Clean Development Mechanism and distributional issues: an analysis of the Brazilian certified projects

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Clean Development Mechanism; certification of emission reduction; environmental markets; economic development; sustainable development; distributional issues; Brazil

Abstract
This paper´s goal is to analyze which the contribution of the Clean Development Mechanism projects for the sustainable development of host countries and so contribute to the discussion about its vocation: just reducing the costs of developing countries to adapt their industry and energy sectors to climate change pressures or also allowing some equitable and distributional improvement? For this purpose it reviews the projects approved in the last two years in Brazil and analyses then in accordance to some sustainable development indicatives defined in the paper.

1. Introduction

Scholars and policy makers are very enthusiastic about environmental markets. This kind of tool is seen as a reconciliation of the environment protection with economic efficiency, as a better way to give an answer for the need of compensation either for negative or positive externalities related to the use or preservation of natural resources. The Clean Development Mechanism (CDM) would be an example of such sounds environmental markets.

In order to create a market for the environmental protection some kind of tradable property rights must be created. In a rough synthesis, the CDM converts the environmental conservation enhancement of a project – that is a public good – in a private good that can, through the Certification of Emissions Reduction (CER) system, be traded between parties.

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The CDM is also aimed at helping developing countries adapt to climate change while meeting their economic and social needs in the way of the so called sustainable development. The sustainable development concept, on the other hand, encompasses the goal of reconciling environmental, economic and social goals as a way to achieve inter and intra generational equity. Policies that fail to account to any of these goals will lead to poor results in terms of environmental protection and/or poverty reduction.

Taking seriously the sustainable development requirement into consideration, means that an analysis should be done of the role played by the CDM - as part of a broad climate change policy - for either contributing to increase economic development (by means of technologic transfers, i.e.) or to promote poverty alleviation.

The present paper analyzes the projects that have been certified in Brazil in the last two years verifying specifically: 1) if its contribution to the sustainability is limited to economic and environmental aspects, or if it includes specific social gains 2) which kinds of economics and social gains it has been allowing in the last years.

It´s goal is to contribute for the discussion about the role played by CDM in the climate change policy: just reducing the costs of developing countries to adapt their industry and energy sectors to climate change pressures or also allowing some equitable and distributional improvement. For this purpose, it begins with a short overview of the Kyoto Protocol and CDM rules. Secondly, it discusses the meaning of the concept of sustainable development, that must be interpreted in accordance to the discussions in it´s origins and to it´s aims to involve developing countries in the environmental protection. Then it describes the methodology of the paper, more specifically the indicatives chosen to analyze the contribution of CDM projects to the sustainable development and, finally, shows the figures of the reviewed Brazilian projects in accordance to the indicatives.

2. **The Clean Development Mechanism**.

The Climate Change Convention signed in 1992, in Rio de Janeiro established obligations for the signatory countries related to the reduction of the emissions of greenhouse gases (GHG). The definition of specific levels of reductions to be achieved by each country however was subject of a later treaty – the Kyoto Protocol of 1997. The Climate Change Convention is considered a framework convention because it outlines broadly the Parties obligations in connection to climate change mitigation but

required a futher ruling by other treaty, the Kyoto Protocol. The UNITED Nations Convention on the Law of Treaties of 1980 allows a subject to be ruled by two or more connected treaties as is the case in the climate change regime. The Framework Convention created a body named the Conference of the Parties (COP), which shall create and define strategies and rules for the reduction of GHG emissions. The COP has defined important rules about the process of CDM projects approval as well as the accounting of emissions reductions from the different activities.

The Kyoto Protocol requires developed countries and countries with economies in transition to market economies (Annex B Countries) to reduce their total GHG emissions to at least 5% below 1990 levels during the first commitment period, from 2008-2012. Such target may be achieved through sources reduction of greenhouse gas emissions or through removals by sinks resulting from direct human-induced land-use change and forestry activities. There are no obligations for developing countries to reduce its emissions during the first period, in result not only of the lack of consensus for this purpose but of the consideration of the "common but differentiated responsibilities". Said principle is related to the idea that most industrialized and economic developed countries contributed strongly to the environmental problems that leads to climate change during their development process. Therefore, they should bear a greater part of the responsibility for the measures to combat them.

