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Certificate Thesis

THE SUSTAINABLE DEVELOPMENT PARADIGM SHIFT:

FINANCING A LONG TERM VISION IN THE AMAZON RIVER BASIN

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"The adoption of long term planning methodologies will be crucial for the future of multilateralism"

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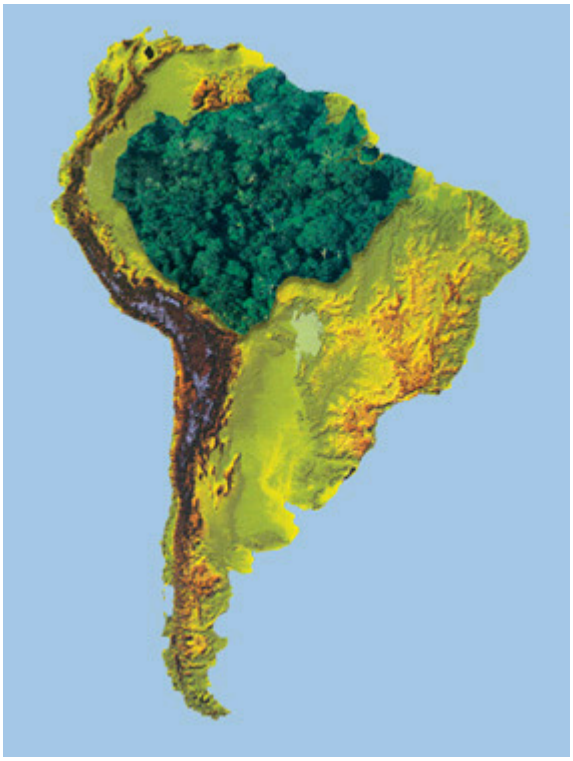

Case Study: Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin considering Climate Variability and Change.

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GEF Amazonas Technical Coordinator's Foreword

The concept of Sustainable Development is not an intellectual sophism of our beginning XXI Century, but the result of serious environment and social-economic problems that humanity is facing. The world, in a rapid process of globalization and economic integration clearly perceives the limits of the natural resources of the planet. And, most important, we perceive that the *principles* and the *manner in which* this worldwide integration occurs, produces disastrous collateral effects, such as environmental impacts of planetary dimensions, climate change, increasing levels of social injustice, wars and an growing voracity for natural resources to sustain economic growth. The perception of these limitations of the global economic model leads us to a very basic question: how to face the future of humanity? Or in other words: does our model of *development* have a future? The answers, however, are not simple and require new analytical approaches based on interdisciplinarity, breaking with our positivist and linear traditions of thinking. The human society is a *complex* system, far from equilibrium and conducted by parameters that do not obey the traditional logics of mechanistic sciences. This is the reason why understanding the concept of *sustainable development* requires an understanding of the real meaning of complexity, which is a key aspect of the innovative character of the concept of Sustainable Development and so far a driving force of the paradigmatic shift.

Concepts like Sustainable Development are not invented by capricious scientists; they arise from new horizons of general perceptions *against* established paradigms which is what this paper intends to discuss. The author focuses on two important issues: (i) the theoretical discussion and (ii) the practical example of a project, localized in one of the world's most sensitive and greatest reserves of natural resources, the Amazon Basin.

A specific aspect of the present analysis should be highlighted: "Sustainable Development *is* the Economy, which in turn can be more or less sustainable" (p.23). There is the key element of the discussion and the most powerful obstacle for political change. Going deeper in this direction of analysis and looking beyond the great concepts of *Economy* and *Market* we easily will discover the real content of the *Pandora's Box*: the ghost of virtual economy. Very powerful economic actors are "producing" *Money* from *Money* by gigantic processes of speculation and gambling, losing complete relation with the world of material production and consumption and so far to real life of human beings. Humanity became a hostage of financial speculation.

On the other hand, Sustainable Development only can make sense if it means development of welfare, better distribution of economic profits, peace and more intelligent use of our limited natural resources.

In conclusion we can say that the concept of Sustainable Development is the ultimate *expression* of a deep paradigmatic shift not only in sciences, but in all aspects of human life which puts the globalized humanity at a bifurcation with widely unpredictable outcomes. But the fact that Sustainable Development is becoming a worldwide subject of concern (even in Davos) is at least a good sign for our future.

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INTRODUCTION

THE AMAZON PARADOX

"Despite being the world's greatest patrimony of biodiversity and sweet water resources with a wealth of natural riches of all kinds, the Amazon Basin is populated by communities whose living conditions remain below those of communities elsewhere in the sheltering countries. This places growing political pressure on national governments not only to deal with the economic and societal complexity of the Basin but also with the environmental challenges of the region. It is the environmental issue that has captured worldwide attention and contributed to external (global) pressures on the national governments to preserve the Amazon Basin. This, in turn, has exacerbated socio-economic tensions within the Basin, where the Amazonian society is legitimately seeking to utilize the natural resource base for economic purposes."[1]

Many systems work together to keep the Earth's water moving in a cycle. There are five processes at work in the hydrological cycle: condensation, precipitation, infiltration, runoff and evapotranspiration[2]. These occur simultaneously and, except for precipitation, continuously. Because much of the solar energy received by the Earth is used to drive the hydrological cycle, rising global temperatures (through higher levels of solar energy trapped in the atmosphere) will lead to an intensification of this hydrological cycle, resulting in changes in precipitation patterns (dryer dry seasons and wetter rainy seasons), subsequently increasing the risks of more extreme and frequent floods and drought. Changing climate will also have significant impacts on the availability of water, as well as the quality and quantity of water that is available and accessible. Melting glaciers will increase flood risk during the rainy season, and strongly reduce dry-season water supplies to one-sixth of the World's population[3].

Access to water plays a key role in development – it sustains human life, both through direct consumption and use in agriculture (for food security) and industrial activities. While water availability for drinking purposes is essential, it cannot be separated from wider water resource management issues. Its use for industrial purposes is important to fuel economic growth, and competing demands from households, agriculture and industry are a source of conflict over water availability and use. Today, more than one billion people still lack access to safe water, while over two billion lack safe sanitation[4]. The changes to the hydrological cycle will deteriorate the availability of water for human populations[5], in terms of quantity, quality and accessibility of water supplies. These conditions will be further exacerbated by increasing natural disasters and their impacts on water for human populations.

The Global Environment Facility's (GEF[6]) International Waters focal area is about to launch a multi-stakeholders project entitled "Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin considering Climate Variability and Change" (GEFAM). The project's objective is to elaborate a Strategic Action Program (SAP) through specifically-identified issues that form the nexus between climate change adaptation and transboundary water and land resources management, while creating the necessary enabling socio-economic environment for its implementation. The project total

[1] "Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin considering climate variability and change", Intercessional Work Program Inclusion, GEF (IWPI), June 2007.
[2] Nasa Observatorium, Hydrologic Cycle, http://observ.arc.nasa.gov
[3] Stern Review Report, "The Economics of Climate Change", 2007.
[4] "Climate Changes the Water Rules", Kabat, van Schaik & Appelton, WaterandClimate, 2003.
[5] "Climate change & water resources", Jim Holmes, WaterAid, 2007.
[6] The GEF is a multilateral financial organization that provides grants to developing countries for projects that benefit the environment and promote sustainable livelihoods in local communities.

timeline is twelve years and this is a first four-year phase to be followed by another two four-years phases[7].

While many other development interventions are taking place within the Amazon River Basin, to mitigate environmental and social impact of ongoing development processes, these efforts have been launched with little reference to three important factors. Primarily, they have ignored the fact that the Basin forms a single hydrological system crossing national boundaries and forming an essential element of the global circulation cycle. Consequentially, actions have not taken place within a coordinated multilateral framework allowing for minimization of environmental impact, while supporting human activity and national goals consistent with the international obligations of the governments; neither have they taken into account the legitimate needs and aspiration of the basin's population for economic and social development.

As the only multilateral financing mechanism available for long term sustainable development interventions, GEFAM plans to respond to these shortcomings by looking at reconciling competing resource uses and formulate agreed actions by the Basin's governments and their communities in order to resolve shared transboundary concerns. This will include three central axes, the first one being geared towards understanding the Amazonian society and building a shared Vision, the second one towards understanding the Amazon resource base through a scientifically-sound and technically appropriate environmental assessment, and finally the development of response strategies incorporating experiences gained through a number of targeted pilot projects.

The paper will start by explaining the many, interconnected and transboundary challenges of sustainability facing the Amazon River Basin, which is simultaneously witnessing socio-economic exponential growth and migratory flows from various origins. It will argue that in order for the project to prepare an adequate SAP, it is necessary that the Basin stakeholders previously develop a long term shared Vision of the Basin.

In a second phase, the paper will present the scenario methodology as a well fitted long term planning tool for building such a Vision in a participatory way, given the level of complexity and the rate of change in an environment facing a high degree of uncertainty. It will argue that such a scenario planning exercise is the most efficient way towards building the public/private partnerships that the SAP will require as well as creating a solid base for formulating an accompanying financial strategy.

Finally the paper will briefly try to understand why, after two decades of the World Commission on Environment and Development report calling for the development of long term environmental strategies, greater cooperation between countries, and the definition of long term shared perceptions of environmental issues, it is still linear thinking that has dominated mental models used for critical decision making in most institutional governance structures - multilateral ones in particular. It will argue that it is the lack of applied systems thinking tools within these institutions that has prevented the necessary restructuring that would allow them in turn to invest in the development of longer term visions and strategies, which the WCED had so urgently called for.

[7] While the GEF aims at financing long term environmental projects, its replenishment cycle of four years doesn't allow for financial resources to be committed beyond that timeline.

PART I

A VISION FOR THE AMAZON BASIN

1. The Institutional Challenge and Risks

The need for joint action among the Amazonian countries has been identified as far back as thirty years ago starting with the signature of the Amazon Cooperation Treaty (ACT). The ACT is a legal instrument signed in 1978 by Brazil, Bolivia, Peru, Ecuador, Colombia, Venezuela, Guyana and Suriname with the aim of fostering an integrated and sustainable development of the Amazon Region, while achieving balanced distribution of benefits and improving the quality of life of the Basin's population[8].

Through an amendment to this Treaty in 1998, the member states agreed to set up the Amazon Cooperation Treaty Organization (ACTO) with its Permanent Secretariat in Brasilia as a mechanism to institutionally improve and strengthen the process of cooperation among the signatory countries and to enforce the implementation of the Treaty. In 2003, the Permanent Secretariat became fully operational and developed the Strategic Plan 2004-2012, which was agreed by the Foreign Ministers of the ACTO Member States in September 2004.

