro-adoption behaviors***

The first extract is from the English science journalist and writer Matt Ridley about findings in genetic sciences according to which risk taking behavior would have a genetic component.

Researchers have identified a gene D<sub>4</sub>DR that comes in different sizes in different people and found out that people with either one or two long copies of the gene were distinctly more novelty-seeking than people with two short copies of the gene. A related curiosity is that according to these findings, among people with long D<sub>4</sub>DR, heterosexual men are six times more likely to have slept with another man; homosexual men are five times more likely to have slept with a woman and all have more sexual partners than the short-gened people.

Regrettably, nobody asked the Iowa farmers back in the 1950s about their sexual preferences and habits since, apparently, that would have been a more indicative parameter to judge their innovativeness than education or social status.

The second extract is from Portuguese neuroscientist and writer Antonio Damasio and it illustrates the relation between different behaviors (risk taking in this case) and the different physical condition of the subjects' brains. In the gambling experiment, based on a card game, people that suffers a damage in a particular area of the brain, show anomalous risk taking behavior (but do not reveal other malfunctions) in comparison with a test group. Attracted by high rewards and not discouraged by even higher losses, they continue to pick cards from a deck doomed to make them loose, while the control group subconsciously learns the lection and picks from the other decks. In a follow up experiment, it was possible to show that normal people generate a response (detectable by measuring the skin conductance during the experiment), in anticipation of the risk event of turning the card from a bad deck and this response increases in intensity with the accumulation of negative experiences. This seems to be a natural mechanism to signal danger. Patients, on the other hand, did not have the signal mechanism. This implies that behavior correlates with physical traits and is not just influenced by education or environmental factors.

The third extract recalls a long term study first published by Japanese ethologist T. Kawamura in the early fifties on wild Japanese macaques, a species closely related to humans. The observations made showed how innovative behaviors introduced by one element of the group spread to other members through family lineage and playmate relations. According to the study the age and gender of the monkeys clearly played a determinant role in the propensity to adopt.

### **From Ridley, in *Genome*, Chapter 11, Personality**

“On the short arm of chromosome 11, there lies a gene called D<sub>4</sub>DR. It is the recipe for a protein called a dopamine receptor, and it is switched on in cells of certain parts of the brain but not in others. Its job is to stick out of the membrane of a neuron at the junction with another neuron (known as synapse), ready to latch on to a small chemical called dopamine. Dopamine is a neurotransmitter, released from the tips of other neurons by an electrical signal. When the dopamine receptor encounters dopamine, it causes its own neuron to discharge an electrical signal of its own. [...] Dopamine pathways do many things, including controlling the flow of blood through the brain. A shortage of dopamine in the brain causes an indecisive and frozen personality, unable to initiate even the body's own movement. In the extreme this is known as Parkinson's disease. [...] An excess of dopamine in the brain, by contrast, makes a mouse exploratory and adventurous. In human beings, excessive dopamine may be the immediate cause of schizophrenia; and some hallucinogenic drugs work by stimulating the dopamine system. [...] A rat in which this pleasure system (a spot in the brain) is stimulated whenever he presses a lever will learn to return to press the lever over and over. But if a dopamine blocking chemical is added to the rat's brain, the rat quickly loses interest in the lever. [...] to simplify grossly, dopamine is perhaps the brain motivation chemical. Too little and the person lacks initiative and motivation. Too much and the person is easily bored and frequently seeks new adventures. [...]

D<sub>4</sub>DR has a variable repeat sequence in the middle, a minisatellite phrase forty eight letters in lengths, repeated between two and eleven times. Most of us have four or eleven copies of the sequence, but some people have two, three, five, six, eight, nine, ten or eleven. The larger the number of repeats, the more ineffective is the dopamine receptor at capturing dopamine. A “long” D<sub>4</sub>DR gene implies a low responsiveness to dopamine in certain parts of the brain, whereas a short D<sub>4</sub>DR gene implies a high responsiveness. [...]

Hamer measured the novelty-seeking character of 124 people on a series of set personality tests and then examined their genes. [...] People with either one or two long copies of the gene (*six or more repeats*) were distinctly more novelty-seeking than people with two short copies of the gene. [...]

People with “long” D<sub>4</sub>DR genes have low responsiveness to dopamine, so they need to take a more adventurous approach to life to get the same dopamine “buzz” that short-genet people get from simple things. [...]

Hamer went on to demonstrate a striking example of what it means to be a novelty seeker. Among heterosexual men, those with the long D<sub>4</sub>DR genes are six times more likely to have slept with another man than those with the short genes. Among homosexual men, those with the long genes are five times more likely to have slept with a woman than those with the short genes. In both groups, the long-genet people had more sexual partners than the short-genet people. [...]

Hamer estimates that novelty-seeking is about forty percent heritable”

## **From Damasio, in *Descart’s Error*, Chapter 9, Testing the somatic marker hypothesis.**

### **The gambling experiments.**

“In the basic experiment, the subject, known as *the Player*, sits in front of four decks of cards labeled A, B, C and D. The player is given a loan of \$2000 [...] and told that the goal of the game [...] is to loose as little as possible of the loan and try to make as much extra money as possible. Play consists of turning cards, one at the time, from any of the four decks, until the experimenter says stop. [...] Neither the amount of gain or loss in any card, nor the cards’ connection to a specific deck, nor the order of their appearance is disclosed at the outset. [...] The turning of any card in the decks A and B pays a handsome \$100, while the turning of any card in decks C and D only pays \$50. Cards keep being turned on any deck, and quite unpredictably, certain cards in decks A and B require the Player to make a sudden payment, some times as much as \$1250. Likewise, certain cards in decks C and D also require a payment, but the sums are much smaller, less than \$100 on the average. [...]

