

Sustainable Agriculture: Extensive Systems and Extensification

Dr. Claude Beranger

Director of Research National Institute of Agronomic Research (INRA), Paris, France

Introduction

During the last eight years, the common agricultural policy reform in the European Community (EU) has centered on extensification of agricultural production, which has been subject to considerable debate, studies and policy measures. Extensification can be defined as the process (or trend) of developing a more extensive production system, i.e., one which utilizes large areas of land, but with minimal inputs and expenditures of capital and labor. Intensification, on the other hand, seeks to increase the productivity on a given (or fixed) area of land by progressively increasing the inputs, including capital and labor.

Such policy issues have also raised concerns about the preservation and improvement of the ecological environment, and have created some rather vague concepts of sustainable development and sustainable agriculture. These concepts have heightened public interest, but have generated numerous questions. The working groups and “think tanks” that have attempted to deal with these issues in France can enlighten us on the points of convergence between extensive production systems and sustainable agriculture. But the question still remains whether extensification and the development of more extensive production systems can actually contribute to the goals and objectives of sustainable agriculture.

Development of Agriculture Policy

Limiting Production

The subject of extensification first appeared in agricultural policy documents about 1988, and was considered as a strategy for dealing with production volume and, in effect, reducing export costs. In fact, the policy of quotas as applied to dairy farms certainly limited milk production; but it did not address the dominance of intensive production systems which have the ability to quickly shift to other alternatives. Consequently, the quota system soon led to other types of surplus production such as beef and cereal grains. Thus, it seems that one way of reducing the excess production of a given commodity, while maintaining efficiency, would be to lower the production inputs.

Occupying Land

In France, as in other countries, extensification in animal production was of particular interest to public administrators because it was seen as a way of occupying excess land that became available as the number of farmers declined. The uncertain economic climate surrounding agriculture, and the concern for expanding the area of less productive land, raised questions about the likelihood of soil erosion and whether some agricultural zones should be abandoned. The concern for occupying excess rural lands and the potential for over-production has had a significant impact on agricultural policies for regulating livestock production in Europe, and particularly France. For example, the following measures are now in effect:

- enlargement premiums for herds producing meat, and
- grassland premiums (inaugurated in France) to support extensive systems having one animal unit or less per hectare on the main forage area.

Initial results indicate that such inducements help to promote extensification and to maintain extensive systems.

Protection of the Ecological Environment

There have been increasing concerns by society as a whole of the impact of agricultural practices on the ecological or natural environment. These concerns have been accounted for in the development of agricultural policy and include measures for:

- reducing farmyard and off-farm pollution,
- preserving and protecting water quality,
- controlling soil erosion and fires,

- preserving and/or restoring ecosystems and landscapes, and
- preserving the natural resource base.

In Europe, we have developed agro-environmental measures to help compensate the losses suffered by farmers who cease exploitive and undesirable practices in sensitive areas, and to provide remuneration for their environmental services, e.g., conservation of desirable flora, revegetation of denuded areas, etc. However, to ensure accountability, it is highly desirable that such environmentally-sound practices be included in the farmer's production system. In this way, the environmental aspects are integrated into the economic objectives of the farmer's management plan.

Extensive Farming Systems and the Ecological Environment

Extensive farming or production systems can be more beneficial for the ecological environment than intensive systems. They require fewer chemical inputs (i.e., chemical fertilizers and pesticides) and, thereby, minimize the risks of land and water pollution. They also utilize more surface area for most types of production and, thus, avoid the fallowing or abandoning of land, intensive tillage, and land degradation by soil erosion.

However, extensification alone does not systematically lead to environmental improvement or preservation. For example, year-round outdoor herd management can reduce investment in expensive indoor facilities, but may lead to animal manure problems that are even more difficult to manage than in barn-rearing. Efforts to control soil erosion and prevent the pollution of surface water and groundwater often implies a need for restructuring of land parcels. Thus, the search for economies of inputs may lead to the selection of cheap but extremely polluting products. By contrast, integrated crop or livestock systems can ensure high levels of production per hectare from the judicious use of agricultural inputs ; thereby, protecting the environment and remaining intensive by utilizing the available land surface area.

