Systems thinking, interdisciplinarity and farmer participation: essential ingredients in working for more sustainable organic farming systems

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ABSTRACT

This paper discusses the principles and values behind some of the innovative agricultural research methods which have evolved over the past 30 years in many countries and suggests that the lessons from this experience could have significant benefits in the development of organic research in the UK. The author argues that the key elements which need to be incorporated into a new approach to research on organic systems are:- systemic thinking (the need for a more holistic understanding of the context of farming and rural livelihoods), interdisciplinarity, (contributions from both social and natural science in the research process) and farmer-participation (the active participation and partnership of farmers and other key stakeholders in the process of design, planning, implementing, monitoring and evaluating research). By incorporating these principles, both into the vision of what research can become within in the organic movement, and into the methodologies that are used in new research partnerships, it is suggested that we could learn our way towards more sustainable, organically-based rural livelihoods in the future.

Keywords: systems and systemic thinking, interdisciplinarity, farmer- participatory research

INTRODUCTION

The background to the growth in importance of participatory and systemic methods in many countries began with the questioning of the role and relevance, both of normative science and of formal, reductionist research methods. Such methods were adopted by research systems, stations, sub-stations and model farms which were set up to verify the superiority of modern, often exotic, materials and technologies over indigenous ones. Such an approach was strongly driven by policies which supported capital intensive, yield enhancing, labour displacing, technologies.

This approach has been shown to have had only partial 'success' and it has imposed a very high environmental and human cost. The reasons for these failures may be attributed to: - the lack of the human dimension in the research process, the obsession with yield maximisation at almost any cost, the dominance

of disciplinary and reductionist science and its consequences and the weakening of linkages between research, education, extension and practice .

A NEW APPROACH

The key principles which have had an impact in recent years in changing the dominant paradigm within many research systems are described below.

Systems thinking and farming systems research

Farming systems research grew up in the 1970's, partly as a response to the failure of conventional positivist-reductionist research to address the agricultural problems and livelihood strategies of small farmers in the least developed countries. It was also a counter to the clumsy attempt to modernise agriculture through the Green Revolution, which had befitted relatively well off farmers and has had long term negative social and environmental costs.

'The key elements of farming systems research include a holistic approach, orientation towards the needs of defined target groups, high levels of farmer participation and hence co-learning by farmers and specialists. There is guidance by facilitators, continuous evaluation and linkage to policy makers' (Petheram & Clark, 1998). It is now widely acknowledged that the farming systems research approach has made significant contributions to the improvement of agricultural research and education systems throughout the World. (Collinson, 2000).

Although farming systems research was initially grounded in a 'hard systems science' tradition, it was realised by most practitioners that the approach needed to address problems in a systemic way in order to make a contribution towards the development of more sustainable farming systems. This called for an acknowledgement that systems are constructs of the mind. Systemics are therefore ways of viewing the world, systems as wholes have properties that are unpredictable from the known properties of the individual components, linkages between elements and their environment are interdependent and systems may be open or closed. (Bawden, 1995). The acceptance that there are many different perspectives of reality and that there is a need to understand interdependency and context has emerged from many writers in fields other than agriculture, including Checkland (1981, 1995).

Interdisciplinarity

The second element that has had a profound influence on the effectiveness of applied research in recent years is the rediscovery of interdisciplinary thinking as an essential approach to analysis and action within systems research. The need for interdisciplinary thinking has been brought about by the dominance of disciplinary and commodity-based thinking which still dominates agricultural educational systems and institutions which are concerned with natural science research. Such thinking focuses on expert-based research, on positivist-realist epistemology, on problem solving, on control and manipulation of environments and on designed solutions. In contrast, interdisciplinary approaches address

problems within a context, focus on adaptive learning and management, on improving situations, involve teams and coalitions and networks and accept that outcomes are ambiguous, fuzzy and conditional. (Jiggins & Gibbon, 1997).