There are flexible mechanisms in the Protocol in order to help Annex B parties achieving its commitments. The Emissions Trading, that allows them to acquire carbon units from other Annex B countries, the Joint implementation, when projects between two or more Annex B parties may be implemented in one of them and, finally the Clean Development Mechanism (CDM) in article 12, establishing that Annex B parties may attain their emission targets by implementing projects in non-Annex B countries. The projects shall assist developing countries in achieving sustainable development.

The CDM projects shall allow the achievement of other goals of the Kyoto Protocol, such as the transfer of cleaner and safe technologies. As established in Article 10, all parties, taking into account their common but differentiated responsibility for climate change mitigation, shall promote facilitate and finance the transfer or the access of technologies, know how, practices and process environmentally safes. There are some requirements for the approval of CDM projects: a) the Parties involved must participate voluntarily; b) there must be real, measurable and long-term benefits to mitigation of climate change; and c) reductions in emissions shall be additional to any

that would occur in the absence of the certified project activity. The fulfillment of those requirements, the amount of the emissions reductions (or GHG absorption) as well as the contribution for the sustainable development of the host country are carefully examined in the approval and certification of projects process.

In addition to activities that promote GHG emission reductions, emission targets of Annex B parties may be achieved by removals by sinks resulting from direct human-induced land-use change and forestry (LULUCF) activities. The Kyoto Protocol limits them to afforestation and reforestation (article 3). The Protocol allowed the Conference of the Parties to define other LULUCF activities what was done at COP-7 in Marrakesh. The Marrakesh Accords established that parties may choose to account for activities including forest management, cropland management, grazing land management and revegetation at the Emission trading and Joint implementation mechanisms. However, within the CDM, eligible LULUCF activities have been restricted to afforestation and reforestation, at least for the first commitment period. However, the COP adopted special simplified rules for the approval of small scale afforestation and reforestation projects COP-14. Other small scale CDM projects are also submitted to simplified rules, in order to reduce its cost.

As already exposed, all CDM projects, including LULUCF activities, must show a contribution to the sustainable development of the host country, in addition to the other requirements related to the prove of GHG removal from the atmosphere in order to be approved.

3. Sustainable Development. What does it means?

The concept of sustainable development was described in the 1987 United Nation Commission on Sustainable Development Report entitled “Our Common Future” as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Vague as it may be, such concept allowed a consensus between developed and developing countries which views of the relationship between development and environmental protection have been in odds since the Stockholm Conference of 1972. Such consensus led to an improvement of the international cooperation in environmental matters as well as the institutionalization of them in the international diplomatic agenda (NOBRE and AMAZONAS, 2002:41).

The comprehension of what sustainable development means requires a look back to the initial discussions of the Environmental protection at the international scenario in the seventies. That decade saw the Environment get into the agenda of the developed countries. However, there was a lot of disagreement between the countries of the North and South Hemispheres about the paths to deal with its protection in the future. The main issue of contend was the perspectives for the economic development and industrialization in the South.

Perhaps one of the most conflictive moments of the discussions has been the publishing, in 1972, of the book *The Limits to growth*, resulting from a study coordinated by Dennis Meadows, sponsored by the Rome Club. *The Limits* presented a Malthusian analysis of the finitude of natural resources in relation to the population and economic growth. The book was extensively discussed in the Stockholm Conference of the same year and the debates were based on the zero growth idea that triggered the fierce opposition of the developing countries to the environmental questions.

The further works of the United Nation Environmental Program (UNEP) will lead the discussions in the direction of a reconciliation of the ideas of environmental protection and development, characterized by the concept of “eco-development”. This last is said to be defined by Maurice Strong, the first president of the United Nations Environmental Program (UNEP). It was refined by Ignacy Sachs during the seventies. The idea of eco-development requires the recognition that the use of natural resources must respect ecological constraints, must promote the improvement of the life conditions and finally, create paths of development that takes into account local or regional cultures or, at least, local and regional arrangements for development (NOBRE and AMAZONAS: 2002, 35).

The trends in the debates about development, on the other hand, focuses on its relationship with democracy, as a mean to afford access to the exercise of civil rights, as well as the transparency and accountability of government activities (SACHS: 2004, 81).

