National Plan participatory construction against Soil Erosion in Brazil

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Abstract

With the increased demand for agricultural and forestry products, the pressure on soil and water resources intensifies, leading the world to food insecurity, malnutrition and several socio-economic problems. The challenge imposed is the reversion of this framework through access opportunity and low cost to application of conservation technologies already available for the various levels of land degradation. This project aims to provide guidelines for the participatory construction of National Plan for Sustainable Soil and Water Use in Brazil, a multi-institutional and participatory public policy. The Plan seeks to contribute to the implementation of programs related to degrade areas recovery for environmental restoration and reintegration into production chains, soil and water use, management and conservation. Therefore, strategic, tactical and operational level will count on all social organization level to involve people on this campaign, coming from family nucleus at the field to ministries decision makers. A competence mapping will be also used of be made among the involved actors and proposed participatory methodologies to include the key actors from the elaboration, implementation and development of the Plan. The effective participation of society is expected, contributing to the dialogue with other current public policies and with the United Nations Sustainable Development Goals.

Keywords: Land degradation, Soil erosion prevention, Sustainable Development Goals, Participatory Policy, Society Empowerment

Introduction, scope and main objectives

About 33 % of the world's soils are degraded. Erosion, salinization, compaction, sedimentation, acidification and contamination are among the main problems. On the other hand, when managed sustainably, soil can play an important role, especially for agricultural powers such as Brazil: produce more in the same area while reducing negative environmental impacts and increasing natural capital and water flows environmental services (FAO and ITPS, 2015).

Figure 1: Examples of land degradation - compaction, unproductive soil and sedimentation.

To contain the advance of erosion with the increase of agricultural exploitation in the country, the National Soil Conservation Plan was created in Brazil, which was replaced by the National Program of Hydrographic Microbots (PNMH). Currently, only some States of the Federation have this active Program and there is no National Plan that addresses the integrated management of soil and water resources. Other advances were conquered, such as the institution of the National Soil Survey and Interpretation Program of Brazil (PronaSolos). However, both decrees (PNMH and PronaSolos), which are an important part of the legal framework in relation to soil issues in Brazil, present gaps in relation to the use, management and integrated conservation of soil and water resources.

There are many methods, instruments and technological solutions that could be adopted for the proper use and management of soil and water in rural areas. However, many obstacles still remain for the expansion of more sustainable agricultural production systems, which encourage an increase in the income of the farmer, the quality of the products and the provision of environmental services.

Figure 2: Sustainable technologies to contribute with soil and water conservation.

Given the breadth and diversity of the Plan's action that should cover the entire national territory, it is necessary to establish a structure and instrumentality of governance that considers the strategic, tactical and operational levels. In this sense, the present proposal intends to contribute to the development of methodology of construction, implantation and participative management of National Plan for Sustainable Soil and Water Use. For this, it intends to consider mainly that the knowledge of the existing competences, as well as of the factors that interfere in the adoption of practices of use, management and conservation of the soil and water resources on a large scale are essential for the success of the Plan.

Methodology

Methodology to realize this project will concentrate in three main points:

- Survey and analysis of data and information: The collection of data and information relevant to the subject of the study will be carried out considering the strategic, tactical and operational levels. Identify and analyze similar, complementary and convergent actions already existing and classified in priority levels in relation to their contribution to the Plan. Through consultation with specialists and decision makers through structured questionnaires to address the participatory construction of the Plan, the attributions and goals existing in those documents are classified and reconciled and / or reformulated to meet the premises of the new Plan under construction.

- Mapping of competences: the identification of the set of skills, knowledge and attitudes available to the professionals of an organization and which enables them to carry out certain activities (Pires *et al.,* 2015). It will be carried out initially by a documentary investigation, which includes the analysis of the process, the content of the mission, the vision of the future, the objectives and other documents related to the organizational strategy (Carbone *et al.*, 2005). Afterwards, data collection will be carried out with key people of the organizations to support the documentary analysis (Faria and Brandão, 2003). Other methods and other research techniques can also be used, such as observation, focus groups and structured questionnaires with evaluation scales, as suggested Guimarães (2001) and Santos (2001).

- Selection of participatory construction methodologies: a broad review will be carried out on existing participatory construction methodologies and proposals for adjustments according to the levels of governance addressed (strategic, tactical and operational) and selected participatory methodologies best suited to each segment, enabling more effective participation of technicians, farmers and society in general in the construction of the Plan. Social transformation implies the co-participation of different social actors involved in the process. For that the process of action research, which seeks to know and intervene in a reality, but jointly between the proponent and the beneficiary of the proposals (Thiolent, 1988; Vasconcelos, 1998; Santos, 2003), and considering the historical, ethical, political and socio-cultural dimensions of knowledge in the different Brazilian regions.

Plan participatory construction will be synchronized with main guidelines, which are focus in prevention, conservation, monitoring and recovery degraded lands with low cost conservation technologies. For society empowerment there´ll be a strong integration among teaching, research, extension and field inspection.