These examples strongly suggest that environmental objectives must be combined with other production goals and objectives that are relevant to the occupancy of land in extensive systems. We must continue to seek the optimization of economically-viable and resource-efficient production systems, ensuring the proper use of land with a minimum of inputs, while protecting and improving the ecological environment.

Sustainable Development and Sustainable Agriculture

The integration of environmental sustainability into the production system is linked to the notion of sustainable development, and sustainable agriculture as well. The advocates of environmental protection and preservation have gradually admitted the legitimacy of economic and social development to which they were frequently opposed. The preservation of our natural resource base and the balance of ecosystems are vital prerequisites for ensuring a sustainable development for a sustainable agriculture. Conceptually, it focuses on utilizing natural resources to sustain the actual needs of society today, without compromising the ability of future generations to sustain their needs. The notion of sustainability has now become a social ethic which promotes the "harmonious" local, regional and global conservation of natural resources by linking land use, natural ecosystems and human activities.

Agriculture worldwide has seen a number of movements that advocate the need for a more sustainable development in view of our finite resource base. For example, most versions of organic farming seek to preserve or maintain the natural resource base by nurturing the soil, enhancing biodiversity, balancing the ecosystem, and producing crops, all without the use of synthetic chemicals. Similarly, integrated farming systems combine chemical and biological methods while seeking to maximize production, reducing external inputs, utilizing natural resources and regulating the system using biological cycles. Economic and autonomous agriculture, as proposed by INRA in 1978 for developing extensive production systems through extensification, also fall into this category by integrating the reduction of inputs, natural regulatory processes, and conservation of natural resources

Today, there is increasing concern for the actual location or region involving a particular farming

system. This helps to account for environmental problems which are larger than the individual holdings (e.g., valley, fragile environment, catchment area, etc.), and those problems associated with local activities and rural life. Over the last two years, experimental sustainable development plans have evolved in France which have essentially integrated the current farm development plan with economic, ecological and social functions related to farming. This multi-functional focus seeks to simultaneously and harmoniously consider these three functions for relevant situations with respect to local and regional conditions.

Lessons of Extensive System and Extensification

Extensive systems and extensification are now becoming the essential constituents of sustainable agriculture, and less important as a means of limiting excess production and occupying land. Nevertheless, it is the land factor that is primarily involved in extensification and not labor or capital. Generally, less is produced per hectare in extensive systems than the production potential allowed by more intensive systems. Using natural biological processes and cycles for controlling pests (in lieu of pesticides), and fewer external inputs such as chemical fertilizers, may result in lower production but one that is more profitable because of higher net returns. Thus, extensive systems contribute to preservation of the ecological environment by reducing the inputs of chemical fertilizers and pesticides, improving soil and water conservation, promoting better stewardship of the land itself, and enhancing the appreciation of land values.

In extensive systems, rather than seeking homogeneity at all costs, the diversity of land and animals is managed by combining them in the best possible manner. In this approach, inputs are used as tools for managing the system, and not merely as production factors. This requires a higher level of skilled management, based on observation, experience and knowledge, than in more intensive production systems. Contrary to popular belief, this method of management provides more flexibility and safety than intensive systems, and further contributes to its profitability.

Conclusions

Within the framework of sustainable development, extensive production systems and extensification can provide powerful leverage in adapting a more sustainable agriculture. In this regard, it is essential that we expand our knowledge and improve our management skills through research, training and development, rather than implement intensive models to be tested and validated with high levels of inputs, investment and technology.

In regard to economic and political considerations, there needs to be suitable premiums and compensation for farmers who are making significant contributions to environmental protection and restoration, soil conservation, and improved land practices. The remuneration of positive externalities, i.e., those goods and services the costs and benefits of which are not properly accounted for by the pricing system, is indispensable for proper operation of the economy. It is also important to support new management initiatives that protect the environment, maintain a coherent and efficient production system, and ensure the farmer's decision-making role. Agriculture should evolve toward a more contractualized and multi-functional system. Solidarity at the different levels of organization and the transmission of financial and human capital, combined with transformation of the production systems and society, will likely prevail.