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Sustainable agriculture

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Abstract
Based on the foregoing it can be concluded that the management of space on the premises of sustainability (in this case the development of sustainable agriculture) first possible where all the following (environmental, economic and social) conditions. Research opportunities for development of sustainable agriculture must be based on geo system approach that includes consideration of reversible relations of agricultural activity and geographical area (regions) in which it operates. Agronomy was first defined as the science of crop production. It was mainly focussed on the study of relationships between climate, soil, cultural practices, and crop yield and quality. Agronomy integrates therefore sciences such as biology, chemistry, soil science, ecology, and genetics. Agronomists then enlarged their studies to the individuals performing the cultural practices, namely farmers. This approach raised new issues on the modelling of farmer's practices, and on the consequences of farmer's choices on crop production.

Keywords: Agriculture, Organic farming, Plant Nutrients

Introduction

Agriculture

Agriculture is the economic activity, including plant and animal production, and therefore can basically say that the two main branches of agricultural and livestock farming, which together with forestry and fishing belong to the so called primary economic sector. Agricultural production is the process of production plant and animal products, fish farming, bees and other forms of cultivation and production taking place on agricultural land (Kusters, 1996) [4]. Under agricultural land means land used agricultural production (land, gardens, orchards, vineyards, pastures, meadows, marshes, ponds and swamps) and the corresponding land planning document is intended for agricultural production. Sustainable development has become a fundamental principle of development policy in a growing number of sectors and organizations from local to state level, the private sector through the shareholder (the practice) to the state organization of the economy. There is much discussion about the development of indicators to determine policy development and evaluation of the level of progress. More in our communities, the term includes the development of economic progress, which is not complete or accurate. Economic progress is just a part of development. The concept of sustainable rural development based on efficient use of resources, leading to increasing social cohesion in rural areas. This concept has a special role as traditionally the most common farming activity of rural population, but at the same time as the most important factor in rural economy. Insisting on sustainable agriculture is based on commitment to the agricultural population made using existence needs using chemical and technical instruments that have a minimal impact on the environment, to the Agricultural Land Relations homey, which will acquire the strengthening of economic conditions, raising the socio-cultural level in terms of preserved environment (Parausic *et al*., 2008) [9].

Organic farming

Organic farming is a growing subject in European agriculture. As the concern for food quality and agro-ecology deepens, the philosophy and practice of organic farming have taken on new and greater importance in European agriculture. Scofield (1986) [9] stresses that organic farming does not simply refer to the use of living materials, but emphasizes the concept of "wholeness", implying the "systematic connation or co-ordination of parts in one whole". A definition of organic farming provided by Lampkin (1994) [5] states that the aim is "to create integrated, humane, environmentally and economically sustainable production systems, which maximize reliance on farm-derived renewable resources and the management of ecological and biological processes and interactions, so as to provide acceptable levels of crop, livestock and human nutrition, protection from pests and disease, and an appropriate return to the human and other resources". MacCormack (1995) [7] notes unlike "sustainable" farming practices, organic farming practices are well-defined - in fact, organic farming practices are unique, for they are the only ones codified as law. Despite the variety of definitions of organic farming, the general agreements regarding what is necessary to produce organically are in stark contrast to the debates and arguments that rage regarding the nature of agricultural sustainability. However, as Ikerd (1993) [3] notes, "mention sustainable agriculture and many people will think you are talking about organic farming. Some organic farmers will agree.

Sustainable agriculture - an ecological basis for sustainable rural development

Based on the foregoing it can be concluded that the management of space on the premises of sustainability (in this case the development of sustainable agriculture) first possible where all the following (environmental, economic and social) conditions. Research opportunities for development of sustainable agriculture must be based on geo system approach that includes consideration of reversible relations of agricultural activity and geographical area (regions) in which it operates. Research Methodology environmental components of sustainable development implies, first check the current agro ecological zoning of the territory, since it is the result of long periods of practice, and the agricultural population is characterized by a resistance to innovation. In this regard, it is important to study the impact that the current way of farming left in the environment. The main one is exposed to agricultural land, which because of inadequate operation gets degraded. At first it can appear depressions spots (phytogenic result of erosion), and it later changed because of physical (mechanical) and chemical characteristics of being exposed to erosion (denudation). It is therefore necessary to study the intensity of soil erosion as a function of processing method, and the properties of the terrain (slope, soil characteristics, precipitation, temperature, water regime of the territory, population density, etc.).