Although the broadness of the concept of sustainable development did not change, its interpretation needs to dialogue with the debates and discussions at its origin and with current discussions about development policies. It implies the need of reconciliation of the environmental, economic and social dimensions of the development as a way to achieve inter and intra- generational equity. This is an important aspect to be pointed out, because it may be easy to think about sustainability

as a concept that only interrelates the environment and the economy. Such limited approach could result in policies that are not able to produce equitable and distributional results, as would be desirable.

A policy, on the other hand, is built based on different instruments and mechanisms. It is the implementation and combination of them that lead or not the achievement of its aims. The policies for the sustainable development may use market mechanisms, using the efficiency of this last institution to achieve innovation and incentive for the environmental goals. Other tools may be aimed directly to distributional issues, as the fund transfers for classes, regions or countries in order to alleviate poverty, but it would be interesting having regulatory measures that lead market mechanisms to produce some equitable results in addition to the efficiency ones.

The CDM is an example of market instrument able to induce private parts to the environmental protection, reducing its costs to do so. However, since it was included in the international regime of protection against climate change to allow the sustainable development of developing countries, an analysis should be done of its vocation to accomplish such goal.

4. The Clean Development Mechanism and Sustainability. Description of the paper methodology.

In order to do the analysis of the vocation of the CDM for the sustainable development, the present paper aims to answer two questions: 1) is its contribution to the sustainability limited to economic and environmental aspects, or does it includes specific social gains? 2) which kinds of economics and social gains it has been allowing in the last years?

An answer to such questions can not be provided in abstract. The CDM allows individual projects to be approved and certified for the emission of a Certification of Emissions Reduction. Therefore, to analyze the vocation of the mechanism, a review of the approved projects is necessary. This paper was based in a collection of the CDM projects approved in Brazil in the years of 2006 and 2007 – totaling 114 projects - that were analyzed with respect to some information that would allow a discussion of its contribution to the sustainable development.

The concerns about effective contribution of CDM to the sustainable development as well as a methodology of collection of information about the approved

projects have been subject of studies from other academic areas. The International Institute for Sustainable Development did a comprehensive analysis of CDM projects around the world in order to verify the “development dividend of the projects” , defined as “benefits to developing countries beyond those strictly related to climate change, in the areas of economic growth through investment; technological evolution; poverty alleviation; environmental and human health improvements.” (COSBY et al: 2006,1). This cross- country comparison provided interesting conclusions about equity gains of CDM not only within the countries but also among countries vis-à-vis its level of development and income. Of course the aim of the present paper is much more modest and the scope of its research much narrower.

Although the interpretation of the sustainable development indicates that it is composed of environmental, economic and social aspects, as discussed in the section 2 above, it is still very broad to be applied in specifically analysis. Therefore, in order to investigate the contribution of the Brazilian projects for the sustainable development some indicatives to it have been chosen in this paper.

The choice of such indicatives followed two directions. The first one is related to the benefits CDM should ideally bring to the idea of sustainable development in all its aspects. This direction does not take the reviewed projects information into consideration, in order to allow a critic view of them and, especially, of its lacunas.

This first group of indicatives should allow a perception of the contributions of the projects for traditional communities or small farmers and for arrangements that allow local and regional development, as a deep understanding of the sustainability concept would require. In addition, due to the fact that less developed countries in tropical areas are very rich in biodiversity and have difficulties to preserve it, a problem that is remarkable in the Brazilian case. For this purpose, the indicatives should allow a discussion of CDM capacity to benefit directly biodiversity preservation.

The second group, on the other hand, departures from the information presented at the projects as a way to overview their specific contributions to the sustainable development and accounts for questions such as technological transfers, creation of jobs and participation of relevant actors in the certification of the project process.

It should be mentioned that the indicatives have been defined taking the discussions of sustainable development into consideration. Although some problems and challenges are common for all countries struggling against poverty and economic underdevelopment, the specific levels of some problems as well as the existence of

successful policies and features in direction of development may differ deeply among developing countries. Therefore, the indicatives below may apply generally to developing countries, but the justification for their choice are based in the Brazilian context: its large forest resources, the challenge to provide for a sustainable development of its Amazon region, its significant industrial activity, and a high level of poverty.