Interdisciplinary approaches would seem to be essential for the future of organic research as we are dealing with complex, inter-related systems of crops, pests, diseases, nutrients, livestock and human resource management. Much of the research that is supported and implemented so far has been similar to conventional research in that it is driven by funding policies and strategies which are mostly short term and focused on alternative technologies which are designed to solve short-term problems.

The greatest problem that we face with respect to this issue is that most natural scientists are still trained in increasingly narrow disciplinary fields and therefore have great difficulties when faced with a situation which demands a more holistic vision and way of thinking. Many institutions and funding agencies still do not encourage the interaction of social and natural scientists when working to solve complex problems. The creation of teams may help but this can also lead participants to hold onto their 'discipline' and result in multidisciplinary projects and programmes which never truly integrate their thinking. However, the willingness of scientists to learn and adapt their thinking through interaction with farmers (who have no problems with the interdisciplinary concept) may be the key to constructive change here.

Participatory action and shared, experiential learning

Unfortunately, the term 'participation' has been hijacked by everyone who finds it convenient to do so and its meaning can vary from contracted forms of interaction to a truly co-learning mode of operation. In this context we define participation as the active partnership and participation of farmers and other key stakeholders in the process of design, planning, implementing, monitoring and evaluating research. Although much as been written about participatory research methods and participatory learning and action in the South, (Haverkort *et al*., 1991; Okali, Sumberg &Farrington, 1994; Scoones & Thompson, 1994) there are now increasing numbers of valuable experiences from the industrialised countries (eg. Cerf *et al*., 2000; Hamilton, 1995; Roling & Wagemakers, 1998) which will help to inform us of the value of farmer- partnerships and integrated systemic learning.

CONCLUSIONS

Some researchers might argue that many of these approaches are already in place, but it is true that few have been incorporated into mainstream technical, natural resource research planning and practice. With the present system of research funding and assessment, it may be difficult to introduce radical changes, but with a new vision, goal and purpose, and co-operation from all the major actors, it may be possible to evolve a very different form and approach to research and development in organic farming and to achieve the goal of more sustainable future rural livelihoods.

We have sufficient evidence from many research systems, both from the North and the South, that the elements discussed above can be complementary to existing research approaches and, most importantly, they can liberate and empower farmers who have been on the receiving end of both good and bad science and good and bad research policies and strategies for too long. Perhaps this is the time for some innovative thinking about the future of organic research and it is hoped that this workshop might give the lead in initiating a dialogue on the purpose and value of farmer-participatory research groups which have proved to be successful in many other countries.

REFERENCES

Bawden R (1995). On the systems dimension in FSR. *Journal for Farming Systems Research-Extension.* Vol 5. No. 2. 1995.

Cerf M; Gibbon D; Hubert B; Ison R; Jiggins J; Paine M; Proost J; Röling N (2000). Cow up a Tree. Knowing and Learning for Change in Agriculture. Case Studies from Industrialised Countries. INRA. Paris. 492pp.

Checkland PB (1981). *Systems thinking: Systems Practice*. John Wiley. Chichester.

Checkland PB (1995). Model Validation in Soft Systems Practice. *Systems Research.* 12: 47-55

Collinson, M. (2000). A History of Farming Systems Research. FAO/IFSA/CABI. 432pp.

Hamilton NA (1995). Learning to Learn with Farmers. PhD Thesis, Univ. Wageningen. Netherlands

Haverkort B; van der Kamp J; Waters-Bayer A (eds.) (1991). Joining farmers' experiments. Intermediate Technology Publications. 268pp.

Jiggins J; Gibbon D (1997). What does interdisciplinarity mean ? 13th European Seminar on Extension Education. Dublin 1-6th Sept. 1997. pp 13.

Okali C; Sumberg J; Farrington J (1994). Farmer Participatory Research. ODI. 159pp.

Petheram RJ; Clark RA (1998). Farming Systems Research: relevance to Australia. *Australian Journal of Experimental Agriculture, 1998,* ***38,*** 101- 115.

Röling N; Wagermakers MAE (1998). *Facilitating Sustainable Agriculture*. 318pp. Cambridge University Press.

Scoones I;Thompson J (1994). Beyond Farmer First. IT Publications. 301pp.

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