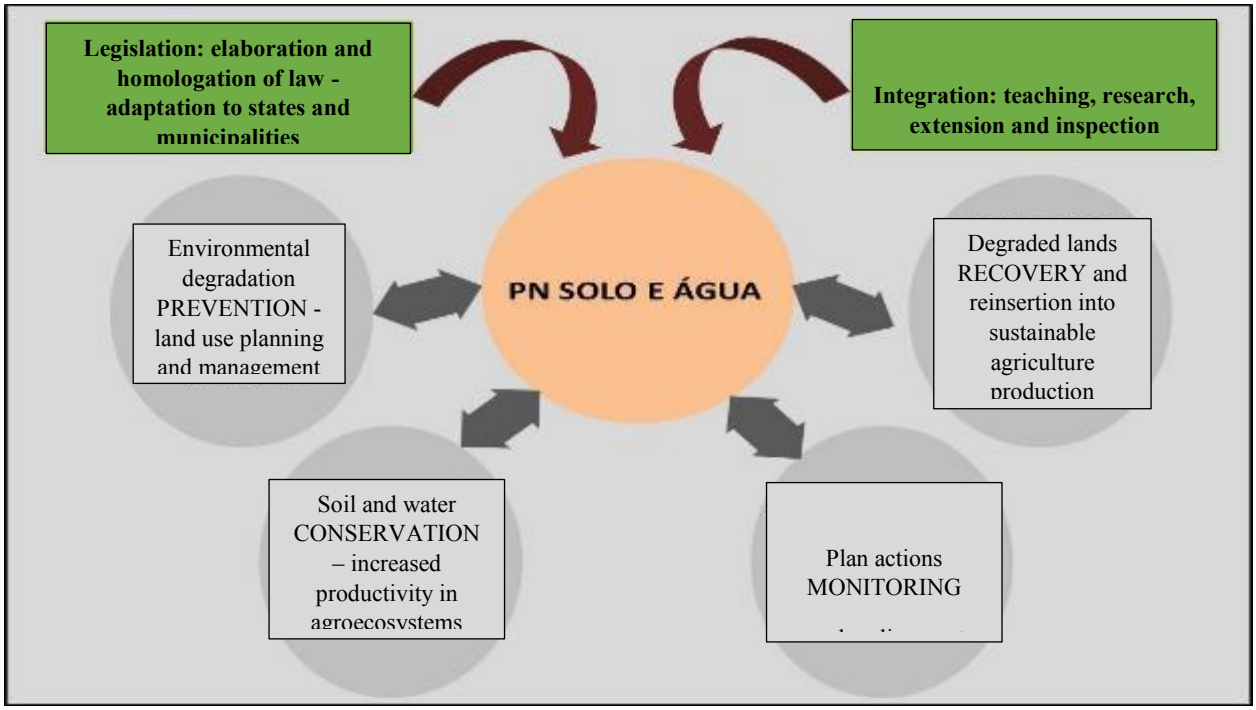

Figure 3: Plan framework.

Results

Preliminary studies indicate that there are other instruments that are intended to be analyzed, such as the National Program of Hydrographic Microbots (PNMH), National Agroecology Plan, National Action Plan to Combat Desertification and Mitigate the Effects of Drought, National Plan of Water Resources, Low Carbon Agriculture Plan, among other pertinent. With the information generated it is intended to contribute to raising awareness in society of the need to expand actions that promote the proper use of soil and water resources and the recovery of degraded lands. To do this, it will seek to propose guidelines and action strategies for the implementation of the Plan in the different Biomes, Hydrographic Basins, States and Municipalities of the Federation.

The result is to create guidelines to guide the management of soil and water in Brazil in terms of its use, management, conservation and recovery in rural areas in a participatory manner. These actions will also promote benefits also in the urban environment, especially in improving the supply of water and agricultural products, in quantity and quality, to the whole society, contributing to the food, water and energy security of the country. In addition, it is intended to contribute to the fulfillment of the goals of most of the Sustainable Development Goals (SDGs) established by the UN.