The indicatives are the following:

1) First group:

1.1) Biodiversity protection

There are significant relations between climate change and biodiversity, since they mutually contribute to each other. Forests can capture significant quantities of carbon from the atmosphere and store part of this carbon in soil and vegetation but can also significantly contribute to GHG emissions when they are cut, burned, or destroyed, either due to anthropogenic or natural causes. Forests activities may include:

a) The preservation of forests. It helps to maintain stored carbon in forest vegetation and soil and avoid the release of significant amounts of them into the atmosphere and also has considerable benefits for biodiversity conservation. The remaining primary tropical forests contain 50% to 70% of all terrestrial plant and animal species. Forest preservation, particularly in the tropics, is vital for biodiversity conservation. (SAGEMULLER: 2006, 198);

b) Afforestation is the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources.

c) Reflorestation is the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land.

d) Forest management. Techniques that enhance carbon sequestration such as the extension of rotation cycles, selective harvesting, reduced-impact logging.

Afforestation and reforestation can have positive, neutral, and adverse impacts on biodiversity, depending on the site and the species used for planting. Forest management techniques, on the other hand, have positive impacts on biodiversity (SAGEMULLER: 2006,200). Besides it require the involvement of local communities with is a fundamental basis for sustainable development

There are well known problems related to the accounting of the amounts of carbon forests sinks can remove from atmosphere and that doubts caused a limitation to its acceptance in the Kyoto Protocol system. However, incentives to forestry activities through intensification and broadening of its possibilities under the CDM could make some forest activities economically viable in countries with rich biodiversity as Brazil. In addition, these activities could be more inclusive of local communities, as will be discussed in indicative number 1.2 below.

1.2) Building of adaptative ability of communities

As discussed in Section 2, above, the sustainability requires the development of local and regional strategies and arrangements. Of course the economic growth and modernization of some sectors of the economy are important elements of the economic development, but it should not destruct local strategies that are usually based on a strong relationship of communities with the environment and cultural characteristics. On the opposite, economic growth needs to be compatible with them. But that requires policies to protect such communities and its relation to the environment, such as providing them alternative of income generation from its stewardship of the natural resources. The adaptative ability of communities may also avoid perverse processes of urbanization moved by a lack of living possibilities in rural or distant areas as well as allow them to increase its life standards without increasing the level of traditional economic activities.

The referred study of the International Institute for Sustainable Development did include that element among the social criteria for the definition of the development dividend of CDM projects. (COSBEY et al: 2006, 14)

CDM projects may allow an adaptative ability building when allow communities the ownership of project or technology or capacity building to replicate technologies. This paper did not consider projects that promote programs of environmental education or other social responsibility activities as projects that contributes specifically for the adaptative ability of communities because they do not allow communities arrangements

to be maintained and are related to the installation of an “external actor” in the community.

2) Second group

2.1) Creation of permanent direct jobs

The creation of formal jobs is an important element in a country with high level of poverty. Although the development process requires also investment of the State to improve basic public services such as health and education, the elevation of the employed population and of the aggregate national income is one aspect of the development.

In Brazil, income transfer programs as well as an economic growth in the last five years, allowed a reduction of the poverty levels. However, there is a great deal of discussions about the need to include benefited population in the income programs in the market. Although there is no element that allows a conclusion that this contingent will be employed in the project, the general growth in the job positions is a positive element.

Most projects require work force for its construction or installation but this is no guarantee that people employed temporarily for this purpose will be able to be included in the formal job market after the construction is over. For this reason this paper has taken into consideration only the creation of permanent jobs after the construction and/or installation of the project.

2.2) Elimination of environmental risks for workers and poor neighborhoods

The literature points out the so-called “Environmental Justice” problem related to the unequal distribution of the environmental risks and benefits. Although the environmental protection tends to improve the life standards of people in general, some poor neighborhoods or groups are still exposed to specific risks and inconveniences related to the proximity of waste dumps, landfills, pollutant industries or to dangerous job activities. Of course there is a great deal of discussion about of the accuracy of this analysis, specially whether such inequality are *ex ante*, meaning that decisions of locating undesirable activities would chose poor neighborhoods or *ex post*, indicating

that lower income classes are driven to the proximity of such undesirable land use places because the housing prices would drop in those areas (BEEN: 1997, 107).

In spite of the fact that such criticism was born in the United States, the Environmental Justice problems are even deeper in developing countries were lower classes live in precarious neighborhood that are often unlawfully near to industries or waste dumps. Therefore, the paper does consider as an indicative of sustainable development contribution the improvement related to: a) reduction of explosion risks and air pollutant emission resulting from projects that burns methane in waste landfills or 2) eliminates some occupational risks.