The political institutional development of the Treaty can be characterized in three phases, the first one - from 1978 to 1989 - qualified as the "defensive-protectionist phase"[9], being mainly concerned by the country member's national sovereignty in the face of their common and shared Amazon patrimony. While the first phase witnessed a long period of inactivity, it still introduced the concept of common but differentiated responsibility in a context where the "increasing global concern for viable ways of sustainable development and the importance of the Amazon region to humanity cause ACTO to be a contemporary tool to induce global sustainability"[10]. While this inactivity was attributed to the aggregated effects of the countries different realities, institutional weaknesses and scarce social recognition[11], a main outstanding factor was the failure of ACT in recognizing the Amazon region as a priority to the sovereign states. The second phase of political strengthening[12] (1989-1994) - through the renewal of political will towards the Treaty - took place in times witnessing a simultaneous democratization of its members, with Latin American economic and political harmonization of processes such as CAN and MERCOSUR[13]. This phase opened up negotiations to international cooperation for developing bilateral and multilateral projects and saw the emergence of agreements geared towards the respect of Indigenous Amazon Rights[14]. The third phase of institutional development[15] (1994 -2002) - moved by the observation of increasing complexity for Amazon cooperation and increased visibility in the international arena - witnessed the creation of the Permanent Secretariat and its transition towards the Amazon Cooperation Treaty Organization (ACTO).

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[8] Article I of the ACT identifies the primary goal as the implementation of "joint action for the promotion of harmonious development of the countries respective Amazonian territories in a way that produces equitable and mutually beneficial results and achieves the preservation of the environment, and the conservation and rational use of the natural resources of these territories".

[9] « La OTCA, algunas claves de su evolución historica », A. Aranibar Quiroga, ACTO, 2003.

[10] ACTO Secretary General Rosalia Arteaga in: « ACTO Strategic Plan 2004-2012 ».

[11] Quiroga, 2003.

[12] Ibid.

[13] « Comunidad Andina » and « Mercado Comun del Sur".

[14] « Strategic Action Plan 2004-2012 », ACTO, October 2004.

[15] Quiroga, 2003.

After the Secretariat was fully operational a fourth phase –of higher visibility and emphasized action – emerged, that identified two major weaknesses hampering the implementation of integrated programs. One was the lack of proper reference definition of the Amazon, the second, the lack of available long term planning methodologies and tools.

In response to the first issue, ACTO requested the support of the European Commission to set-up an expert's commission with the task of defining the geographical boundaries of Amazonia. The group provided a scientific basis for delineating the region based on consensus among disciplines ranging from local scale species distribution to global climate scale roles (see Annex I) with two key elements: "the entire hydrological Amazon and the Tocantins river basin; and two areas located outside of it, i.e. the Guiana and Gurupi regions"[16]. While the report aims at maintaining flexibility in the definition and acknowledges that the use of the entire Basin brings in areas – like Andean and Cerrado – that are usually not considered of as Amazonian, it makes a point that they play essential roles in the functioning of the Amazon hydrological systems as they contain the headwaters (the source) of the Basin's rivers.

In response to the second challenge, the eight member countries requested GEF support in order to undertake a Transboundary Diagnostic Analysis - Strategic Action Program (TDA-SAP) project at the Basin level. The TDA-SAP is a UNEP developed resource assessment methodology based on technical and scientific identification of causal chain relations of critical hydro-environmental problems in river basins from their physical, socio-economic, legal and politico-institutional aspects.[17] Yet, while the TDA-SAP is a proven methodology undertaken throughout many applications[18], none so far has had to deal with a level of complexity similar to the one presented by the Amazon Basin, where the simple number of countries involved is exponentially increasing the risks faced by the project.

From a technical point of view, the very geographic extension of the Basin is an obvious risk to the effective and efficient participation of stakeholders; while the low environmental consciousness by the stakeholders is a second challenge to their active involvement. Initially, it was the very length of the frontier coupled with low population density that led Brazil, for example, towards the securitisation of environmental matters. In 1991, conflicts broke out, when Brazilian garimpeiros were captured by the Venezuelan National Guard in an area not clearly defined; and the situation was aggravated by the Brazilian military flying through the same region[19].

From a governance perspective the potential incompatibility of national interests with respect to the regional integration process of the Amazon Basin management probably represents the highest level of risk currently faced by the project, as illustrated by the still unresolved territorial issues mounting back to the mid-19th century war between Chile, Peru and Bolivia, despite numerous bilateral and multilateral attempts[20]. Even though the project has been endorsed at a high political level - thus showing the countries' disposition for regional

[16] « A proposal for defining the geographical boundaries of Amazonia", European Commission-Joint Research Centre/ACTO (EC/JR), 2005.
[17] "Course Design and Development (DACUM) GEF TDA/SAP", L. Mee, Division of Ocean Affairs and the Law of Sea, Office of Legal Affairs, UNEP, 2002.
[18] « International Waters Program Study 2004 », GEF Monitoring and Evaluation Office, 2004.
[19] "Environmental change, social conflicts and security in the Brazilian Amazon: exploring links", Alexander Lopez, University of Oslo, 2000.
[20] « Dialogos de Paz :una propuesta de los pescadores Artesanales de Chile », CONAPACH, 2007.

cooperation and coordination efforts - at the level of national politics, Amazonian issues are still treated as a sensitive topic, often related to national security[21]. For example in Brazil, the military regime established a clear relationship between the Amazon economic and geopolitical approaches by linking the notion of security to economic growth imperatives[22] through human occupation and territorial control[23]. This problem might be even more significantly affected by eventual governmental changes in one or more Amazonian countries as often a political change at government level leads to changes of technical leadership and discontinuities in an ongoing project or process[24]. The project might also be faced with commonly found cultural resistance against integration. The recent threat from Venezuela to leave various multilateral organizations like the World Bank and the IMF is one issue in itself, but would become a fundamental barrier to the project implementation should Venezuela withdraw its membership from the Organization of the American States, who is currently the intermediary project executing agency.

At the institutional level, the project is facing unclarity and uneven legal competences. In some countries like Surinam and Guyana the legal competence of the respective water agencies are not properly defined and generate inter-country contradictions, conflicts, and overall basin-wide lack of efficiency. Furthermore, water resource management at national level is in most countries sub-divided into different sectors and/or institutions that are often competing for funding with conflicting political interests. Jointly, these institutional challenges might lead to what has been defined by as "bureaucratic capture"[25], which is topped by the fact that such projects always risk under-funding, especially insufficient national financial commitment and human resources; which is –as will be seen later – one of the major risks faced by GEFAM is inadequate financing.

In order to understand and mitigate those risks, the project will use a formal scenario planning methodology that will provide a framework for strategy development and decision-making.

2. The Geo-environmental Context and Anthropogenic Intervention

The Amazon River Basin covers almost one-half of the South American continent, extending over more than 6.2 million km², from the eastern part of the Andes mountains in the west to the Atlantic Ocean in the east[26]. There is no current consensus on the actual size of the Amazon River Basin. Numbers range from 6,869,344 to 7,500,000 Km2[27]. Brazil's and Peru's portions of the Basin correspond to 67.76% and 10.21%, respectively, followed by Colombia (6.42%) and Bolivia (5.36%). Nearly 100% of Guyana and Suriname are located within the Basin, which represents 36.23% of Bolivia's territory, 59.12% of Brazil's, 41.91% of Colombia's, 45.08% of Ecuador's, 59.3% of Peru's, and 20.2% of Venezuela's territory.[28]

[21] GEF IWPI, 2007.
[22] Lopez, 2000.
[23] This Brazilian "developmentalism" phase or "colonization of the Amazon" took place between 1964 and 1985 through the so called "operation Amazonia" in 64 and three following development plans.
[24] Mee, July 2002.
[25] "Participatory Approaches to Environmental Policy", EVE, Policy Research Brief no10,Bruna De Marchi & Jerome Ravetz, 2001.
[26] GEF IWPI, 2007
[27] "Populaçaões da Pan-Amazonia", Luis E. Aragòn, NAEA, 2005.
[28] Ibid.

The eastern portion of the north Brazilian plateau forms the coastline through which the Amazon discharges to the South West Atlantic Ocean Large Marine Ecosystem (LME) [29].

The Amazon Basin is composed of a wide range of landscapes with specific climatic and topographic characteristics having elevations ranging from sea level to 6,500 meters[30]. The majority of the countries (Bolivia, Ecuador, Colombia and Peru) form the headwater zone of this vast drainage system. Beyond the geographic catchment area, the Amazon Basin is defined by a specific biogeography that extends beyond the hydrographic basin while superimposed upon both of these delineations of Amazonia, is the political geography of the eight Basin countries[31].

The flow regime of the Amazon River system is still relatively un-impacted by human activities, but is subject to important inter-annual and long-term variability in tropical precipitation, which produces large variations of river water levels. The whole Amazon River system discharges an average of 6,300 km3/per year[32] (approximately 210,000 m³ per second) into the Atlantic Ocean. This volume of water is equal to more than 15% of annual global river runoff, exceeding the combined discharge of the world's nine next largest rivers[33].

The Amazon River with a length of approximately 7,100 km[34] - from its source (a small Peruvian river, the Apurimac, located about 5,700 m above sea level) to the Atlantic Coast of Brazil—is the world's longest, widest, and deepest river with sixty-five percent of the Basin's total flow coming from only two sub-basins, the Solimões and Madeira[35]. A further approximately 15% of the flow is provided by the Rio Negro sub-basin, a black water system, which joins the white water system[36] of the Rio Solimões at the famous *"Meeting of the Waters"* [37] (encontro das águas) near Manaus, Brazil (see Map Annex II), where the two rivers don't immediately mix and flow side by side.

Precipitation levels range from 200mm per year in the Andes to more than 6,000mm per year, representing a total volume of over 15 trillion m³ per year[38] in some parts of the foothills and plains of the Basin. This enormous volume of precipitation in this hot and humid tropical climate generates a movement of huge volumes of warm superficial water circulating throughout an extensive drainage network covered by dense vegetation, and recharges a widespread and complex groundwater and aquifer system, Aquifer Amazonas[39]. While there is little scientific knowledge of its full extent, geological data suggest that the Aquifer Amazonas could be the largest transboundary groundwater system in South America, covering an area of 3.950.000 km² [40] in Brazil, Bolivia, Colombia, Ecuador, Peru and Venezuela through the Solimões, Içá and Alderdo Chão formations.

