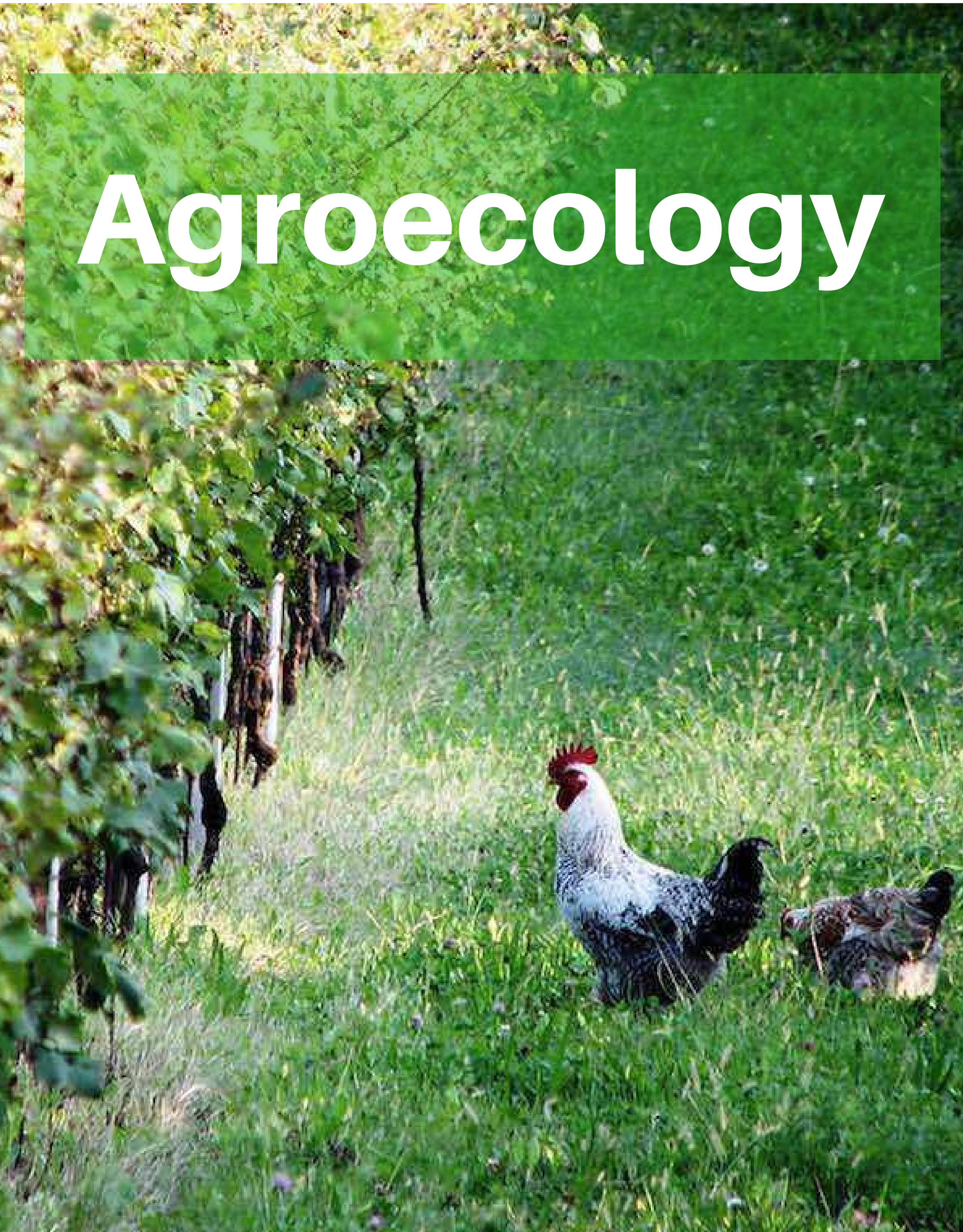
Agrifutures

Agroecology



Many ecologists think that the biodiversity of an ecosystem plays a key role in stability. For example, if there were just one plant species with a particular role in an ecosystem, a disturbance that harms that one species (say, a drought for a drought-sensitive species) might have a severe impact on the ecosystem as a whole. In contrast, if there were several plant species with similar functional roles, there would be a better chance of one of them being drought-tolerant and helping the ecosystem as a whole survive the drought period.

This understanding can then be applied to developing functional complexity with an organic farm to better replicate that found within natural ecosystems and by so doing becoming more stable, resilient, and less dependent upon resources and producing a diverse and sustainable yield to form the basis of economic production.

The background idea behind creating a sustainable organic farming system is to create diverse and interconnected systems that function closer to the complexity of natural systems and therefore require less resources to be maintained. Through understanding how a functional system operates you can better design a permaculture farm system and be aware of the importance of different elements in that system to maintain the functional complexity of the whole.

Designing an Agricultural Ecosystem

As the designers, we are finding as many connections between these elements as possible, creating complex systems that become more stable through being linked to so much. If one thing fails, many are there to step in. Simpler systems, such as a monoculture field, are much less steady. When we look closely at natural systems, we find that the amount of connections between elements and the number of elements interacting is uncountable. Organic farming systems, being living systems, behave the same way.

Nature is diverse, even its harshest conditions, so our systems, too, are designed to be so. With diversity, individual elements have multiple functions that help to maintain stable systems. We design such that our systems have purposeful diverseness, a network of positive connections between the elements there.

Each component supplies the needs of one another and processes the abundance in a uniquely beneficial way. Information is critical for putting together such systems, so we are always observing, recording, reading, reproducing and expanding on multi-functional designs.

Biological Systems

Biological systems are organised as complex food webs based upon the ability of producers to photosynthesize and make sugars that can be added to other nutrients absorbed to make complex carbohydrates, proteins and fats. These that act as a food source for consumers by browsing of herbivores and in turn their consumption by predators.

In this way the energy first captured by the producers is transferred between many animals before being lost from that system and the nutrients returned Producers are living things that are able to make their own food through photosynthesis. They sit at the base of food chains because the energy captured within the biological molecules of their tissues become a food source for other animals (consumers).

They are mostly represented in terrestrial systems by plants and within aquatic systems by algae. In defence of the browsing by herbivores and other consumers, they have adapted a variety of defence strategies including poisons and thorns to deter browsing. At the same time they benefit from animals through pollination and dispersal of seeds.

Within this system there are a recognisable set of interactions between the living systems with energy fixed by the producers flowing through the rest of the ecosystem as the consumers eat them and are in turn consumed by other organisms.

Farm Design

Over the last few decades all farmers have become more aware of the need to become more sustainable on the farm. This has led to greater efficiency, through better use of chemicals and other management tools. In so doing, many have taken the first step toward organic farming. This can be called the efficiency step. The next step is substitution. The basics are a commitment to not relying on pesticides, chemical fertilisers or drugs for the animals. Underlying the whole procedure is the aim of getting the soil active and balanced and creating an interactive ecosystem. The rest then tends to follow. Basic requirements are lateral thinking plus the ability to make good observations. A good conventional farmer will make a good organic farmer.

Many farmers begin slowly and take one aspect at a time, for example using fish fertiliser or homeopathy, trying other things once they are comfortable to do so. They join a discussion group, or find a mentor, or 10 Organic Pastoral Resource Guide an email network to keep in touch with others.

There are many methods around and many farmers use a combination as to what suits them. The reality is that things are never perfect and we are always learning. You then begin to redesign your operation. You resolve the problems not through efficiency or substitution but by looking at why they are there and how you can work with nature. You may begin to look at your farm as a dynamic organism made up of interrelated processes and activities. The closer one can come to this organism being self-contained the better.