2.3) Scale of the project

Although there is no direct relationship between market power and environmental outcomes, the maintenance of smaller units is a very important element of the market economy for both economic and social reasons, which includes its role as employers and the benefits of the maintenance of local and regional players in the market.

The small scale projects therefore, can help some eligible entrepreneurs to enter into a market or to adapt to the modern environmental requirements of the law and sometimes of the markets.

2.4) Technological transfers

As referred to in 1, above, one of the goals of the Kyoto Protocol is to promote the transfer of technologies and know how from developed to developing countries in order to allow the last ones to promote a development in the way of the sustainability using the better techniques, processes and technologies that are usually created in the developing countries

2.5) Location of the Project in less developed regions of the country

The regional inequalities in Brazil are a result of the concentration of the industrial development in its Southeast and South. Although some industries have been installed in other regions in the recent decade, the Northern and Northeaster part of country still suffer from a reduced level of economic opportunities. The Northern and Central States, on the other hand, are presently areas of frontier expansion and scenario

of a predatory exploitation of its natural resources, lacking a consistent presence of the State. CDM projects can represent alternatives for the lawful engagement in production chains in those states, especially because it requires a proof of its accordance to the environmental law.

2.6) Participation of relevant actors in the approval process

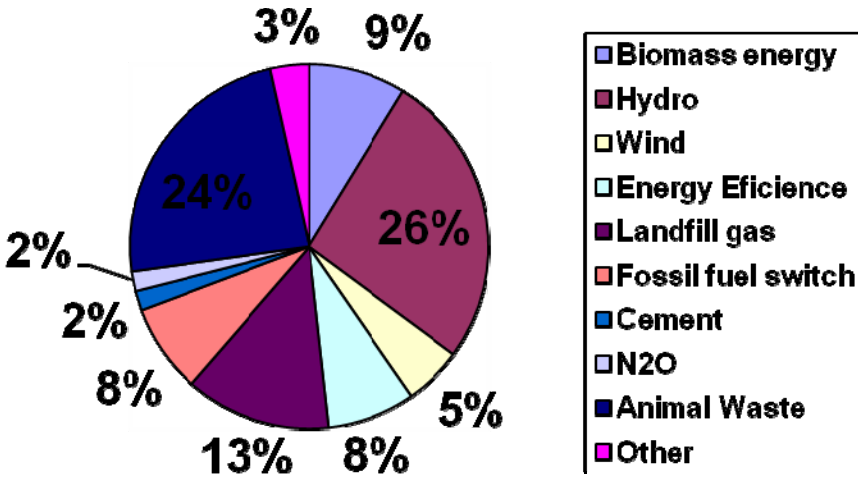
The relations between development and democracy have been present in the discussions of the concept of sustainable development as exposed in 2, above. Although not the unanimity of countries in the world adopted the principles of the Western democracy, the idea of transparency, accountability and public participation of those affected by specific decisions are now aspects defended by scholars focused on development issues. Amartya SEN, for instance, considers the participation and political dissent as a constitutive part of development. The wholly concept of development for the author rejects a definition limited to economic elements to include the dimension of the freedom in a very broad sense that includes the participation. (SEN: 2007, 53).

In addition of such hole participation occupies in the development concept, the environmental law evolution had strongly deepened it through the participation principle stated in the International Environmental Law Declarations. As an indicative of sustainable development, participation is, thus, view as a qualitative element, as an aspect that constitutes the concept of freedom and development of the life conditions, in the sense described by SEN.

5. The CDM projects in Brazil

As an initial step an analysis should be made of the economic sectors that were contemplated with CDM projects.

There are a total of 189 projects approved in Brazil. The first 3 of them were approved in 2004. In the year of 2005, there was an increase in CDM project numbers. As referred in 4, above, this paper reviewed the projects approved in 2006 and 2007 that totaled the number of 114.



That first graphic shows the absence of activities in the reforestation and afforestation sectors that would – arguably- allow opportunities of participation for traditional communities living in forest areas or small farms in order to provide them incomes from the forestation activity.

On the other hand, there is a clear trend of projects that promotes a clearing of energy sources[*] by different activities.

