THE CONCEPT OF SUSTAINABLE SCALE BY ECOLOGICAL ECONOMIC AND CONTRIBUTION OF SOIL SCIENCE

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Currently there is a creative social dynamic resulting in the appearing of interesting efforts of global, regional and local level and they are directly or indirectly benefited from the adoption of a more integrated view of natural resources valuation processes which search for sustainability. However, these efforts in discussions on the operationalization of the sustainability concept, has required more explicit and constant appropriate reasoning for evaluation processes, which involves, firstly, sketching the pre-analytic vision that involves.

The Ecological Economics is considered a science system, that is, which cares about the understanding of complete systems, not only with their parts. A system means a set of interdependent parts connected by energy exchanges of matter and information (COSTANZA et al., 1997). Recognizing the fundamental relationship between systems as the object of ecological economics involves review and adopts a series of principles, fundamentals and parameters of economic theory. Daly (1997) postulated such parameters through the concepts of scale, allocation and distribution. The integration of various approaches proposed by different knowledge areas, points out to consider the problems associated with sustainability. In this emerging interpretive approach, which considers simultaneously the objectives of ecological sustainability, distributive justice and economic efficiency are goals postulated by ecological economics (Costanza, 2001).

This vision must sinthesize the fundamentals which justify the theoretical tools, and in the case of Ecological Economics, the first component of this pre-analytical vision is the sustainable scale definition.

In broader terms, it may be stated as scale, the physical volume of natural resources use over time, i.e., the scale sustainable refers to an activity level that allows conservation of ecosystem capacity to regenerate raw materials and absorb the residues over time. In ecological terms, it means maintaining the support or load capacity of ecosystems.

The land use capacity can be understood as an instrument that can allow scale quantification with respect to the use and land occupation for agricultural, pastoral and forestry purposes.

Thus, it was be verified if the lands of Araras city are within their use or "support" capacity and what is the need to do readjustments in their use. This may contribute to maintain the environmental services offered within an acceptable range.

Lepsch (1991) comments that the appropriate land use, according to its use capacity is the first step toward correct agriculture. For this, each land parcel must be used in accordance with its support capacity and economic productivity, so that resources are available to the man to their best use and benefit, worrying, at the same time, preserving these resources for *future generations.* Implicitly, the author puts in discussion the issue of timelessness advocated by ecological economics, i.e., the system must be sustainable so that future generations can enjoy the goods and environmental services.

This work aims to define the land use capacity in Araras city, São Paulo, Brazil, and verifying if agricultural exploitation is within a *sustainable* range, providing conditions for environmental goods and services offered can be enjoyed by *current and future generations.*

Methodologically despite the existence of different systems to define the capacity of land use in Brazil, the most adopted are: evaluation system of soil suitability for agricultural use (Ramalho-SON and BEEK, 1995) and land use capacity system (Lepsch et al., 1991). For this work, we chose to adopt the use capacity not only because the detail level of the basic information (soil, topography, use, climate), but also by the intention of a broader conservation level approach.

Use capacity system is a technical and interpretive classification, representing a quantitative group of soil classes regardless of location or economic characteristics of the land. Several characteristics and properties are synthesized in order to obtain homogeneous land classes, with the aim of defining its maximum use capacity without risk of soil degradation, especially with respect to accelerated erosion (Lepsch et al., 1991).

Figure 1 shows the eight use capacity classes, conventionally designated by Roman numerals, where the use intensity is decreasing in I-VIII direction.

Class VIII FF: legal restriction and Class VIII ff: very fragile areas, with strong agro-environmental restrictions, although they are not part of the system and were considered to be an innovation developed by Pereira(2002).