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[29] IUCN defines LMEs as relatively large (orders of 200,000km2) regions of Ocean space encompassing coastal areas from river basins and estuaries to the seaward boundaries of continental shelves and the outer margins of the major current systems.
[30] IWPI, GEF, June 2007
[31] Ibid.
[32] "Changes in the hydroclimatology of the Amazon Basin and derived risks for humans and vulnerable ecosystems", J.A Marengo, CPTEC/INPE, CPR/OEA-18/2006.
[33] IWPI, GEF, June 2007.
[34] "Biodiversity and Water Ecosystems in the Amazon Basin", Y. Guzman, CPR/OEA no 103642, February 2007.
[35] Marengo, 2006.
[36] White water rivers are muddy with a yellow to brown clay discharge. Black water rivers are clear with very low sediment charges, the blackish colour coming from the humic acids.
[37] IWPI, GEF, June 2007.
[38] Ibid.
[39] Ibid.
[40] "Water Monitoring for Sound Policy Development", Paulo Varella, Agencia Nacional de Aguas (ANA), Bratil, 2007.

Finally, the Amazon Basin accounts for more than 56% of all broad leaf forest in the world, with more than 30,000 plant species, nearly 2,000 fish species, 60 reptile species, 35 mammal families, and approximately 1,800 bird species currently being recorded[41]. Additionally, the Basin contains the world's largest known reserves of bauxite[42] (nearly 15% of the world total), and significant reserves of oil and other minerals that form the basis of a large-scale extractive industry.

The combination of these factors makes the Amazon Basin one of the most important and sensitive contributor to the global hydrological cycle, consequently playing a major role in the global climate[43]. Simultaneously anthropogenic pressures on the Basin are changing the state of the forest cover and soil, which in turn impacts carbon fluxes[44] and further increases the area's vulnerability to climate cycles.

The main anthropogenic impact in the Basin is deforestation which can be attributed to every single human activity in the region, from cattle raising, agricultural activities and subsistence economy; mining, logging and related dam and road building, to migratory processes and urban development often spun by absent or inadequate public policies. Cattle raising and the advancement of the agricultural frontier[45] are the main sources of the problem and often are a result of land speculation, tax incentives and negative interests loan. In Brazil for example clearing establishes property claims[46] which raises the resale value of land; fiscal incentives allow businesses to avoid paying taxes on Amazonian investments; and lower than inflation interests rates are applied for the financing of government approved ranching projects[47].

A famous example of deforestation for dam and road building in Bacarena, Para, is the construction of the Tucuri dam to provide subsidised energy to the multinational aluminium company Albras[48]. The project encroached on three indigenous people reserves and affected at least six tribal groups totalling 800 people. The dam created an artificial lake (2,500km2 of flooded land in three municipalities) causing 4000 families to loose their land, drowning tens of thousands of Brazil nut trees and leading to the collapse of the Mapara fishery on the lower Tocantins[49]. Deforestation in turn leads to land degradation and soil loss which are aggravated by the fact that Amazon soils, while fertile are thin and have very limited capacity of storing nutrients[50]. The main cause of habitat and biodiversity loss is also the result of deforestation as well as climate change[51]. Additionally, significant water contamination is due to productive activities –both legal and illegal – in all major urban centres, as they discharge wastewater directly into water bodies without adequate treatment[52]. While some activities are manageable due to their location and big scale, the dispersed and small scale nature of others are very difficult to control[53].

[41] "Amazon Basin", Water Project Series no 8, OAS, Office for Sustainable development and the environment, Oct.2005.
[42] IWPI, GEF, June 2007.
[43] Marengo, 2006.
[44] In Brazil, the Stern Review identifies Amazon deforestation as the largest source of CO2 emissions.
[45] « The colonization of the Amazon », Maria Luiza Ozorio de Almeida, ILAS Translation from Latin American Series, 1992.
[46] In Roraima settlers who spend five years on scatted land can claim ownership.
[47] Lopez, 2000.
[48] « Aluminium produkzion und Zivilgesellschaft in Brasilien », Schäfer & Studte, Kassel Universität & TU Berlin, Oct 2005
[49] Lopez, 2000.
[50] "The Amazon Region: Boundaries, Morphology and Environmental Challenges", GEFAM – Annex G, FP, 2007.
[51] Rainforests are delicately balanced ecosystems which can be substantially affected by small changes in water temperatures or precipitation levels.
[52] Like oil extraction in the sub-basins of Pastaza, Tigre, Coorientes and Napo [Peru/Equador] and the Urucu basin [Brazil].
[53] Like gold mining in Madre de Dios (Peru), fisheries with toxic or explosive substances and cocain production.

Another indirect but major environmental degradation resulting from human activity is the sedimentation of water bodies and courses due to the erosion caused by deforestation[54]. Coupled with aquatic resource depletion and unsustainable use of aquifers, these local, regional and global activities are cumulatively leading to extreme meteorological events, temperature rise and glaciers melting that are conducive to abrupt and irreversible replacement of forests by savannahs.

In order to scientifically evaluate human activity impact on the Basin ecosystem it is necessary to understand the natural resource base through a holistic methodology like the TDA.

3. The Socio-Economic Context and Conflicts

The population of the Amazon Basin is estimated at approximately 27 million inhabitants[55], mostly concentrated in relatively few urban areas [56] and mainly living in the Brazilian portion of the Basin. These centres are located along the main river and its tributaries, while in the upper Andean part of the Basin a high percentage of the total population consists of indigenous communities[57], which are considered to be historically disadvantaged groups who should benefit from the protection and environmentally sound management of the Amazon River system. While 71.94% of the Basin's population is Brazilians, and 13.84% is Peruvians, the Amazonian population represents nearly 100% of Guyana and Suriname's population, 14.6% of Peru's, 11.85% of Brazil's and 9.73% of Bolivia's[58], showing the low population density of the Amazon Basin region relative to that of non-Amazonian parts. However, the region's population growth rates are picturing another reality, raising awareness of increasing pressures over the basin's natural resources[59].

Table I

Country	Annual National Population Increase (%)	Annual Amazonian Population Increase (%)	Country Population Density (hab/km2)	Amazonian Population Density (hab/km2)	Total Amazonian Population[60]
Bolivia	2.74	3.06	8.00	2.00	805101
Brasil	1.93	2.94	19.90	4.00	20129685
Colombia	1.61	2.50	38.50	2.40	1130295
Ecuador	2.10	3.20	47.30	4.70	548419
Guyana	0.23	0.23	3.40	3.40	742041
Peru	2.00	3.70	21.40	5.10	3872120
Surinam	1.50	1.50	2.90	2.90	481146
Venezuela	2.20	2.10	27.20	0.60	113722
Total	-	-	21.10	3.80	27979742

Source: Aragon

[54] Andean slopes transports an average of 600 to 800 million tons annually principally coming from the Solimões (62%) and Madeira (35%).
[55] Aragon, 2005.
[56] Belém, Manaus, Río Branco, Porto Velho, Boa Vista, Iquitos, Leticia and Macapá, among others.
[57] Forest People Program identifies the indigenous Amazonian nations as belonging mainly to the following ethno-linguistic groups: Quichua, Inga, Secoya, Huitoto, Andoque, Ynomami Waimiri, Atroari, Matis, Mayorum, and Ticuna.
[58] Aragon, 2005.
[59] Straight forward comparable (absolute) numbers to calculate population growth are not available. This table is taken from a collective attempt –led by Luiz. E Aragon – at estimating Amazonian population growth over the past decades and has become the current reference. More information on analysis methods and sources in the various countries is available in "Populaçaoes da Pan-Amazonia".
[60] As of 2000.

During the last two decades, the population of the Amazon Basin has "exploded," in large part spurred by the high levels of immigration into the Basin and the extensive transboundary migrations. Historically, the settlement patterns got intensified in the early and mid 1970's, when strategic governmental plans first attempted to promote economic development in the region through constructions of extensive roads and fiscal incentives for new settlers, triggering massive migration of landless people into the region[61].

There are mainly two migration movements happening in the Amazon Basin[62], one coming from the outside into the Amazon region, and the other being an urbanization process within the region - primarily composed of women and young people in search of better living conditions in the cities. These immigration pressures have created an exponential urban population growth that highlights the importance of urban centres - some of them with more than 2 million inhabitants- as attraction spots for people from complex backgrounds and different ethnicities, thus creating a particular cultural identity. This largely urban but very specific melting pot is leading the region's political and economic reality, as this is where the powers are located (including academics, scientific institutions and opinion shapers).

The Amazon Basin in its strict sense of a watershed does not correspond to any cultural or social unity[63]; each country has its particular and specific legal and political system, culture, and socio-economic form of organization. Within these countries, a variety of stakeholder interactions are happening from many different social and economic origins, holding different interests and point of views (mental maps) on the region. These interests are often contradictory and have generated social conflicts - declared or not - whose apparent beneficiaries have mainly been the powerful elite of the region, owner of the land and financial resources[64]. On the other hand, local communities and the environment suffer the drawbacks of these conflicts of interests.

As described by de Almeida the list of antagonisms in the Amazon is endless and include conflicts: "such as those between small and large farmers, or farmers in general and extractivists, whether rubber tappers (seringueiros), small prospectors (garimpeiros), or large mining companies. All these additionally conflict with government projects such as hydroelectric dams. Producers in general (public and private) are harmed by speculators; and developmentalists are opposed by conservationists"[65] Additional actors such as fazendereiros, Indians, cablocos, posseiros, sem terra define a universe of many different and conflicting interests.

Two examples have been well documented by Lopez, in the Brazilian states of Roraima and Para. In Roraima most conflicts are related to gold mining on the Yanomani lands[66], gold and cassiterite mining in Waimiri-Atroari[67] area and gold mining and ranching in the

[61] Marengo, 2006.
[62] "Understanding the Amazon society: Needs and Goals", OEA/GEF, CPR no 120175, June 2007.
[63] EC-JRC/ACTO, 2005.
[64] OEA|GEF 120175, 2007.
[65] « The colonization of the Amazon », Anna-Luiza Ozorio de Almeida, ILAS Translation form Latin American Series, 1992.
[66] The Yanomani are primitive hunters and gatherers occupying the border area between Brazil and Venezuela where the discovery of gold deposits spurred an invasion of about 40,000 garimpeiros in 1987 –there were 7000 Yanomani recorded in 1991- leading to murders partially recorded by the Conselho Indigena de Roraima – CIR.
[67] Waimiri-Atroari live in the Basin of Alalau river and were invaded in the 70s by the Parapanema mining company. In 1986 social stress was increased by the building of an associated private hydoelectric plant and a private road, leading to Indian occupation of the road for more than a month. While this ended with a minor return payments, social costs of relocation have been very high.