It should be noted that the learning and expertise process of relevant agents in the CDM project markets, such as consulters and other intermediates can be a factor to induce the replication of projects and therefore, the trends toward a concentration on a small number of sectors.

1) First group of indicatives

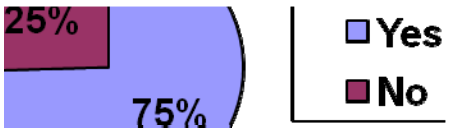
There are no projects with positive results in connection to the indicatives defined in the first group (biodiversity protection and building of adaptative ability of

[*] Although Brazilian electric energy are mainly hydroelectric, the construction of new big generation plants is no longer sustainable because of its impacts on the ecosystems. The construction of small hydroelectric plants are consider a good option and many CDM projects relates to them.

communities). That fact may result of many reasons: The small acceptance of credits deriving from forest activities in Europe and Japan, as well as the economic viability of the projects, since the carbon credits are usually one of its incomes but not the only. The limitation by COP rules regarding forestation activities in the CDM that limits then to afforestation and reforestation activities may play a role too. The simplified approval rules for small scale projects were not sufficient to booster forest projects. Other possibilities of promotion of adaptative ability of communities not necessarily related to forest areas were not contemplated either.

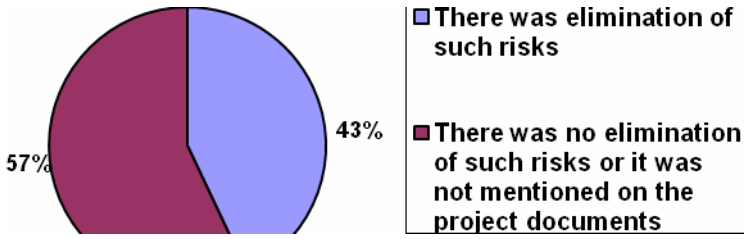
2) Second group of indicatives

2.1) Creation of permanent jobs

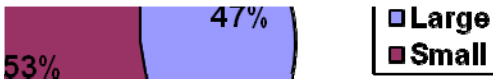


Notes: 1) The number of jobs created was not taken into account, due to the fact that small scale projects usually create an apparently inexpressive number of jobs, which is, nevertheless, relevant when implemented in small towns. 2) Projects that did not specifically mention a creation of permanent direct jobs on their documents were considered as not having created such jobs.

2.2) Elimination of environmental risks for workers and poor neighborhoods



2.3) Scale of the project



The regulation established by the National Authority in Brazil simplifying the rules for the approval of small scale projects and therefore reduce its costs did stimulate them. More of the half of last two years projects wee small scale.

2.4) Technological transfer

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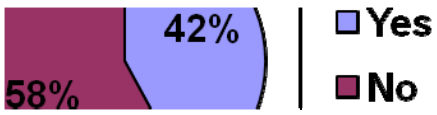
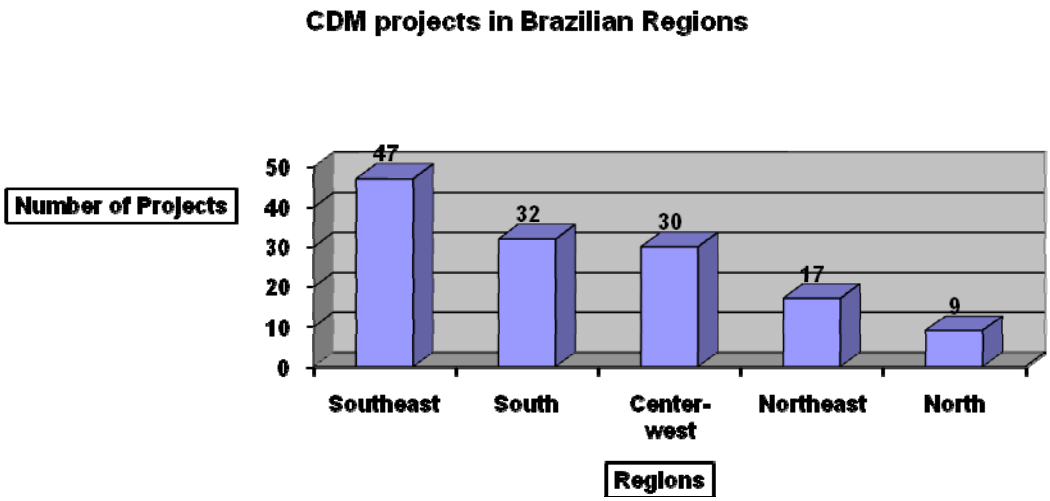