The agroecological strategy

The principle of the agroecological strategy is to build innovative technical scenarios relying on biological regulations in an integrated crop production scheme. This strategy involves applying ecological concepts and principles to the design, development and management of sustainable agricultural systems. Promoting biodiversity in agro systems provides ecological services such as nutrient cycling, soil structuration and disease control. Biodiversity can be enhanced by cultural practices such as intercropping, rotation, agroforestry, composting and green manuring. Recent studies address also new issues in integrated pest management by combining the use of biological, physical, cultural and genetic control measures (Gurr *et al*., 2004) [2]. Increasing biodiversity by crop rotations (combination in time), intercropping (combination in space) and varietal mixtures was pointed out as an alternative to chemicals (Vandermeer *et al*, 1998) [11]. At this level, agronomy should interact with landscape ecology, because spatial variations in the landscape may be used for pest management. The productivity of farming systems should be increased by developing ecological principles and adapting them to farming systems. The agroecological strategy thus requires to enlarge the experimental scale. Experimental scenarios should not be designed at plot level, but at the scale of larger territories. Therefore, investigations need a much better understanding of interactions of living organisms at plot and larger levels. They also require input from other disciplines such as ecology and geography.

Agronomical research for sustainable agriculture

Agronomy was first defined as the science of crop production. It was mainly focussed on the study of relationships between climate, soil, cultural practices, and crop yield and quality. Agronomy integrates therefore sciences such as biology, chemistry, soil science, ecology, and genetics. Agronomists then enlarged their studies to the individuals performing the cultural practices, namely farmers. This approach raised new issues on the modelling of farmer's practices, and on the consequences of farmer's choices on crop production. Agronomists further analysed environmental impacts of farmer's practices. More recently they studied also how agriculture could benefit from environment and ecosystems to improve crop production, thus leading to the concept of "ecological services". To study crop production, agronomists have to integrate highly complex sciences that rule farming systems at very different spatial and temporal scales. Agronomists have also to cope with a high environmental variability. As a consequence, results obtained in an experimental field may not be reproducible in another field due to slight - possibly unknown - variations of soil and climate factors. Therefore a key point of agronomical investigations is to define the validity domain of each finding. Concerning the integration of agricultural practices, a key point is to enlarge the classical scales of crop production studies, "plant and plot", to scales that are meaningful for the farmers, such as combination of plots and farm territory, and even larger scales. In a way, agronomy is a science of complexity aimed at integrating knowledge at various spatial levels from the molecule to the living organism, the farming system and the global scale. Thus agronomy appears more and more as the science relevant for global issues because it integrates knowledge from various sciences at various spatial scales. Considered for a long time as a soft, side science, Agronomy is rising fast as a central science because actual issues are about food, and humans eat food. The systemic dimension is essential because in the next decades most improvements of farming systems will rely on enhancing positive interactions among various parts of farming systems. To build sustainable farming systems, agronomists will not only have to assess the direct effects of techniques on a crop, but also the indirect effects on the whole ecosystem such as biodiversity changes, water pollution, and soil erosion. The economical and social consequences of the new farming systems should also be evaluated with a pluridisciplinary approach with economists or social scientists. Therefore sustainable agriculture fosters the development of multidisciplinary studies that associate agronomy with ecology, economics, sociology and geography (Lichtfouse *et al*, 2004). Meynard *et al* (2006) [8] identified four different ways to design of innovative agricultural systems for sustainable Development.

Organic Sources of Plant Nutrients

At present, most optimistic estimates show that about 25–30 percent of nutrient needs of Indian agriculture can be met by various organic sources. Supplementation of entire Nthrough FYM sustains crop productivity at more than use of conventional N fertilizers. Since the estimates of NPK availability from organic sources are based on total nutrient content, efficiency of these sources to meet the nutrient requirement of crops is not as assured as mineral fertilizers, but the joint use of chemical fertilizers along with various organic sources is capable of sustaining higher crop productivity, improving soil quality, and productivity on long-term basis. These organic sources besides supplying N, P, and K also make unavailable sources of elemental nitrogen, bound phosphates, micronutrients, and decomposed plant residues

into an available form to facilitate the plants to absorb the nutrients (Chhonkar, 2002) [1]. Application of organic sources encouraged the growth and activity of mycorrhizae and other beneficial organisms in the soil and is also helpful in alleviating the increasing incidence or deficiency of secondary and micronutrients and is capable of sustaining high crop productivity and soil health. The farmers can in turn, get good remuneration from organically produced crops and if included in high value crop rotations, that is, aromatic rice (Oryza sativa L.), table pea (Pisum sativum L.), and onion (Allium cepa L.) due to their heavy demands in domestic, national, and international markets (Chhonkar, 2002) [1].

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