Raposa/Serra do Sol[68]. On top of inappropriate institutional and legal frameworks to regulate productive activity, these conflicts emerge from one part of the population –Indians, cablocos, ribeirinhos-holding one set of values, beliefs and norms with regard to resource use, and a second one –garimpeiros, fazendieros and posseiros – holding completely different ones. Similarily Lopez has documented social stress in Para related to land conflicts with grileiros violently invading land for the sole purpose of reselling it later[69]; mineral conflicts with a two-dimension phenomenon –garimpagen and the formal sector – leading to disputes over ownership of mineral sites, and like in the case of Roraima, conflict over Indian land related to norms and values about resource use[70], mainly gold and timber[71].

If compared to non-Amazonian regions of the eight Basin countries, the Amazon parts are marginalized in socio-economic terms. Livelihood is in great part based on primary activity, such as natural resources exploitation through agriculture, and cattle raising aimed at self-subsistence, while industrial production is concentrated in relatively big urban centres, such as Manaus and Belém (Brasil), and in the north-western Amazon cities of Colombia[72]. Commerce and public administration are the two main income-generating services in the cities.

The small financial added-value of these economic activities is reflected on the Basin's low family income, which associated to the low level of education, access to health and sanitary services pictures greater poverty than that found in the non-Amazonian regions of the countries and explaining its high child mortality levels and diseases incidence. This situation also directs the migration flows in the region.

The Amazon Basin is experiencing exponential population and economic growth at a time when the social, political and educational structures in place are extremely weak. Because these structures are unable to keep pace with that growth, they do not provide this fragile, new, Amazonian society with the means to defend itself. In order for the adequate institutional structures to emerge and strengthen, while taking into account the social complexity of the region it is necessary to foster a common identity through a shared vision.

[68] Indian population of the region include Macuxis, Ingarikos and Wapixanas. The most important form of violence leading to conflict, has been the invasion of Indian land by posseiros, and the burning of their malocas by posseiros and ranchers. Between January and October 1997, the CIR registered about twenty different conflicts.
[69] 1500 death recorded between 64 and 86.
[70] The cases of Serra Pelada and Projecto Grande Carajas became so notorious it has led to the militarisation of the mining issue and the Kayapo reserve in terms of mining and the Xicrin Catete in relation to logging are two examples of conflicts over the rights to exploit gold and timber (Lopez).
[71] Lopez, 2000.
[72] IWPI, GEF, June 2007.

PART II

PLANNING UNDER UNCERTAINTY

1. The Need and Difficulty of Collective Action

As Part I has showed, by affecting the regional tropical circulation system, anthropogenic interventions constitute an important potential contribution to modifying and influencing global climate change. The impacts of these changes also affect the Basin. Risks are due not only to projected climate change at the global level, but also to complex interactions with already existing threats, such as land clearance, forest fragmentation and fire[73]. Over the next several decades there are significant possibilities for large-scale loss of biomass with a concomitant loss of biodiversity and livelihoods for people in the Basin.

Current research confirms that human activities trigger changes in precipitation, evaporation and discharge patterns all over the Basin, significantly impacting regional economic development and development opportunities[74]. This, in turn increases the vulnerability of its population to extreme hydrological and climatic events. Severe droughts like the "El Niño" event of 1997 have dried up entire lagoons, triggered large-scale forest fires, resulted in fish kills, crop failures and extinction of protected species[75]. Isolated villages have disappeared, rivers have dried up and disease has been exacerbated, all contributing to severe economic losses.

The Amazon Basin is still covered by tropical rainforest. However - over the past thirty years - human activities on the landscape have led to a process of rapid biomass destruction (deforestation) converting over 600,000km2 of tropical rainforest into grazing and croplands[76]. Recent studies also suggest a new paradigm of Amazon deforestation[77] defined by larger clearing sizes and faster rates of forest conversion than previous pathways of forest loss for pasture and smallholder agriculture.

The region is subject to multiple, simultaneous and complex development interventions, starting with national governments intervening under their own sovereign interests. Powerful regional stakeholders, mostly linked to regional political structures are also rapidly changing the environment through activities related to land speculation, timber extraction, extensive farming and cattle-raising, while the Basin continues to support large-scale extraction of timber and agro-industrial production of soybeans[78], all increasing pressure on the tropical ecosystems. Few of these activities support secondary industries within the Basin, contributing to a significant gap in its economic development potential, and suggesting that development pressures will continue to increase substantially in the foreseeable future.

Additionally, this large ecosystem is characterized by a great biodiversity reservoir of plants and animals of global importance, the biotechnological possibilities of which - and the

[73] Marengo, 2006.
[74] « Hydroclimatologcal forecasting system for the Amazon Basin », Tucci & Allasia, OTCA, Nov. 2006.
[75] GEFAM – Annex G, FP, 2007.
[76] "Amazon Basin Digital Map and GIS", Marcos Freitas, ACTO, Feb.2007.
[77] "Cropland expansion changes deforestation dynamics in the Southern Brazilian Amazon", D. Morton & al., PNAS, 2006.
[78] In the 1990s, the Amazon occupation model changed with the implementation of large-scale soybean production and the related construction of multi-modal transportation corridors - integrating hydro, rail and roadways -, thus becoming an important factor of deforestation.

consequent economic potentials - are still underestimated and poorly understood[79]. Finally, the Basin is witnessing two conflicting types of international interventions; the environmental conservation movement on one hand, basically trying to preserve the forest; and powerful multi national companies' activity on the other, mostly related to oil, mineral exploitation, and large-scale agro-industry.

Development efforts in recent decades have led to significant changes in the Amazonian environment. The proliferation of roads and highways, the increasing demands of international markets for agricultural and forest products, new waves of immigration and settlement, and oil and gas exploration has contributed to the rapid growth of cities and towns in the region's interior. Not only were these initiatives unable to enhance the quality of life of the Amazonian population – mainly because profits have not been reinvested within the Basin - but they also contributed to the current problems of deforestation, erosion, sedimentation, and water pollution, with concomitant impacts on human health and welfare, that are only expected to increase. The resulting alteration of water, energy, carbon, and nutrient cycles from changes in, inter alia, plant cover can lead to and exacerbate local, regional, and global climatic and environmental consequences[80]. As has been mentioned previously global warming may have drastic impact on Amazonia, which may be subject to higher temperature increase than global average, with simultaneous significant reduction in rainfall turning the tropical forest into cerrado savannahs[81].

This level of complexity, coupled with a speedy rate of change in an environment facing a high degree of uncertainty has triggered the need to look for a formal process that could work as a risk mitigation system while simultaneously creating a strong foundation on which to base the SAP. Developing a solid, shared, committed to Vision of the Basin will help the regional governments, the private sector and the society in general, in reaching consensus; which in turn will facilitate national and regional strategy formulation and policy planning, while improving development management, i.e. support ACTO in reaching consensus and achieve its mission of integration through harmonious development of the Basin, equitable distribution of benefits, and maintaining the balance between economic growth and environmental conservation.

In the case of GEFAM, the Mission has been given by the GEF and defined as the Integrated and Sustainable Management of Transboundary Water Resources with a specific objective of developing a SAP through the engagement of local communities. The Mission is a statement defining the main purpose for which [GEFAM] exists[82]; while a Vision is a projected image the project will need to have of this goal – a story. It is an answer to the question "where do want to be fifty years from now?" and it is a crucial step in allowing people or constituencies with multiple and conflicting interests, to start working together.

Regularly, attempts at building visions fail. Reasons vary but most commonly they tend to be either a person or a one-group's vision imposed on others[83], thus killing its power for a common sharing: the desire to be connected in a common undertaking[84]. Another frequent problem is the "expertise" risk. Because it is very easy to always find 'someone who knows

[79] IWPI, GEF, June 2007.
[80] Ibid.
[81] Freitas, 2007.
[82] "Total Quality Management", ISO 9001.
[83] This typically happens within corporations and the late Swissair disaster is a perfect example of inadequate short term strategies serving a one-person/group's ill-developed Vision.
[84] "The fifth discipline: The art and practice of the learning organization", P. Senge, Doubleday/Currency, 1990.

best' the responsibility of building the vision often gets transferred to an outside "elitist" group as was the case with another UNEP/GEF project in the Bermejo Basin (which also prompted the search for an adequate process to be applied in the Amazon), thus hampering its other purpose of creating a common identity. Vision development is a resource consuming process that needs to be properly financed. The example of the 1997 scenario exercise aiming at developing a Vision for Columbia[85] failed because the financing was only planned for the "story-development stage" and thus the Vision-creating phase never got picked up by a political process. Finally many attempts at vision building simply remain either idealistic statements or just a vague platitude. This often happen in complex situations when a formal process is not applied to minimize these risks, thus stripping the vision (the story) from the force it must carry to achieve its main purpose, namely to be a realistic, shared, committed to framework against which to develop adequate strategies.

This complex situation requires consideration of the interconnectivity of larger contexts and many diverse stakeholders in the preparation of the SAP that can not be isolated from the health and viability of the region's underlying life support systems. It will require the use of a long term strategic planning method to develop a framework that allows for thinking and acting in terms of multiple geographies of connection and in terms of multiple timeframes, to ensure that short-term interests do not foreclose longer term options[86].

The heavy symbolism carried by the Amazon Basin calls for a method that is appealing and efficient at local, national, regional and global levels. GEFAM will use story telling (and creation) to help build a strong and engaged Amazonian community ready to move forward together, while fully aware of the challenges ahead.

2. Scenarios Planning

Since its inception as a strategic military tool and early use by the Club of Rome, the scenario tool has evolved considerably. From an initial corporate use in the 1960s, the method gradually filtered outside the business world and over time, its applications have widened and continue to do so as it is being experimented by different groups in different places. By nature scenario planning is an ongoing learning process, which allows not only to prepare for the future but is also a powerful tool for shaping the future.

Scenarios are alternative, plausible stories of how the wider environment may develop in the future. They are not predictions of what will happen, but credible, robust, relevant and challenging possible stories that enable to explore hypotheses (what if?)[87]. The purpose of scenarios is not to pinpoint future events, but to highlight large-scale forces that push the future in different directions.

A set of scenarios provides a learning environment (a framework), in which policy and decision makers can explore theses forces, better understand the dynamics shaping the future and thus, assess strategic options and prepare to take strategic decisions[88]. They provide (create) a common language and basis for communicating complex and sometimes

[85] "Destino Columbia" was entirely financed by Columbian businesses.
[86] « Business in the World of Water », WBCSD Water Scenarios, 2006.
[87] « Corporate Strategy Board Research », Shell International Limited, CODA, 1996.
[88] « Scenarios: the art of strategic conversation », Kees van der Heijden, John Wiley & Sons, 1996.

paradoxical options and conditions and they have the power to break old stereotypes because their creators can assume ownership.

