

## **‘Ecological dictator’ needed for security of land use**

**Currently, fertile agricultural soils are being consumed by an increasing rash of concrete. This cannot continue as such soils are finite and limited, say scientists from the European SUSVAR network. The conflict of interest between sustainable land management, farming and society will increase in future unless immediate action is taken. They stress that there should be a focus on multifunctional and integrated approaches, including education at all levels of society. The benefits are many, for everyone, and the sustainability that emerges is essential.**

There is a major issue with the loss of agricultural land, other natural resources and energy. The main reasons are a combination of increasing population, urban growth on good land and the abandonment of poor agricultural land.

Fifty scientists from 21 countries recently attended a workshop to discuss their vision of sustainable land use in 2020. This interdisciplinary group of European scientists from the COST action SUSVAR<sup>1</sup> gathered at Karrebæksminde in Denmark to conclude on their 4 years project and to formulate recommendations.

The main issue recognised during the workshop relates to erosion of the links between land management, farming and society. In order for land management to be sustainable this primary issue needs to be addressed rapidly. Multifunctionality and integration of whole systems is the key. This integrates food, energy production and us as well as ecosystem sustainability with social aspects in systems appropriate to localities. At present this approach hardly exists, but there is a desire that by 2020 it will be common.

Education at all stages of life is at the core of the strategy put forward to achieve this aim. It represents the main tool by which people can be made aware of the advantages of responsibly using natural resources, landscapes and the environment as well as their many interactions. All of society should be involved in this movement to spread understanding of the importance of the issues involved. Information can be delivered using a variety of methods, tailored to achieve maximum impact across all age and social classes. Particular attention will need to be made to the continuing development of the managers of land including the knowledge, skills and the introduction of improved practices, based on sound scientific principles. The underlying science will need to be focused much more on a holistic systems approach than is currently the case.

A major key for success in the use of this research depends on a new balance between agroecological and biotechnological engineering. The solution to sustainable land use lies in a global participatory approach involving everybody. For instance, from both the economic and environmental points-of-view, it is more efficient, effective and cheaper to supply water from a watershed converted to organic farming than to clean water in water purification plants as shown by the experiences in Munich, several Swiss cantons and New York. Frequently, later sowing of autumn cereals to control aphids and some diseases is likely to be more efficient than either pesticide use or sophisticated biotechnological breeding approaches. Why complicate the issue when simple methods, such as these, are all that is needed to reduce inputs and energy costs? Chemical and biotechnology should be regarded as tools and not as the heart of the system. Here, the use of marker assisted breeding to accelerate the introduction of resistance to the powdery mildew disease in barley has already proven its usefulness.

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<sup>1</sup> COST action 860 SUSVAR (Sustainable low-input cereal production: required varietal characteristics and crop diversity)

New criteria are needed to allow us to move away from the present focus on maximum yield to an optimum which takes into consideration the economic, ecological and societal aspects of final yield. One example is agroforestry which is the integration of trees into farming systems to produce a wide array of positive interactions among trees, crops, animals and the farmer. For example, trees can provide shelter and browse (forage) for animals, habitat for beneficial insects and nutrient supplement for plants through fallen leaves in the autumn. On the other hand, the presence of crops among the trees can reduce the spread of pests and diseases among the trees and their competition for resources, such as light, nutrients and water. These are 'free' ecological benefits that can lead to overall higher productivity from one unit of land, relative to crops, trees or animals produced separately. In addition, the increased range of products (wood products, energy, biodiversity, and aesthetics) from that unit of land can extend income and employment while limiting, or eliminating, the use of synthetic inputs, particularly in organic agroforestry.

Such complex and fully integrated systems can provide the ingredients for healthy and comprehensive food systems and cultures, including production and distribution, with a high level of economic, social and environmental security. In addition, these systems provide benefits in many other directions. On the biological side, this includes a wide range of ecosystem services (e.g. carbon capture, clean water, healthy biodiversity, insect pollination, decreased pollution), all of which at present are highly undervalued by much of society. The diversity and complexity of these systems also lead to attractive and stimulating landscapes.

For society, there is a host of other potential benefits including wider and more secure employment, the potential for care of disadvantaged and elderly people, and the delivery of cheap, local energy sources.

So why do we need an ecological dictator? We need one to force a rapid paradigm shift from consumption of resources to one which maintains or even generates them, before it's too late.

Agroforestry links: <http://www.montpellier.inra.fr>; <http://www.macauley.ac.uk>,  
<http://www.ukagriculture.com>.

**Statement of attribution:**

This discussion document for non-specialist readers is one of a series produced by the European interdisciplinary COST860 SUSVAR Scientific Network during the SUSVAR Visions workshop<sup>2</sup>. This network aims at delivering required varietal characteristics and crop diversity for sustainable low-input cereal production.

*For more information, [www.cost860.dk](http://www.cost860.dk)*

*or*

Chair of Network: Hanne Østergård, Risø-DTU, Roskilde, Denmark

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<sup>2</sup> SUSVAR Visions workshop with 55 participants from 21 countries: Sustainable cereal production beyond 2020: Visions from the SUSVAR network, Karrebæksminde, Denmark, 14-16 April 2008.