Do we lack territorial intelligence to propose a responsible model of agricultural production for the Orinoco Region?

"Sustainable development is not a goal to which we arrive, but rather a means of travel." *M.* Novo.

It is clear that the Orinoco region has entered the global circuit of agricultural production systems. From the year 2010, there has been an increase in the area planted with monoculture (rice, soybeans, corn, oil palm and forestry with exotic species) in which foreign investors with large sums of capital have "discovered" us as the great frontier that allows them to increase their economic base and avoid the unmanageable intervention in their own country's ecosystems.

At this juncture, those investors in Colombia have taken advantage of the shortage of local and regional institutions that can cope with the crisis associated with sustainability - which continues being a global crisis with serious local impact - such as mentioned by Guimarães (1991). Such an agricultural production model, beyond generating an ecological crisis, is also causing an eco-political crisis, that is, a crisis related with the institutional and power systems governing the ownership of property, the use and distribution of resources in the territories that have been recently colonized.

This addresses, therefore, the urgent need of incorporating a framework of transitional socio-ecological territorial intelligence in the making of political and economic decisions in light of an agricultural production model that is altering the dynamic networks of the former means of production. At the present time, due to institutions that are evidently dysfunctional for ensuring that the agricultural model does not unleash irreducible problems, we, who are of this Orinoco region, feel obligated to set off alarms regarding changes in the environment in proportions never seen before in the Colombian plains.

It has also been denounced that the global economic development based on the waste of natural and human resources has increased in various ways, the vulnerability of natural systems and some social groups that formerly lived in the territories now affected by the agricultural production model are moving to new areas in different continents, such as is taking place in South America.

In the Orinoco region, changes have begun to take place, after we accepted the need to insert ourselves into the global economy and into more dynamic markets. But from now, even though we accept the initial intention as having been good, the warning is that the execution has been terrible.

For example, the agricultural model has begun to seriously alter the landscapes, simplifying them, taking them towards a new structure of agro-ecosystem, with the expression of the potential of the new required technologies, which are set on the expansion of farmland with more intensive use of water resource, to the detriment of the other uses of the territory.

Thus, it is no accident that low-intensity livestock has disappeared as a mobile component of the agro-ecosystem, as an interconnector between the different spaces and competitor in the use of energy. Although the current paradigm indicates that the soils in the Eastern plains of Colombia are suitable only for agribusiness, a recent study by members of the University Javeriano, the University of the Llanos, and another institution, OXFAM, says that, on the contrary, that they are suitable only for agricultural production by family farms (Forero et al, 2015).

From what is written by them, it can be deduced that the model of intensive monocultures impoverishes the assortment of crops produced by rural agriculture, which in turn, reduces self-consumption by the farming communities, which traditionally have grown and taken from their environment all that they have needed in their diets, such as, fish, poultry, and the seasonal supply of native fruits. Human appropriation of net primary production not only is causing a decline in biodiversity, but also a rise in production. Contributing to this increase in production is the massive incorporation of pesticides for agriculture, fertilizers, etc. and the use of water resources in the agricultural ecosystem - the sustained increase in productivity of land and labor, is only possible through a correlative increase of the hidden footprint, that is, by importing energy and materials.

Consequently, the increase in physical production by the agro-ecosystem is doing a similar thing, as it goes "importing more pesticides, fertilizers, etc, for agriculture", it's simplifying the landscape and biodiversity.

The higher productivity of the territory cannot be considered to be efficient, when it is based on the energy inefficiency of the agricultural model, when its only feasible due to energy subsidies, usually made with governmental resources, i.e., with money from taxes of all fellow citizens. Additionally, the model poses an intensive and indiscriminate use of pesticides and genetically modified organisms. Overall, 85% of world production of pesticides is used in agriculture, 10% of the world production is used in health campaigns to control vectors, and another 5% is used in stored products, in the livestock sector, public areas, houses and buildings to control pests, such as, insects and rodents. The chemical substances used in agricultural production cause pollution of water, air and food, generating significant risk to public health, productivity, and ecosystems. Colombia occupies the worrisome fourth place among the nations of the world that uses the most amount of pesticides (insecticides, fungicides and herbicides) (FAO, 2012).