The scenario development stage is a necessary one for reaching the Vision because in situations of true ambiguity, they allow to identify the driving forces of the future which are both critical and uncertain, enabling actors and stakeholders to look at alternative developments and respond to theses uncertainties[89]. The early scenario planning success at Shell (during the first decade of use) played a major role in propelling the company to industry leadership. In the early 70s, two scenarios were developed that addressed, among other issues, the price of crude oil. One of the scenarios explored a world of strong OPEC market power in which all prices raised sharply- a marked contrast to conventional wisdom at the time. "Prices had held steady for almost two decades, and nearly everyone in the business felt that they would continue to hold steady forever"[90]. By exploring the future business environment, Shell was prepared to the 1973 oil crisis as these scenarios brought forward some important perceptions of the world.

Scenarios are an alternative tool to forecasting in situations when uncertainties are overwhelming; whereas forecasting is only useful when one can rely on the observation of the past. This happens when the environment is changing slowly and linearly, which the previous section has showed not to be the case in the Amazon Basin, which is experiencing a constantly changing environment. The methodology aims at the perceptions[91] of actors, decision-makers and stakeholders by transforming information into fresh perceptions, thus changing mental maps[92]. They will brighten the perception of the various Amazon Basin systems by making an imaginative leap into the future and help finding common ground.

The most famous example of this is the scenario process that led up to South Africa's first all race election heralding the end of forty years of Apartheid. The Mont Fleur project took place during the period between February 1990, when Nelson Mandela was released from prison - the African National Congress (ANC), the Pan African Congress (PAC), the South African Communist Party (SACP) and other organizations were legalized- and April 1994, when the first all race elections were held. Mont Fleur was a forum that, uniquely, used the scenario methodology. The purpose of the project was to stimulate debate on how to shape the next 10 years. Mont Fleur brought together a diverse group of 22 prominent South Africans (politicians, activists, academics and business men) from across the ideological spectrum, to develop and disseminate a set of stories about what might happen in their country over 1992-2002.[93] Four stories were developed producing substantive messages. A fourteen pages report was distributed as an insert in a national newspaper and a 30 minutes video was produced. The team then presented and discussed the scenarios with more than fifty groups, including political parties, companies, academics, trade unions and civic organizations.

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[89] « Strategy under Uncertainty », H. Courtney & al., Harvard Business Review, Nov-Dec 1997.
[90] Kees van der Heijden, 1996.
[91] « Scenarios : Unchartered Waters Ahead », Harvard Business Review, no 5, 1985.
[92] Another Shell example illustrating perceptions was during the 80s, when oil companies were to start drilling in the North Sea. Very rough conditions and extreme depth were to be experimented. Shell's group planning came up with a scenario suggesting the 1986 oil price crash, when every single forecast had prices shooting up. The story had the oil price drop to $16 a barrel because of the nature of OPEC itself. This situation was not one of a "natural" demand and supply, but one determined by OPEC's cohesion. Economic disparities among these countries allowed for one scenario to develop the possibilities of some countries to break the rules for need of "cash". Shell's management had the engineers redesign their platforms as to break even at $25 (instead of the $58 predicted by the International Energy Workshop) and in the next 10 years, Shell was the only oil company in the world to prosper in the North Sea.
[93] Adam Kahane, "The Mont Fleur scenarios", GBN, Deeper news, vol. 7, nb. 1.

The power of story telling is essential in creating and communicating a Vision, because it is an information mechanism that appeals to everyone. While the process (see process table in Annex III) is based on solid scientific and technical knowledge, it is a story about the common future of the Amazon Basin that needs to be communicated, not reports or statistics.

The characteristics that make scenario planning powerful are[94]:

- The process is *inclusive and holistic*; stories encompass all aspects of the world as desired by the exercise taking place - social, political, economic, cultural, ecological etc. –at local, national and global levels. This will be defined by the interviews and in-depth study of the Amazon society. The input of the study will feed into the first scenario development workshop, which will identify and analyze the driving forces that will shape the future of the Amazon Basin.
- *Logic*. The process is logical as to "can you convince your fellow team member that the story you are putting forward is plausible". This will happen during the two next scenario development workshops, which will contemplate a set of story lines; structure them; identify the relevant interconnections and define the story logics –including discontinuities. The relevant plots and stories, as well as their dynamics, will then be developed and in some cases quantified.
- *Openness and informality* allows participants to discuss everything, even taboo subjects[95]. Instead of focusing on the past and present, where people easily blame each other, the process shifts the discussion towards the future, towards the possible.
- *The process elicits choices*. The future is not predetermined; the choices we make influence what happens. After the scenario communication strategy has been properly implemented, the messages disseminated, and debate has occurred, each workshop participants will have the responsibility to bring back the scenario stories to their respective constituencies and analyze what implications each future possible scenario will have for them and how their current strategies, policies, pipelines, investments and actions will affect or be affected by these alternative futures.
- *The process is constructive.* The analysis of theses implications will be brought back by the participants to the fourth workshop, which will be dedicated to build a shared Basin Vision on the closest possible denominator basis. The Vision will be the cornerstone for the development of adequate associated strategies for the SAP.

In order to achieve this, the scenario process will clarify the environment by launching a comprehensive study of the Amazon society, through an extensive stakeholder identification, interviews and analysis aiming at applying latest scientific knowledge, data and projections to evaluate the current trends in the Amazon Basin in terms of social, environmental, economic and politico-institutional aspects. The purpose will be to understand and document the needs, interests and aspirations of Amazonian society. This in-depth analysis is a crucial building block in developing the scenarios and is, in the specific context of the Amazon Basin even more-so important, as such a study has never been undertaken before. The project will specifically target the participation of the private sector and the civil society in the

[94] OEA/GEF CPR no 1201175, 2007.

[95] During the first half of 1997 a group of Colombian businessmen invited 43 people drawn form among (using their own categories) academics, self defense forces, peasants, the right and left, businessmen, managers, guerrillas, the church, NGOs, intellectuals, researchers, youth, the media, the military, blacks, politicians, political analysts, popular movement and trade unions. Four of the illegal guerrillas participated in the workshop by speakerphone from a maximum security prison and from exile.

development of the scenario stories. Indeed, it is crucial that private sector interests and governance issues - at local, national, regional and global levels – are explored and integrated simultaneously to the SAP formulation process. Equally important is a similar investigation of civil society views and mental maps, especially at the community levels, which tend to have been historically excluded - or not sufficiently and efficiently included- from such processes in the past[96]. The careful and targeted selection of the workshop participants will be a key factor in reaching the successful formulation of a shared Basin Vision and include at a minimum on governmental representative of each country (preferably from the financial planning sector), one private sector representative and one civil society representative.

The scenario methodology is particularly fit for multi-country/multi-stakeholder level applications such as GEFAM, because it works like a democratic tool and provides a strong bottom-up process, in a context where eight very different nations, indigenous tribes, urban centers, vast resources harnessed by private sector and global interests -simultaneously witnessing a steady impoverishment of local communities- leave much space for uncertainty.

3. Public Private Partnerships

Specifically, water management is mostly impacted by unsustainable water withdrawals for irrigation in agriculture; water requirements for energy (including cooling water), water use for production processes and finished product, and water being used as a medium for waste disposal[97]. It is clear that a major threat to the sustainability of the Amazon Basin is related to industrial activity and more generally –as has been indicated previously - the problems ensuing from private sector activities in the region encompass massive deforestation as well as a variety of transboundary stresses - ranging from over-fishing, water pollution and contamination at different scales, oil and gas exploitation, to gold and other mining extraction.

All these aspects are putting Water high on the business agenda[98] because all businesses depend on water. The continuity and future success of any business are impacted by the availability, cost, and quality of water at many points along the 'value chain', including 'upstream' (in the production and supply of raw materials), 'midstream' (in what businesses make from raw materials or other pre-processed inputs), and 'downstream' (consumers need water, and everyone needs water to be treated and recycled). Like people and governments, businesses tend to ignore water until it becomes scarce, polluted, too expensive, or mismanaged[99]. But today – as a result of changes in both human and natural systems that affect water availability, access, affordability, and quality – the water management challenges facing societies is becoming more complex, with the prospect of water shortages, scarcities, and increased stresses.

While businesses have started to recognize the full value of sustainable use of water –mainly because population growth and economic development have accelerated demand for everything – most companies still lack an understanding of the risks and opportunities

[96] Rosia Montana mining project in Romania is particularly telling example of how the local Motzi community was excluded from stakeholder analysis in the so-called environmental assessment.
[97] "Water: Fact and Trends", WBCSD, 2005.
[98] In 1997, the World Business Council for Sustainable Development (WBCSD) formed its first water working group and started to document successful business experience in water management, partnerships and provision of water services to the poor.
[99] "Business in the World of Water", WBCSD, 2007

associated with the changing landscape of water[100]. In particular, they need to understand how increased water use efficiency can be profitable, but also how benefits can be delivered[101] either through the business sector taking the lead; working with civil society or supporting good governance and development. A relevant example of the latter is the case of Aguas do Amazonas (a subsidiary of Suez) who has successfully teamed-up with French development NGO ESSOR and Brazilian NGO ADEIS to connect empoverished communities to the water grid. The project[102] aimed at making access to water services more affordable for low-income communities by introducing a comprehensive tariff structure together with social engineering methods and approaches that can be replicated[103].

For this to happen, the private sector will need to explore the political, social, economic and ecological context of water issues for them to determine their role in a collaborative water framework, which can only be achieved through the simultaneous pursuit of multiple development goals, viable financial returns and stronger institutions[104]; which is the approach GEFAM will take in an integrated manner. Indeed, sustainable water management in the Amazon Basin requires the development of innovative public-private partnerships (PPPs) i.e. collaboration between the private sector, civil society and governments, which in turn highlights the necessity of achieving sufficient political will and public support to overcome concerns[105] within the society over private sector involvement in the water sector[106].

Through the World Business Council for Sustainable Development's (WBCSD) Regional Network, the private sector's engagement in the Amazon Basin will mean mobilizing and building its capacity –mainly through awareness raising - in order to achieve the integrated management of the Basin's resources. It will need to draw up alternative sources of revenues for reversing environmental impacts, and design measures to promote a higher level of environmental responsibility, while developing and disseminating environmentally sustainable technologies. As a leading regional Business Council, the BCSD Brazil (CEBDES –Conselho Empresarialn Basileiro para o Desenvolvimento Sustenavel) has taken the lead in coordinating the private sector's efforts with the other Amazon countries[107] within the GEFAM framework. Over the years, CEBDES has reinforced its relations with the Federal Government; is part of the Sustainable Development Politic Commission; Agenda 21; the Institutional Group of Cleaner Production; the Brazilian Forum of Clean Development Mechanism; the Council for the Administration and Management of Genetic Patrimony; and the Biotechnology Forum among other institutions that operate on Ministerial level. Other BCSDs in the ACT member countries have also worked on these types of inter-linkages to

[100] In 2004, the WBCSD launched a water scenario process, as an ideal tool for looking into the future and build a platform for dialogue, understanding and collective action. Participating companies included: Air Products and Chemicals, Alcan, BHP, Borealis, Cargill, Caterpillar, CH2M Hill, Coca-Cola, ConocoPhillips, ERMG, GrupoNueva, Panama Canal Authority, P&G, Rabobank, Shell, Severn Trent, Sonae, Suez and Unilever.

