Introduction to final section – Perspectives for participative systems oriented research

Jan Verhagen[1], Hans Langeveld[1] and John Dixon[2]
[1]Wageningen University and Research Centre, The Netherlands; [2]CIMMYT, Mexico

Rural areas and more specifically, but not exclusively, agriculture are facing serious challenges. Ecological services are rapidly eroding and economic conditions are becoming increasingly more difficult, in many areas leading to deteriorating living conditions and social environments. Responses to the symptoms of climate change (*e.g.*, increasing temperatures, erratic rainfall patterns, *etc.*), to large-scale outbreaks of animal diseases, and to increasing competition for land (*e.g.*, for industrial purposes, housing or nature development) and water often are inadequate. General support for current land use practices is declining. In many countries, an increasing proportion of the population is living in urban centres and the contradictions between the highly populated and economically better-off urban areas, on the one hand, and depopulating, poor rural areas, on the other, are becoming more evident.

While it is clear that change is needed, it is less clear what the available options are, which opportunities lay ahead, what adaptations must be made, and how research can play a role in realising the potential of rural areas. Participative systems-oriented research, integrating multi-disciplinary knowledge at different scale levels, may be a useful instrument in defining viable solutions. Knowledge alone may not be sufficient to support decision-making and problem-solving in multiple-stakeholder arenas and integrative, participative processes may be required to transfer conflict into concerted action.

To have an impact on the improvement and development of rural areas, research needs to involve different stakeholders, including farmers, civilians and policy makers. They need to participate in problem formulation, to identify effective policies and farming practices, and assist in the adoption of such practices. Although agricultural research traditionally focused largely on intensification and expansion, it is increasingly taking on board rural and environmental issues, often combining input reductions with participative processes and technological innovations. Another re-orientation is the shift from a single component to a systems-oriented approach integrating knowledge of biophysical and socio-economic disciplines. While regional differences exist in foci of agricultural policy and farmers' objectives, in many cases the major emphasis is on the farm household as the level where crucial decision making level in agricultural systems is taking place.

In his presentation delivered at the 17th IFSA symposium in Florida, David Norman (2002) presents a historical overview of the development of a large number of systems-oriented, participative research approaches. But more approaches exist, two of which will be discussed here briefly.

The Nucleus Pilot Farm Research Approach (NUPFRA) has been developed in environmental research projects in The Netherlands. It focuses on ecological and economic performance of farming systems, using ecological (nitrogen surplus, groundwater nitrate concentration and residual mineral soil nitrogen), and economic (farm income, additional costs made for improvement of the system) indicators. NUPFRA combines process research on experimental farms with applied research on commercial pilot farms, using results of an extended monitoring system in the guidance of the pilot farmers (Langeveld *et al.*, 2005).

NUPFRA describes land use and farming activities in detail, defining farm compartments and internal and external material flows, and applying indicators in an integrative, multi-disciplinary assessment of farm performance. It is a data-intensive approach in which land use activities are sequentially evaluated in an intensive, participative process involving farmers, advisors and researchers. An application is discussed in the paper 'Improving nitrogen management on arable farms in a participative project in The Netherlands' by Langeveld *et al.* (section 5).

Farmer Field Schools (FFS), a less formal participatory training approach, is found at the other end of the spectrum. FFS utilises participatory methods to improve analytical skills, critical thinking, and creativity of farmers', and helps in the decisions making process. Trainers are viewed as facilitators rather than instructors, and interactive learning and field-experimentation is used to teach farmers to experiment and improve their problem-solving capacities (Godtland *et al.*, 2003). FFS was developed to introduce knowledge-intensive integrated pest management (IPM) practices for rice, but has since then been adapted to work with other crops and diseases and other problems such as human health, and has spread rapidly across Asia, Africa, and Latin America. See Tripp *et al.* (2005) for a review of its potentials. An application of FFS is discussed in the paper by Vaarst et al (this section).

The approaches discussed here are only two in a range of alternatives. Notwithstanding their differences, both are useful to discuss alternatives in land use practices at the farm and at the regional level. They facilitate analysis of actual and future systems, using a range of disciplines, and relatively simple indicators that appeal to farmers, advisors, researchers and policy makers and thereby allow exchanges of ideas and insights during a process of strategic cooperation.

References

Godtland, E., E. Sadoulet, A. De Janvry, R. Murgai and O. Ortiz, 2003, The Impact of Farmer-Field-Schools on Knowledge and Productivity: A Study of Potato Farmers in the Peruvian Andes. http://www.farmerfieldschool.net/document_en/Knowledge-Nov03.pdf.

Langeveld, J.W.A., H. Van Keulen, J.J. De Haan, B.M.A. Kroonen-Bakbier and J. Oenema, 2005. The nucleus and pilot farm research approach: examples from The Netherlands. Agricultural Systems 84, pp.227-252.

Norman, D.W., 2002. The Farming Systems approach: A historical Perspective. Presentation at the 17th Symposium of the International Farming Systems Association, Lake Buena Vista, Florida, November 17th-20th, 2002. http://conference.ifas.ufl.edu/ifsa/papers/invite/Norman.doc

Tripp, R., M. Wijeratne and V. Hiroshini Piyadasa, 2005. What Should We Expect from Farmer Field Schools? A Sri Lanka Case Study. World Development Vol. 33, No. 10, pp. 1705–1720.