About 20 tons of pesticides are used for each thousand hectares of crops. The herbicides account for about 40% of the volume of pesticides used. Here also, as in the rest of the world, glyphosate (GP) is one of the most applied herbicides by the agricultural production model. In general, it is recognized that when its solubility is greater than 30 ppm, there is a potential risk that the pesticide will reach the underground water. In this region, the use of fertilizers and other agrochemicals in agriculture for their continuous discharge in aquatic systems, could from now be generating a phenomena of eutrophication (i. e., rapid algal growth, changes in the structure of biotic communities, reduced biodiversity, fish mortality, and the depletion of dissolved oxygen).

Moreover, some previous studies (Eslava et al., 2007) have warned that the misuse of pesticides, and genetically modified seeds with introduced resistances, could generate impacts on non-target species, and consequently on the biodiversity of the Orinoco region.

Alarms were set off about the use of this agricultural model in the ecosystems of the Orinoco region, especially concerning the surface and underground water in areas where it is in delicate balance, such as, is the case of rivers originating in the Eastern plains of Colombia, or in the flooded savannas of the state of Casanare. For example, one cannot be calm knowing the scientific and technical data on concentrations of pesticides in the soil and water. That refers only to a small part of the problem that has to do with the use of agro-chemicals. Studies on the impact of the new developments on the populations of wild mammals, birds, fish, shellfish, macro and micro-invertebrates living in the wetlands, streams and rivers of the Orinoco region are also needed. Unfortunately, no official data from systematic environmental monitoring is known to have been carried out in recent years in relation to agro-ecosystems. The Ministries of Health, Agriculture and Environment, in collaboration with the regional health departments, the Regional Autonomous Corporations, and regional ICA offices, respectively, have functions on monitoring and control for storage, transport, distribution and sale of pesticides.

But as noted in various forums and documents, in Colombia despite the existence of authorities to control pesticides from the agronomic, health and environmental standpoints, difficulties arise in regulatory, administrative, and operational terms, which is much more precarious in the Orinoco region. Then, the question arises. Is the intensive and efficient use of the Orinoco region for the production of food and agricultural goods really sustainable? Yes, of course it is. But for its starting point, one needs to change many paradigms of development and productivity, where the energy efficiency model is of prime importance, one that generates autonomy, when biodiversity is an active and decisive expression of productivity, and when crop and livestock integration is a search for transformation of the productive potential of the Orinoco region. Tropical complexity is the fundamental basis for the productivity of the territory, but it demands not only knowledge and ability to interpret, it also demands a society that understands the difference of being privileged to be located on the equator and what it represents. Given the need to provide responses at the level of the territory, where one faces the social and environmental costs of globalization, the concept of territorial intelligence (TI) was developed by groups of European researchers in the mid-80s (Girardot, 2000), which would allow us to propose a prospective reflection on the economic, social, environmental, and cultural challenges of globalization in the environment of the Orinoco region.

TI can produce knowledge about territorial dynamics, especially about the needs of the people and the available resources, and does so through the design and implementation of tools for monitoring and strategically evaluating set by the territorial actors directly involved in the management of tensions linked to the sustainable territorial development.

Individuals with territorial intelligence conduct their multidisciplinary research in view of the combination of economic, social, environmental and cultural development objectives in the context of a socio-ecological transition. For this reason, we urged the research groups of the Orinoco region of Colombia to reflect on the problems of the agricultural model that is presently being used, and to formulate, and answer relevant questions, and above all, to generate alternative ways of TI whose results do not follow the same path in terms of the concentration of economic power, to pass from economic dependency to exclusion, the denationalization of economies, building of market societies, and in that way, resulting in heteronomous individuals who are unable to calculate and reclaim civilly about the problems arising from the ecological and social debt that is resulting from the present agricultural model that is being imposed on them.

In line with this, future issues of this publication, Revista Orinoquia, will include a section from the Doctorate in Agricultural Sciences program, properly submitted to the arbitration of scientific peers, to share knowledge, and discuss the problem of the agricultural systems used in the Orinoco region of Colombia.

Thanking you in advance for any feedback received on our website:

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