[101] "Collaborative actions for sustainable water management: the role business can play as an active stakeholder", WBCSD, 2005.

[102] The "Water for All" project focused on four low-income areas with a population of 15,000. The monthly cost of water was US$8.50, around 11% of average household income. After the connection to the grid the monthly cost, for three times more water was reduced to US$3.50, or around 4% of average household income.

[103] "Collaborative actions", WBCSD, 2005.

[104] "Development-driven public-private partnerships in Water", World Economic Forum, 2004.

[105] Example of problems related to uncontrolled privatization of water can be found in Giorgio Nembrinin and Riccardo Conti in "Forum: war and water", ICRC, 2006.

[106] This fear has been clearly identified through other GEF international water projects and is particularly strong in Latin America where they have been expressed in the San Juan, Deltamerica or Bermejo UNEP/GEF projects.

[107] As of today, there are actively implemented regional BCSDs in six of the participating countries, with Guyana and Surinam missing. The project will target regional BCSD creation in those two countries.

promote sustainable business, which will be explored during the scenario development process.

This capacity-building and awareness raising measures will be geared towards conservation and sustainable use of river systems and water ecosystems resources; the development and use of water-saving technologies; and efficient use of energy and carbon sources impacting climate change. Increased corporate competitiveness will then improve living conditions by creating jobs and revenues for local communities. Spreading and fostering the internalization of concepts like ecoefficiency and cleaner production aiming at minimizing the environmental impacts of production activities in the Amazon Basin contribute to multiply these partnership initiatives.

The experience of CEBDES has showed that companies that joined capacity-building programs and implemented cleaner production measures gained environmental and economic benefits with very little or no investment at all. Between 1999 and 2002, CEBDES launched a series of pilot projects in five different Brazilian regions (nuclei)[108] with 200 hundred participating enterprises. The studies showed that within three years these companies could reduce their costs (in commodities, water and energy) by BRL18 million. For BRL1 invested, there was a BRL4 return[109]. GEFAM will encourage the establishment of ecoefficiency nuclei in all participating countries so as to spread the concept and replicate corporate good practice. These nuclei will in turn incorporate (create) an ecoefficiency network, including smaller companies that belong to the production chain of major companies that operate in the Basin.

The promotion of mutual understanding between the business community and the non-business stakeholders requires a multi-sector approach involving public and private institutions, user's communities, project financiers, regulators, international donors and private foundations. The scenario methodology will allow the private sector to put the Amazon Basin Water Resources context on their strategic agenda by providing a platform for coming to a more systemic and shared view of the bigger and deeper picture.

[108] Rio Grande do Sul, Mato Grosso, Minas Gerais, Bahia, and Santa Catharina.
[109] "Ecoeficienca", Gazeta Mercantil, 10 August, 2005.

PART III

THE PARADIGM SHIFT

1. The Sustainable Development Model

Twenty years ago, the publication of the World Commission on Environment and Development report "Our Common Future" made an urgent and unambiguous call for change; for a transition from industrial development to sustainable development by –among other things – proposing the development of long term environmental strategies; encouraging greater cooperation between countries; and defining shared perceptions of long term environmental issues[110]. While it strongly warned against the dangers of compartmentalized and unadapted institutional structures incapable of keeping pace with both the rate of change and the exponentially increasing complexity of the issues at hand, it pinpointed the need to return to multilateralism as the most urgent task ahead.

The report underlined the inextricable connectedness of the economy and the environment and encouraged an ecosystem approach to development interventions –with strong public participation - on top of calling upon the United Nation's General Assembly to transform the report into a UN Sustainable Development Program.

Two decades later such a program has not materialized; most of our governance structures still deal with problems as if they were separated from one another, multilateralism is entrenched in the many problems we know and the ability of our institutions at apprehending issues in a long term, comprehensive manner doesn't seem to have progressed much. At best institutions have "greened". The housekeeping work has been done and is still in the making –at various levels, depending on the baseline, because organizations have found that there is "economic benefit" to be achieved through innovative technologies and behaviours. But the fundamental paradigm shift has not yet happened.

Why has such a visionary, compelling and respected piece of work not been able in the past twenty years to engage our global governance system into the profound restructuring process it needed in order to cope with the many environmental challenges and the global consequences of unsustainable development?

Here we want to offer two potential explanatory threads. The first is that the commonly approved model of sustainable development that emerged after the publication of the WCED report still maintains structural compartmentalization by creating confusion about what sustainable development really is. The second is that this very same representation model of sustainable development is "conveniently" leaving out the financial sector, which in turn doesn't allow for proper "measurement" (monitoring and evaluation) of sustainable development levels.

After the WCED released its report, it became popular across all sectors to represent its core content in the form of a triangle that pictured the society, the economy and the environment at each angle -as shown below. Another common representation is the one of the Greek temple (the hat being sustainable development), with the three supporting pillars as the economy, the society and the environment. Yet nowhere in the report is such representation depicted.

[110] "Our Common Future", The World Commission on Environment and Development, Oxford University Press, 1997.

Current Sustainable Development Model

Society

Economy Environment

The point this section is trying to make is that there is no difference between sustainable development and the economy. Sustainable Development *is* the Economy, which in turn can be more or less sustainable. As the chairman of the Commission writes in the foreword of the report: "The environment is where we all live, and development is what we all do in attempting to improve our lot within that abode"[111].

The argument is that it is the above representation of sustainable development that has maintained the divide and hampered societies' response to the WCED report's urgent call for a massive pooling of resources from multilateral and bilateral cooperation sources. Since the publication of the WCED report, only one single source of multilateral funding has been set-up to respond to the challenge by designing environmentally integrated and long term development projects: the Global Environment Facility. Since 1991 the GEF has disbursed a dismal US$ 7.4 billion (in 2006, total funds spent on Official Development Assistance – ODA- was US$103.9 billion[112]). In his Nobel Prize winning presentation, the Chairman[113] of the Intergovernmental Panel on Climate Change reminds us that in 2005, US$250 billion were spent by developed countries on agricultural subsidies and in 2006[114], global military expenditures amounted to US$1.2 trillion[115]. [116]

The most striking example of the failure of this model to promote integration is the year 2002 back to back "super-meetings"[117] of the international community. The World Summit on Sustainable Development held in Johannesburg on the one hand and the United Nations Summit on Finance for Development, held in Monterrey on the other. Not only is it puzzling that the two meetings didn't merge out of simple organizational logic, but on top of it, despite the many and obvious deep links between the agendas "there has been almost no interactions between the two, showing a clear 'environment' versus 'development' chasm"[118]. Again, we believe that it is by leaving out the financial sector from the sustainable development model above, that financial institutions have continued to behave as a "self-managed" system.

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[111] Gro Harlem Brundtland, Oslo 1997.
[112] www.oecd.org, 2007
[113] "Climate Change and Development", presentation R.Pachauri, Chairman IPCC to the Swiss Agency for Cooperation and development, October 2007.
[114] « World Trade Report 2006 », WTO.
[115] "Human Development Report 2007", UNDP.
[116] Straight forward comparable (absolute) numbers to calculate population growth are not available. This table is taken from a collective attempt –led by Luiz. E Aragon – at estimating Amazonian population growth over the past decades and has become the current reference. More information on analysis methods and sources in the various countries is available in "Populaçaoes da Pan-Amazonia".
[117] « Financing Sustainable Development: Crises of Legitimacy", Adil Najam in: Progress in Development Studies 2,2 pp. 153-160, Arnold, 2002.
[118] Ibid

"Institutions involved in financing for development, including financing for sustainable development, tend to see themselves very much part of the financial system, rather than the development system […and as such…] they insist on measuring their efficacy and legitimacy in terms of their financial strength rather than their development impacts"[119].

It has become urgent to think about sustainable development in a way that explicitly includes the financial sector as the major pivotal tool for our economies to develop in a sustainable manner. In order to engage in this debate GEFAM's scenario exercise will specifically target the finance ministries of ACTO's member countries as Governmental representatives in the various workshops.

2. The Investment Gaps

To promote long-term sustainable resource management, financial policy planning is indispensable and needs to be coupled with access to funding from governments, private sector and international development institutions[120].

A consistent financial strategy to support the SAP in securing its autonomous financial sustainability, will explore the use of financial instruments like water pricing, ecosystems services prices and the adoption of Clean Development Mechanisms on the one hand. On the other hand, it is also necessary to investigate entrepreneurial and investment tools such as business development services, loans and equity, savings, capital & intellectual asset development (CIAD), so that rural producers themselves and indigenous communities in general, as private entrepreneurs, can become their own source of financing and make the necessary investments in productivity and sustainability. However, as revealed by most "lessons learned" of development interventions, funding from governments and international development institutions are insufficient to achieve these goals.

Despite some successes, micro-finance institutions (MFI) and dedicated equity funds are fledgling instruments and reach only a small percent of Latin Americs's rural population - let alone the Amazon. In 1999, the share of microentreprises with an MFI credit[121] was 3.88% in Equador, 3.55% in Colombia, 2.7% in Peru, 0.33 in Brazil, 0.07 in Venezuela, and an interesting 27.03 in Bolivia. Yet microenterprises are very important in Latin America's economies which produces about 20% of the GDP with micro and small enterprises producing 40%. In Brazil, Banco do Nordeste (a state development bank) runs a successful micro-credit program serving the poor areas of the region with more than 100,000 clients. Yet when compared with the 19 million microentrepreneurs in Brazil[122], one can see that they are poorly served by credit.