2.5) Location of the Project

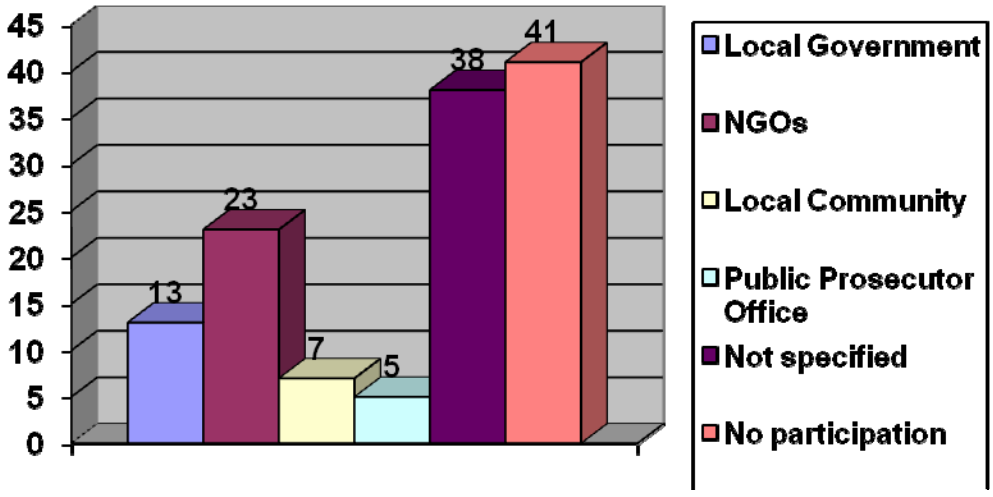


As the graphic shows there is a clear predominance of projects in the Southeast region of the country, which is the most industrialized one, where there are also affluent rural activities. The second richest region is the South, which is also the second region that hosted CDM projects. The Center-west area, however, is an agricultural expansion area, growing very quickly. Although it may be arguable weather a growth should be stimulated or not in such area, in accordance to the

discussion in item 4, above, it is considered positive to offer sustainable activities in such areas, or to provide cleaner energy for the region.

The Northeast and North are the lowest income regions. The general trend in the localization of CDM shows that are being attracted to areas with some kind of economic dynamism and very rarely to less developed ones. In addition economic viability matters another reason for that may be a knowledge process that is accumulated in the former areas. Although the information we have about the reasons for that are incomplete and a comparison must be careful, it is interesting to note that the referred study of the International Institute for Sustainable Development, showed a similar trend in the cross-country comparison. The least developed countries were almost excluded from CDMs projects (COSBY et al. 2006: 4).

2.6) Participation of relevant actors in the approval process



The majority number of projects did not have participation or a specified one. It is interesting to have numbers showing who have been the most active actors in the CDM projects discussions and evaluations.

6) Conclusions

As stated in the Introduction, above, the goal of this paper in to contribute to the discussions of the CDM for the sustainable development. The research scope is too narrow to allow the author to make policy recommendations deriving there from.

The general trends showed in the research is that CDM projects – that grew in number in Brazil in the last two years - tend to concentrate in more dynamic regions and in sectors where learning and expertise are being accumulated quickly. The activities in the energy sectors are predominant. The afforestation and reforestation projects, on the other hand were inexistent. That is a free market trend, showing that eventual policy goals to incentive project in other sectors or regions must be induced by special rules.

With regards to the location of the projects, the Brazilian Southeast region, which is the most economic developed in the Country, is the predominant host of the projects (closed to the half of the total reviewed projects). The poorer regions of the North and Northeast attracted a much smaller number of projects than the Southeast, South and Center-west regions, where there are economic growth and dynamism.

The scale of projects shows that the simplified rules for its approval could produce the effect of its cost reduction and increase its economic attractivity.

With regard to economic benefits of development, in the analyzed projects the job creation was much more frequent than technological transfer.

Finally, the relevant actor's participation is still small, but the analysis of the projects showed that the NGO´s are the most frequent participant.

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