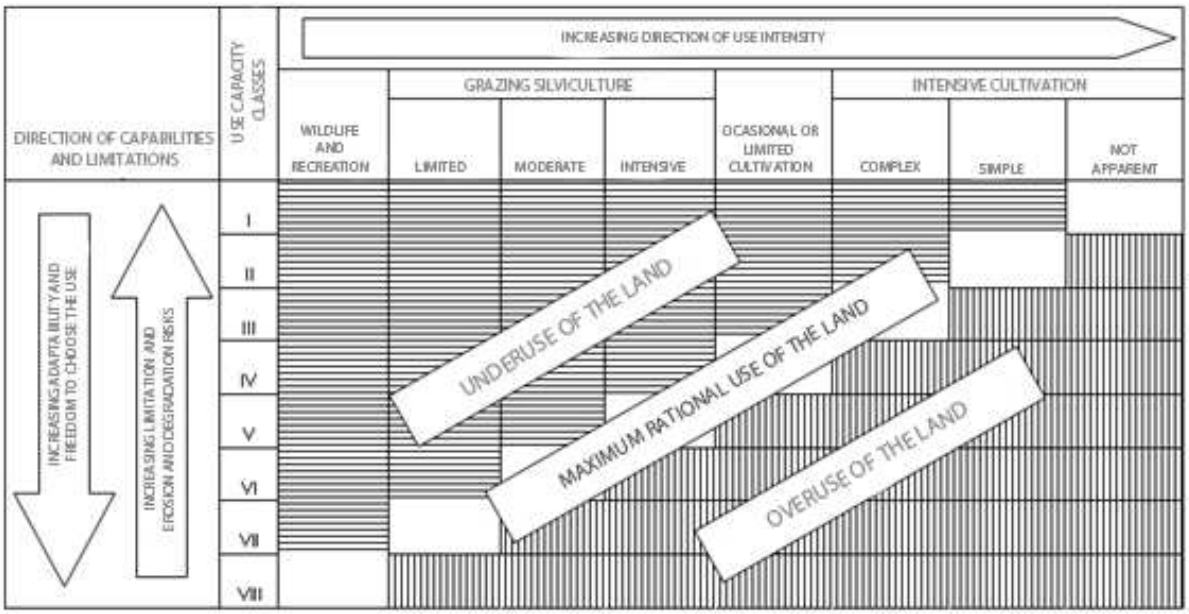

Figure 1 –Land use capacity classes.

Source: Lepsch, 1991.

Table 1 shows the classification results of the land use capacity of Araras city in terms of hectares and percentage.

Table 1- Land use capacity classes of Araras city, SP and respective areas

USE CAPACITY CLASSES	AREA (ha)	%
I	24.726,13	38,43
II	25.172,55	39,12
II	3.874,07	6,02
IV	2.270,25	3,53
VI	921,53	1,43
VII	403,73	0,63
VIII	38,50	0,06
VIIIFF	2.379,10	3,70
VIIIff	682,16	1,06
Urban areas	3.425,15	5,32
Water bodies	448,45	0,70
TOTAL	**64.341,60**	**100,00**

Source: Data generated by research.

Table 2 shows the conflicts areas which occur in the city, i.e., the ratio of areas that are under and overused. In order to achieve a sustainable level of land exploitation in the city, it is necessary to readjust land use, especially in overused areas, or require to be used for activities of less intensive use. This area represents approximately 3.55% of the total area of the city.

Table 6 – Conflict areas in Araras city, 2007.

CONFLICT AREAS	AREA (ha)	**%**
Adequate	46.042,7	71,56
Overused	2.282,7	3,55
Underused	12.142,6	18,87
Urban area	3.425,2	5,32
Water bodies	448,5	0,70
TOTAL	**64.341,6**	**100,00**

Source: Data generated by research.

In conclusion, it is verified that the methodology to define the land use capacity in Araras city is a very useful tool for defining sustainable scale in agricultural areas, advocated by Ecological Economics, allowing making the following statements:

a) Araras city has highlighted potential for agricultural use, due to large land areas suitable for farming, mainly characterized by the excellent soil, topography and climate conditions;

b) About 71.6% of land use is suitable which means that it is within its range of sustainable.

c) There were also areas with inadequate use in both situations under and overused, that must be readjusted within their support capacity in order to avoid environmental degradation and at the same time maintaining the ecosystem services offered, thus restoring the agroenvironmental sustainability of the city;

d) Capacity evaluation of land use is a powerful tool usable not only in agroenvironmental planning, but also for the evaluation and definition of agricultural production sustainable scale;

e) In front of the great deficiency of vegetal cover in the city, it is suggested not only the recomposition/ recovery of riparian areas (PPA), but also the allocation of underused areas for the composition of the Legal Reserve, aiming at the same time the reduction or elimination of environmental liabilities and Brazilian Forest Code compliance;

f) It can be considered that the pre-analytical vision of Ecological Economics, in relation to the issue of sustainable scale for agricultural exploitation can be evaluated using the methodology of land use capacity, which was approached in this paper.

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