Payments for Ecosystem Services (PES) schemes - defined as a contractual transaction between a buyer and a seller of an ecosystem service or a land use/management practice likely to secure that service[123] - are even more novel and involve fewer people[124]. All have also

[119] Ibid.
[120] "Finance for Sustainable Development: testing new policy approaches", United Nations Department of Economic and Social Affairs, 2002.
[121] « The Microfinance Experience in Latin America and the Caribbean », Alvaro Ramirez, IADB, 2004.
[122] Ramirez, 2004.
[123] « Recommendations on Payments for Ecosystem Services in Integrated Water Resource Management", UN Economic Commission for Europe, 2007.

encountered a number of barriers, the most significant of which are 1) the difficulties global investors have in identifying good projects and capable MFIs to undertake them, 2) the high transaction costs which MFIs face in structuring and monitoring many small loans and grants, 3) the lack of private and local government capacity to serve as PES intermediaries, and 4) insufficient awareness of PES on the part of investors/beneficiaries. Where there is awareness (and available financing) there is a lack of knowledge of actors up and down the "value chain"[125] for investors to make the necessary commitments.

It is increasingly recognized that there are close linkages between the management of natural resources, the sustainability of production systems and societal well-being.[126] These important but often neglected linkages, inform valuation exercises that seek to identify their non-priced benefits, as an argument for reinforcing natural resources management[127]. The flows of services such as pollination, water purification, nutrient cycling, genetic variation and climatic regulation are the underpinning of sustainable agroecosystems and healthy forests. The problem is that although tools and techniques are available to value such ecosystem services, their contribution toward determination of market prices and incentives is rarely assured. For example Brazil has introduced innovative economic instruments related specifically with biodiversity conservation like compensation payments provided by the Sistema Nacional de Unidades de Conservaçaõ (SNUC) which requires that major facility investments, whether public or private, should provide compensatory payments to support national parks and reserves systems at a minimum of 0.5% of investment cost[128]. While important to finance protected area maintenance and expansion, these tools are not adequate to mitigate impacts of frontier expansion[129] where financial tools are needed to reward sustainable resource users.

Donors and governments now perceive the need to adopt these incentive mechanisms as means to complement command and control systems to internalize environmental values in productive practices. To do so successfully though, requires a profound understanding of (i) production and commercial possibilities in their cultural setting, (ii) the linkages between these options and ecosystems incentive mechanisms, (iii) means to articulate consumer interests with ecosystem products and services so as to add value, and (iv) focus on concretely viable economic activities[130].

This paper is arguing that a major reason for development interventions - even when of high quality - having notoriously failed to achieve their impacts is because they mostly do not link their activities to the entrepreneurial and investment tools that would lead to future autonomous financial sustainability (donor independence), while supporting livelihoods. This is surprising in that there has been - for the reasons explained above- demonstrated interest from the financial community in linking the investments of its clients to an initiative such as GEFAM, which has the potential to identify a regional pipeline of "bankable" projects, thereby increasing the propensity for success and reducing transaction costs. For example, in

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[124] UNECE define Ecosystem services as including provisioning services such as food, water, timber and fibre, regulating services such affecting climate, floods, disease, wastes and water quality, cultural services providing recreational, aesthetic and spiritual benefits, and supporting services such as soil formation, photosynthesis and nutrient cycles (UNECE).
[125] « Microfinance », Symbiotics, 2006.
[126] The Millennium Ecosystem Assessment (MEA, 2005) highlighted both the importance of ecosystem services and the implications for human development of its progressive impoverishment due to continued loss of critical natural capital.
[127] « Les instruments financiers de conservation », Ecosystem Management Conservation CI, UNESCO, gtz & DDC, 2005.
[128] « Incorporating Global Evironmental Services Values into to Community Biotrade Enterprises in Brazil (GESV)», GEF-UNEP, 2007.
[129] The Amazon frontier has been defined by de Almeida as the process whereby specific new territory is incorporated into an economy.
[130] GESV, GEF-UNEP, 2007.

2005, another UNEP-GEF project[131] aiming at removing barriers to the development of renewable technologies through the assessment of risk management instruments[132] has been financially supported by Sustainability Investment Partners – a group composed of leading financial institutions such as UBS, Credit Suisse, Gerling, Sustainable Asset Management and SwissRe. GEFAM in particular is working with Symbiotics –a Geneva-based MFI – specifically looking at how the project could help identify and create where necessary other Amazonian microfinance institutions capable of reaching micro and small enterpreneurs in the region, whom they could investment in.

The scenario process will close the information gap along this value chain, especially between upstream investors and intermediaries and between intermediaries and sources of innovation (principally the TDA-SAP, but also best practices and technologies coming from the private sector). Potential investors will be introduced to intermediaries and will be appraised of the commitment and progress of the TDA-SAP. Investors and intermediaries will be exposed to specific opportunities for community-based interventions linked to the investigation carried out by the TDA-SAP.

3. Development Finance

While the limited allocation of the GEF has set aside US$1 million - out of a total of US$10 million - for the development of a shared Amazon Basin Vision, GEF financing rules require a minimum of 1:2 co-financing from other sources. While that may seem a relatively modest amount to commit, it is surprising to see that no donor agency (multilateral, bilateral or private foundations) seem to have strategies allowing them to finance long term planning exercises required to the build the foundation for PPP development and financial sustainability . Political support for the project has been very good[133], technical reviews have praised its innovative approach[134], funding interest from various donors (including participating ACTO countries) has been indicated for future sector or country specific aspects of the SAP implementation stage; but financing the development of a long term shared Vision doesn't fall within anybody's mandate.

As has been mentioned before, we see two reasons for this situation -continued compartmentalization and lack of tools to deal with complexity – which need to be put back into the Amazon context. With regards to compartmentalization, what part I of this paper has showed is that it is environmental issues that has mobilized international attention towards the conservation of the Amazon, especially forests (what Lopez calls the "greening of the Amazon"). Yet we have seen that there are many processes at work within the Amazon Basin that function in superimposed systems depending on changing variables and which has led to a marginalization of social aspects compared to environmental ones[135].

[131] « Assessing financial risk management instruments for renewable energy projects », UNEP-GEF Project ID 2538, 2005.
[132] Risk finance instruments include contract, insurance/reinsurance, alternative risk transfer, contingent capital and credit enhancement capital. An indicative list of instruments can be found in the project document (ID2538).
[133] Here GEFAM spefically received unequaled political support from the Swiss Federal Office for the Environment (FOEN) at the various Council meetings but also provided input during the project preparation.
[134] See STAP review of GEFAM : http://stapgef.unep.org/. The STAP is the Scientific and Technical Advisory Panel of the GEF.
[135] Lopez, 2000.

In this context it is interesting to note that while the GEF is probably the only available multilateral financing mechanism trying to deal with development in an integrated way[136] it is still called the Global *Environmental* Facility and not the Global *Sustainable Development* Facility. As such, when a GEF project seeks co-financing as required by one of its organizing principles, it almost invariably ends up on the desk of governmental environmental sections (be it ministries or development cooperation), which tend to be grossly underfunded for one, and which in turn are themselves structured in ways that doesn't allow integrated project such as GEFAM to fit into anyone strategic priority[137]. Additionally the trend of development agencies over the past decade, notably Canada, to structure aid around "countries of concentration" makes it difficult for projects like GEFAM which deals with so many different countries, to find its place.

The second issue is the one of the longer term and complexity, which should have led to the restructuring of international institutions. It is extremely difficult to create the necessary conditions for such a fundamental organizational transformation. Making key decisions based on shared understandings of interrelationships and patterns of change require the use of adequate tools, and those have been painfully lacking in most of our institutional structures, especially multilateral ones. So while the initial representation of sustainable development was an attempt at integration, it is still linear thinking that has dominated most mental models used for critical decisions making, which might explain why our institutions are ill equipped to invest in long term strategic planning.

Yet, paradoxically, it is in response to the many criticisms[138] that cooperation agencies do not finance long term planning exercises, which comes back to the point of how institutional efficiency is accounted for. "The world of development finance is twice cursed. The persistent and deepening crisis about the amount of finance available for development assistance is compounded by the growing doubts about the efficacy, or even appropriateness, of the use to which these limited resources are put"[139]

A very interesting example related to aid accountability and timeframes in the case of the GEF, has been its effort to introduce monitoring and evaluation (M&E) frameworks to report on project and program outputs, outcomes and impacts, which in turn led to long semantic and definition debates[140], until the newly "independent" GEF M&E office specifically called for an effort in using OECD/DAC terminology[141]. While the glossary of key terms defines project impacts as "the positive or negative, primary or secondary long term effects of a development intervention, directly or indirectly, intended or unintended", the M&E office still

[136] The mission of the GEF is to provide grants to development countries for projects that benefit the global environmental and promote sustainable livelihoods in local communities.

[137] For example when GEFAM seeked co-financing from the Swiss SDC, it was unclear who the project should turn to as there was several relevant (but separated) divisions dealing with Natural Resources and the Environment; Social Development; Global Issues and Sustainable Development; as well as a Latin American division. Additionally the SDC has a number of focus themes of which the Environment and Water for example are different focuses. This being a GEF project though it was eventually directed to the Division of Natural Resources and the Environment, which in turn doesn't deal with the social aspects –like developing a Vision - that GEFAM needs to get financed first.

[138] Numerous references to the long standing issue of effectiveness of aid can be found in Nadil 2002.

[139] « Financing Sustainable Development : Crises of legitimacy », Adil Najam in Progress in Development Studies 2,2 (2002) pp.153-160.

[140] In response to Council requests, in 2005 the GEF division of UNEP developed a model M&E Framework based on standard management processes and definitions from ISO and its American pendant the Project Management Insitute, as well as OECD/DAC sources; which associates different management processes to specific decision-making needs; and where clearly independent evaluation is a process that should take place after the impacts of a project have had a chance to materialize.

[141] « Glossary of Key Terms in Evaluation and Results Based Management », OECD –Development Assistance Committee, 2002.

imposed "mid-term" evaluations of projects - when clearly impacts won't have had a chance to materialize – while on the other hand, long term post-project impact evaluations hardly exist. This is occurring because "up-stream" of projects, adequate M&E processes[142] are not implemented to account for outputs, outcomes, lessons learned and indicators. Additionally it is interesting to note that while OECD/DAC explicitly mentions that the credibility of evaluations depend on how independently they have been carried out, the so-called "independent" M&E office of the GEF is still funded by GEF monies.

So, in their efforts to show results aid agencies have reduced the time span of their investments and are reluctant to engage in what they call software projects[143], because it would imply the rethinking of their own structures. It would induce "relevant and compelling information flowing in new ways to new recipients, carrying new content, suggesting new rules and goals […], and systems strongly resist changes in their information flows […] because [they are] uneasy about relying on soft tools"[144]. Yet, this is the only way to deal with the longer term in a responsible way.

"One surprising by-product of the scenario planning process is increased responsibility. This comes not from virtue but solely from the ability to engage in longer periods of time. Rigorous long-view thinking makes responsibility inevitable because it responds to the slower, deeper feed-back loops of the whole society and the natural world".[145] "Responsibility these years, means mastering long lead-times, long lag times and hidden effects of cumulative change and shared visions address one of the primary puzzles that have thwarted efforts to develop system thinking in organizations: how can a commitment to the long term be fostered?"