What regular folks do in the experiment is interesting. They begin by sampling from all four decks, in search of patterns and clues. Then, more often than not, perhaps lured by the experience of high reward from turning cards in the A and B decks, they show an early preference for those decks. Gradually, however, within the first thirty moves, they switch their preference to decks C and D. In general, they stick to this strategy until the end, although self professed high risk players may resample decks A and B occasionally, only to return to the apparently more prudent course of action. There is no way for players to carry out a precise calculation of gains and losses. Rather, bit by bit, they develop a hunch that some decks - namely A and B - are more dangerous than others. [...]

The behavior of ventromedial frontal patients in this experiment was most informative. What they did in the card game resembled what they often have done in real life since they sustained their brain lesion, and differed from what they would have done before the lesion. Their behavior was diametrically opposed to that of normal individuals. After an early general sampling, the frontally damaged patients systematically turned more cards in the A and B decks, and fewer and fewer cards in the A and D decks. Despite the higher amount of money they received from turning the A and B cards, the penalties they kept having to pay were so high that half way through the game they were bankrupt and needed to make extra loans from the experimenter. [...]

Patients with large lesions elsewhere in the brain [...] can play the gambling game as normals do provided they can see and can understand the instructions. [...]

A normal follow up to the gambling experiments was [...] to monitor the performance of both normal subjects and those who had frontal damage, with skin conductance responses during gambling tasks. [...]

The first batch of results yielded a striking profile. Both normal controls and frontal lobes patients generated skin conductance responses as each reward or punishment occurred after turning an appropriate card. [...]

Within a number of card-turns into the game, something quite intriguing began to happen in the normal subjects. In the period immediately preceding their selection of a card from the bad deck, that is, while the subjects where deliberating or had deliberated to pick from what the experimenter knew to be a bad deck, a skin conductance response was generated, and its magnitude increased as the game continued. In other words the brains of the normal subjects were gradually learning to predict a bad outcome, and were signaling the relative badness of the particular deck before the actual card turning. [...On the other hand,] the patients showed no anticipatory responses whatsoever, no sing that their brains were developing a prediction for a negative future outcome.”

## **From Matsuzawa, in The Ai project: historical and ecological contexts. Study of wild Japanese monkeys since 1948**

In 1948 professor Kinji Imanishi (1902.1992) set off with two of his students, Shunzo Kawamura (1924.2003) and Jun'ichiro Itani "to Koshima Island where they were to begin a long-term study of wild Japanese macaques. [...] Among the numerous findings of Imanishi's team, the best known is the cultural propagation of sweet-potato washing. Sweet-potato washing (SPW) is a behavior in which monkeys take a sweet potato to the edge of the water and wash the sand off it with water. This behavior was first seen in the summer of 1953, performed by a female named Imo ("potato" in Japanese) who was 1.5 years old at that time. [...] The SPW behavior gradually spread to other members of the community. The first 5 years' records show that the acquisition rate in adults more than 8 years old was only 18% (2 out of 11). Both were females. None of the adult males ever performed this practice. The rate in young monkeys aged between 2 to 7 years old was much higher: 79% (15 out of 19) acquired the behavior. After that, most newborns began to show SPW behavior. In sum, the younger generation was sensitive toward the new invention, while adults rarely adopted the behavior. The propagation process was clear, involving two main channels: through kinship and through playmate relations. In the 4th year following the invention, ten individuals including Imo performed the SPW behavior. One route of transmission was along the family line: after Imo's invention, the mother (Eba) adopted the SPW behavior in the same year. Imo's brother, Ei, younger by 2 years, took up SPW at the age of 1.1.5 years. The other route led to Imo's playmates. All seven remaining individuals were Imo's playmates, no more than a year younger or older, and acquired the skill at the ages of 2.5 years. These data also suggest a critical period for learning SPW. The SPW behavior became fixed in the troop during the years 1958.1959. By this time almost all infants were acquiring the skill. [...]

Kawai and his colleagues conducted intensive follow up studies. [...]

An interesting case was that of "pool-making", which was especially efficient for WPM behavior. When grains of wheat remained scattered on the beach while it was still wet at low tide, some monkeys dug into the sand, creating small pools from the water that oozed up. They then dipped a piece of sweet potato or swept nearby grains of wheat into the pool before consuming them. Cultural innovations thus continue to emerge.

[...] Long-term study at Koshima still continues. It is now in its 6th decade, and has recorded the history of eight generations of wild monkeys (Watanabe 2001, personal communication). None of the monkeys who experienced the emergence of these particular cultural behaviors are alive at present. However, their descendants are still dipping sweet potatoes into the sea, and throwing grains of wheat into the water. The behaviors have been transmitted over several generations".



Sweet-potato washing. Japanese monkeys on Koshima island take a potato to the edge of the water and wash the sand off it. This behavior began in September 1953 by a female named Imo (meaning "potato" in Japanese), 1.5 years old at the time. The behavior gradually spread to the other monkeys (Photo by K. Watanabe)

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