Agro-ecology, sustainable agro-food systems, new relationships between the countryside and the city

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1. A brief history of agroecology

The term agroecology was used for the first time in 1928 by Bensin, a Russian agronomist. He used this term to indicate the application of ecology to agriculture. In the same period others authors published papers or books dealing with agroecology, but without mentioning the word. Examples are Klages (1928), a US agronomist interested in the distribution of crop plants using a physiological basis, and Azzi, an Italian scientist who published in 1928 a book on “Agricultural ecology”, laying down the foundation of his later work (Azzi 1942; 1956). The latter in particular, concentrated on environmental aspects, such as climate and soil, in relation to agricultural plants development and growth. Both these two scientists, while not using the term agroecology, may be considered the pioneers of the discipline.

Between the 1930s and 1960s, different other works were published in which the term agroecology was explicitly used or which applied the meanings of agroecology leading in that period (Bensin 1930; Tischler 1965). From the 1970s, also as a response to the Green Revolution and to the consequent intensification and specialization of agriculture, there was an increasing interest for ecology applied to agriculture. It was in this period that the concept of agroecosystems, as domesticated ecosystems, emerged (Odum 1969) and that critics to agricultural technology began (Ehlich 1966; Meadows et al. 1972).

From the 1980s, Altieri (1989) first and Gliessman (1997) later, started to define agroecology as an approach to protect natural resources and to design and manage sustainable agroecosystems. Gradually agroecology started contributing to the concept of sustainability applied to agriculture (Thomas, Kevan 1993). In this period the biodiversity theme emerged (e.g. Altieri 1999) and the words soil and landscape started to be used (e.g. Steiner, Osterman 1988) in the framework of agroecology related publications.

In the course of the twentieth century, as the meaning of agroecology as a scientific discipline evolved, its identity changed as well. According to Wezel et al. (2009), starting from the 1990s, it also became a movement and a practice. Indeed, in this period, the term agroecology started to be used to define a new way to consider agriculture and its relationships with society, i.e. a movement. At the same time agroecology was recognized as a set of practices aimed at developing a more environmental-friendly and sustainable agriculture, as an alternative to high input, chemical intensive agriculture.
Moreover, as agroecological research approaches emerged, several scientific works were published and education programs put into motion, in USA, but in Europe too (FRANCS ET AL. 2011). In particular agroecology became more and more interdisciplinary, as confirmed also by some authors (e.g. DALgaard ET AL. 2003; BUTTEL 2007). Indeed, over time, more disciplines were involved besides agronomy and ecology, such as zoology, botany, plant physiology, and last but not least geography and socio-economics.

2. Agroecology today: a new approach to the land

Today agroecology embodies a new multidisciplinary, inter-sectoral and multi-scalar approach to territorial studies and a rigorous strategy to establish a new country-town relationship. Indeed, on one hand it provides a more current vision of agriculture and farming systems that influences the development of management, monitoring and planning tools. On the other hand it offers a different key for rethinking the relation between agricultural issues and society.

With reference to the first aspect, the more strictly scientific, agroecology today has as its primary objective the sustainable management of all resources involved in the process of agricultural production and the protection of the landscape (BOcCHI ET AL. 2012). It therefore discloses, for example, the importance of agro-ecological networks and many cities are planning new arrangements to strengthen these structures. Another major concern of agroecology today is agro-biodiversity, considered as a primary agroecosystems component and a source of ecosystem services (MEA 2005). On the basis of different studies that have demonstrated the effects of agricultural intensification on farmland birds (DONALD ET AL. 2006), on plant species within agro-ecosystems (KLEIN ET AL. 2009; UEMATSU ET AL. 2010), on farm ecosystem quality measured as abundance of species (REIDSMA ET AL. 2006), European policies have implemented agro-environmental measures and interventions. One example is the identification of High Nature Value Farmland (EEA 2004, DOKA ET AL. 2012, HALADA ET AL. 2011), within which the agricultural practices and the care of the agricultural landscape is likely to have a positive impact on agro-biodiversity and biodiversity in general (MOONEN, BARBERI 2008). Similar measures and policies need to be further developed.

Agroecology, however, also implies new perspectives in the relationship between agriculture and society. In the last decades the food system has become the new focus of agroecology research that from the plot and field scales has gradually moved its spatial scale of application to the farm and agroecosystem scales, up towards the whole food system scale. Already in 1980 Altieri pointed agroecology as a discipline useful to alleviate natural resources degradation and malnourishment, and to enhance local food systems functions. In 2003 FRANCS ET AL. define agroecology as ‘an integrative study of the ecology of the entire food systems, encompassing ecological, economic and social dimensions’. In 2007 Gliessman provides a definition of agroecology as ‘the science of applying ecological concepts and principles to the design and management of sustainable food systems’. In this context agroecology offers the conceptual foundations for the new notions of foodshed and alternative food networks (PAUL, MCKENZIE 2013; RENTING ET AL. 2003), both having as a goal the ecological sustainability of food systems and the achievement of a new balance between available natural resources, society demands, agricultural production.
The growing body of research on foodshed, defined as the geographic areas that feed population centers (PeTers eT Al. 2010; StAGl 2002) or potentially meet the demand for food and services of a resident population (Swaney eT Al. 2011), can provide insights into social, economic and environmental issues such as the promotion of policies for security and food sovereignty (Bocchi eT Al. 2012), fossil energy depletion and climate change. Moreover, even though the original meaning of foodshed refers to the food system in general, the term often connotes a connection to local food and market systems (Edwards-Jones eT Al. 2008). In fact, starting from the local resources and characters of the territory, the aim is to formulate and manage complex bioregional systems that not only reduce the negative impacts of agriculture on the society, the economy, the environment, but that can also benefit from new possible couplings between production, settlements, food, infrastructural and recreational systems, with mutual interests. Take for example the possible use of waste in school canteens by farmers who provide food to them. It is on such possible couplings that the great debate on the so-called food-sensitive cities is developing, involving the implementation of projects or programs depicting relationships, even spatial relationships, including production, transportation, consumption and recycling/recovery and that draw our attention to the need to train new professionals (es. food city manager). In conclusion, the new food supply systems, whether alternative or local, are supported by the request on one side of good quality food, and on the other from that of a shorter distance, which is not only spatial, between producers and consumers. In this context, agroecology can and must support spatial planning in the management of green spaces within and outside the city, making it possible agriculture to live together with settlements. By means of proposals for a more sustainable management of resources involved in the agricultural production processes and by exploiting the potentialities of the area, agroecology can thus provide the scientific answer to an emerging and increasingly widespread demand for environmental and food quality; for the recovery of local traditions and knowledge; for the reduction of inefficiencies, wastes, distances between towns and peri-urban agricultural areas.

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Today agroecology is recognized as a new scientific paradigm useful to respond to the new sustainability challenges of both the agriculture and the agro-food system domains. Aims and contents of this discipline have changed over time and are still evolving today: conceptual tools and methodologies offered by agroecology may be usefully adopted within interdisciplinary studies related to sustainable production, consumption, exchange, settlement systems.

In this paper we briefly review the history of agroecology and stress the role it plays nowadays in managing food systems and in particular short-distance food networks, intended as a new way the relationships between the countryside and the city performs.

**Keywords**

Agroecology, discipline, history, local food systems, foodshed, city-countryside.

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