This section is suggesting that in contrast to what is currently being done, development finance should be directed towards projects whose purpose are to create the enabling socio-economic conditions for development strategies to be implemented; and that they should do so by engaging the private and the financial sectors to take on implementation, which is the only way for development interventions to become donor independent. But for this to be realized, adequate system thinking tools must be available.

[142] Such as risk management, monitoring and control, review, internal evaluation etc.
[143] This is the exact terminology used by the Swiss SDC in declining financial support for the GEFAM Vision, while still indicating funding interest for future SAP implementation.
[144] « Limits to Growth : the 30-year update », Donella and Dennis Meadows, Jorgen Randers, Chelsea Green Publishing Company, 2004.
[145] "The clock of the now: time and responsibility", Steward Brand, Wiedenfeld and Nicholson, 1999.

CONCLUSION

THE LONG TERM PARADOX

"Civilization is revving itself into a pathologically short time span. This trend, which originates in the accelerating changes in technology, the short-term perspective of market-driven economics, the next election priorities of democracies and the distraction of personal multi-tasking, is on the increase[146]*. Some sort of balancing corrective to short-sightedness is needed, yet it might simply not be possible to convince human beings rationally to take the long term view"*[147].

The fact that is it so difficult to find adequate but reasonable financing for a long term planning effort in an ecosystem of the amplitude and of such crucial importance as the Amazon River Basin - from perspectives of geo-political, environmental, business and financial interests - is symptomatic of the fundamental flaw in the way institutions approach sustainable development. Exactly twenty years after the publication of the report of the World Commission on Environment and Development (WCED) "Our Common Future", governance institutions have still not picked up on long term systems thinking tools necessary to restructure in less fragmented ways over the longer term, which in turn is paralyzing the multilateral efforts called for by the report.

This paper has tried to illustrate the "catch 22" situation in which GEFAM is finding itself when it comes to financing a long term Vision in the Amazon River Basin using a systems thinking methodology such as scenario planning. In a first part, we presented the many risks associated with the integration of such a sensitive region and the necessity to scientifically assess cumulated human activity impact on the one hand; on the other hand, we have tried to demonstrate that the complexity of the various systems at work in the Basin requires the use of an adequate risk mitigation tool to develop a shared Vision.

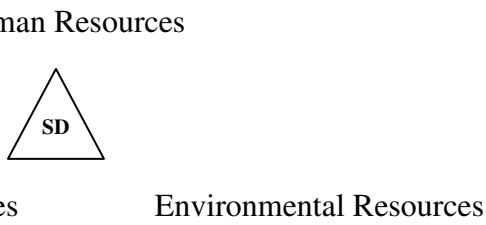
In a second phase the paper introduced scenario planning as a useful tool to build that Vision – a necessary step to reduce the difficulty of collective action in a complex and uncertain context – from where pertinent associated strategies can then be derived; and we have seen that the multi-stakeholder nature of scenario planning will specifically target public/private partnerships in the development of these strategies.

In the third part, we tried to show that the difficulty of financing such a long term planning effort –even in a context as crucial as the Amazon Basin – is a result of a flawed approach to sustainable development, which doesn't take into account the financial sector. As a result development cooperation does not invest in the right places along the financing value chain system (like in long term planning or other places capable of creating a leverage effect), and consequently does not allow projects to become donor independent, i.e *sustainable*. "Sustainable development also requires new concepts of international cooperation"[148]

[146] Ibid.
[147] The fifth discipline: the art & practice of the learning organization", Peter Senge, Doubleday/Currency, 1990.
[148] "Aspects of International Cooperation for Sustainable Development" N. Fenzl, A. Mathis, L. Lukesh & H. Payer, www.amazonia21-org.

Finally, in order for continued thinking on a possible sustainable development model this paper would propose that thinking around resources might be more useful than thinking around sectors, like the model below suggests.

Alternative Sustainable Development Model



Not only is this the only way to permit any sort of objective measurement (for which monitoring and reporting initiatives are indispensable), but it also forces the thinking about finance for development out of its "entrenched orientation as a financing regime" alone –the means (financing) being decoupled from the end (sustainable development)[149].

[149] Najam, 2002.

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ANNEX I – Amazon Area Definition

Area definition from the EC-ACTO Expert Group[150] (reproduction).

The definition of the area of Amazonia was elaborated and it was agreed upon to use essentially the following three criteria:

1) an **hydrographical** criterion, based on the total extent of the Amazon Basin (including the Amazon and Tocantins river systems) which forms the central constituent of the definition;

2) an **ecological** criterion, subdividing the Amazon Basin (as defined above) in three subregions, which are linked together by strong ecological and functional connections, although belonging to three different ecoregions;

3) a **biogeographical** criterion, complementing the formerly defined area by using as an indicator the known historical extent of the Amazon lowland rainforest biome in northern South America (taken or inferred from TREES map 1999; S and E borders delimited according to Soares,1953).

As a result, the delimitation of the Amazon Region made by the European group of experts has been accomplished in the following three steps:

1st step: Definition of a strictly hydrographically delimited Amazon Basin:

> **I - Amazon Basin**, this includes the entire drainage basin formed by the river network of the Amazon and the Tocantins river basins, extending in Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela, from all the watersheds down to the outer mouth of the river delta (incl. the brackish water ecosystems).

2nd step: Definition of three ecologically and biogeographically based subregions (Amazonia, Andes, Planalto) within the first unit I:

> **Ia - Amazonia *sensu stricto***, the area of the Amazon and Tocantins river basins dominated by the Amazon lowland rainforest biome (including also minor other, forest and non-forest vegetation types and their associated fauna);
> **Ib - Andes**, extending along the eastern slopes of the Andean Cordillera between Bolivia in the south and Colombia in the north, from 700 m asl upwards to the actual watershed;
> **Ic - Planalto**, located on the northern slopes of the Brazilian Shield and of the Bolivian central plains of Santa Cruz; this subregion extends along the southern Amazon rainforest limit and the southernmost watershed limits of the Amazon and Tocantins river network and meets eastwards the upper Mearím River in Maranhão.

[150] "A proposal for defining the Geographical Boundaries of Amazonia", EC- JRC & ACTO, Office of Legal Publication for the European Communities, 2005.

3rd step: A biogeographically based definition (cover of Amazon lowland rainforest biome) of two additional subregions (Guiana and Gurupí), external to unit I:

> **IIa - Guiana**, comprising the Guiana region of Venezuela, parts of Colombian Amazonia, the three Guianas and the northern part of the state of Amapá in Brazil, including the sandstone and granite mountains of the Guiana up- and highlands and the enclosed area north of Guri;
> **IIb - Gurupí**, including the river basins between the lower Tocantins and the Mearím/Pindare rivers draining into the Atlantic Ocean in Brazilian northeastern Pará and western Maranhão.

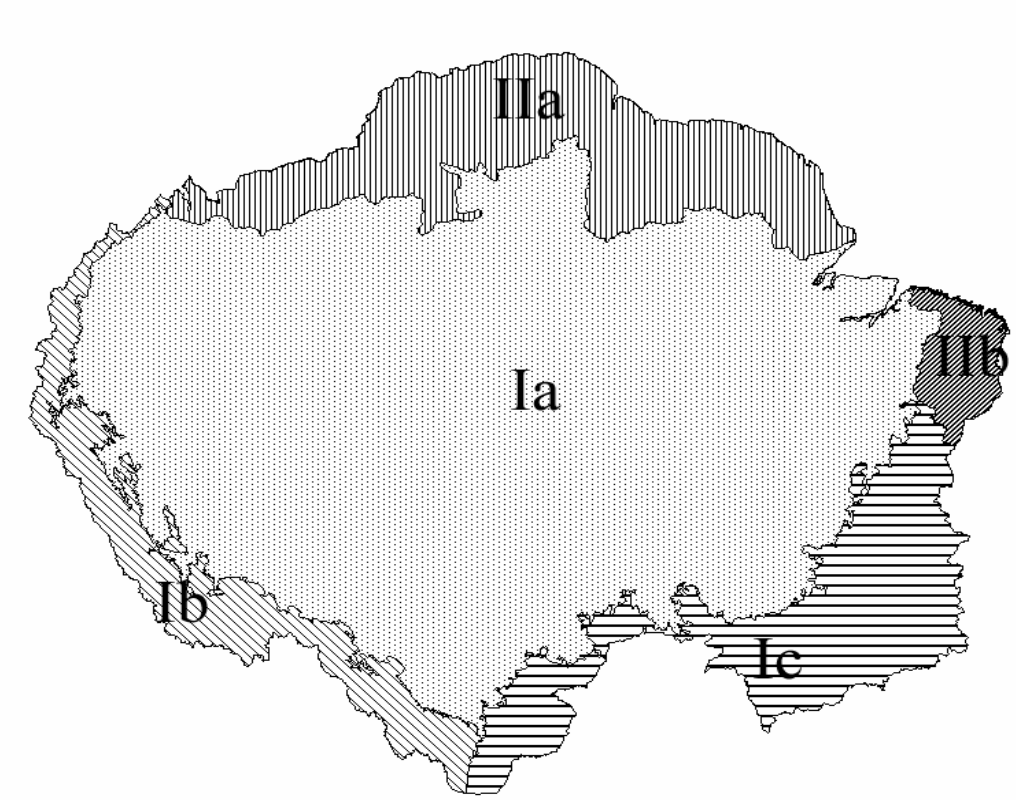

Figure : Subregions of Amazonia elaborated by the expert group. Note terms in square brackets are suggested names.

UNIT I = Amazon and Tocantins river basins ["*Amazon Basin*" or "*Hydrographical Amazonia*"]
Ia = Lowland rainforest biota of the Amazon and Tocantins River basins ["*Lowland Amazon Basin rainforest*" or "*Amazonia sensu stricto*"]
Ib = Andes (non-lowland biota of the Andean Amazon Basin, > 700 m asl)
Ic = Planalto (non-lowland biota of the southern Amazon Basin)
UNIT II = Amazon lowland rainforest types outside Unit I
IIa = Guiana
IIb = Gurupí
Ia + IIa + IIb = Entire Amazon lowland rainforest biome ["*Hylaea*" or "*Amazonia sensu lato*"]
I + II = Amazon and Tocantins river basins + Amazon lowland rainforest biome outside the basin
["*Amazonia sensu latissimo"*]

ANNEX II – Amazon Region Map

Source: EC-JRC/ACTO

ANNEX III – Amazon Scenario Process Table