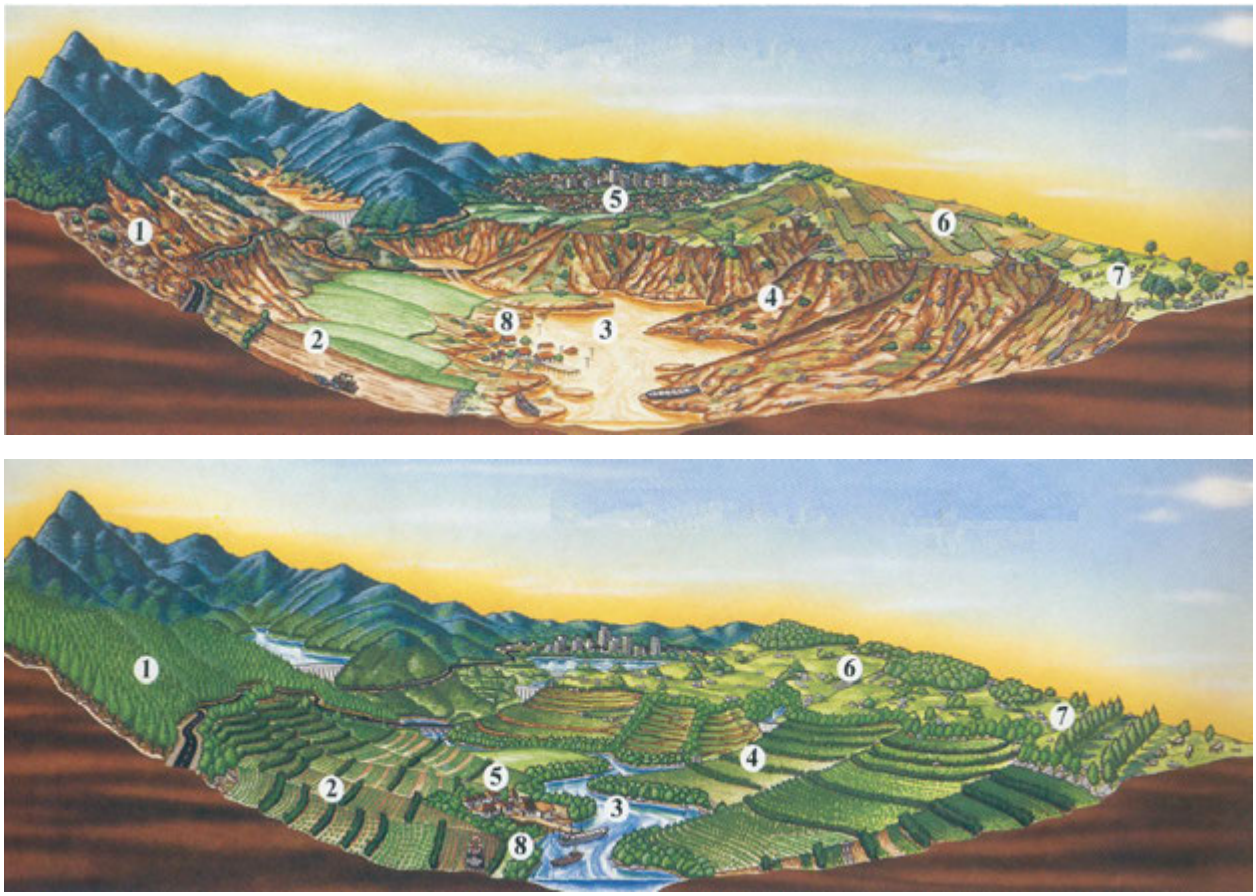

Figure 4: Degraded landscape changing through low cost conservation practices providing water, production and food.

Discussion

To build a Plan of national scope and to contribute effectively to the confrontation of the problems caused by the acceleration of the erosive processes and the consequent degradation of the soil and water resources, a broad mobilization of the society will be necessary. Thus, its structure should be based on levels of strategic, tactical and operational planning. In the strategic, it has been planning several meetings where there will be involved the ministries related and their respective institutes to elaborate the main idea. For the tactical would be mobilized related society committees, strong local cooperatives and associations, and special communication and dissemination institutes to create campaigns according to different biomes. Finally, the operational planning should involve all those related directly to the land use, working with workshops and different publicity sorts (as videos, booklets, posters, cards). Even though it may have a regionalized cut, conferring greater flexibility and adaptation to regional differences according to the six mainly Brazil´s biomes by the continental dimension of Brazil.

For the planned changes to occur, it is necessary for the agents of degradation to become agents of sustainable development. The premise is that the joint and continuous construction is that it is in fact capable of promoting degraded landscapes transformation into productive landscapes of greater environmental quality. In this way, it is suggested that the Plan should be a comprehensive and permanent program, in accordance with the different needs of the country, and should be constructed in a participatory manner so that it gains legitimacy in the different follow-ups of the society and regions of the country.

Conclusions

This project aims to contribute on better life quality for Brazilian citizens, seeking for better agricultural practices to promote more productivity on the field and food security. Besides, to improve ecosystem services provision and management, with a special attention on clean water production, soil quality against desertification and halting biodiversity loss, promoting the restoration of eroded sites. Society empowerment should bring the belonging sense for each stakeholder involved in its biomes context, counting on governmental efforts to promote the Plan in each one.

Prevention, conservation, monitoring and recovery will be part of stakeholders´ empowerment, through integration with other policies and actions. Besides that, low cost technologies and information access will be added to this campaign to aims to make people understand the importance of their actions related to the consequences of land use. , through empowerment decisions and actions to minimize soil erosion.

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