

# COW UP A TREE

## Knowing and Learning for Change in Agriculture Case Studies from Industrialised Countries

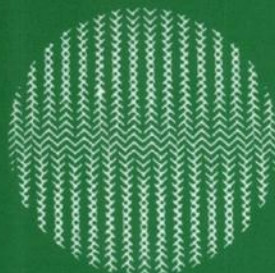


Editors

LEARN Group  
(Learning in Agriculture Research Network) :

M. CERF, D. GIBBON, B. HUBERT, R. ISON, J. JIGGINS,  
M. PAINE, J. PROOST, N. RÖLING

SCIENCE UPDATE



**INRA**  
EDITIONS



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Cow Up a Tree. John Kelly, 1999

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## Foreword

In dealing with innovative approaches to backing agricultural development in industrial countries, this book comes at a most opportune time when the technological models which have prevailed in the last decades are being challenged. The authors' standpoint is that new forms of co-operation among farmers, agricultural extension and development agents, scientists and other stakeholders of the rural world need to be devised in order to help the organisations and stakeholders concerned enhance their capacity for autonomy, design and implementing of the technical, institutional and political innovations that will enable them to gain control over their own future.

This work draws on concepts and methods that have proven their relevance in other areas such as education or industry. Fifty-two authors from ten different countries have contributed twenty-eight papers to this book, with a good balance between more theoretical contributions and case studies. In opting for this complementarity, the editors sought to avoid producing theoretical constructs far removed from real world situations, while at the same time giving sense to concrete experiences which, on their own, cannot result in, or build up generic knowledge.

As Chairman of INRA, I appreciate the involvement of our Institute, and more specifically that of the *Département Systèmes Agraires et Développement* (SAD) - the initiator of this publication - in this endeavour. As a sociologist, I am also particularly interested in the book's topic (*Knowing and Learning for Change in Agriculture*) which contributes to setting the foundations of a new paradigm in research on change in agriculture and the rural world. The changes occurring in our industrial societies compel us to reconsider the place and role of agricultural activities and turn our attention to the technical and organisational innovation processes underpinning these evolutions. Given the complexity of these issues and the diversity of the stakeholders involved, we can no longer keep to the linear knowledge models that have been applied over the past half century: they have shown their limitations when applied in the field. Supported by recent advances in knowledge on the forms of collective and organised action, the participatory learning processes that are being

proposed appear to provide appropriate means for backing the necessary adaptation of farmers to the new and diversified stakes with which they are faced and which are encapsulated in the concept of 'multifunctionality of agriculture': i.e. food safety and quality, preservation of the physical and living environment, maintenance of jobs in rural areas, land use planning and management, etc. Agriculture thus emerges as an exemplary field of action for recasting the relations between science and society, a challenge INRA cannot ignore

As pivotal actors of a rural world developing ever closer links with urban systems, farmers are increasingly involved in these complex stakes, which question the diverse functions, at long last recognised, of their agricultural activities, following decades of exclusively considering their sole function as food providers. We must now move a step further and produce the methods and standards that will give the multifunctionality concept its full operational capacity and promote its wide international recognition. To achieve this, general principles will need to be elaborated from the creative capacities of actors situated in their local context: the facilitation and conceptualisation of learning and knowing processes in collectives will doubtlessly be a crucial feature of this approach.

It is clear that we are now entering a stage where the concepts and methods backing agricultural development are to be profoundly renewed. Thus, I expected this book to address at greater length the consequences - which I deem considerable - that the inevitable development of new communication technologies will have for these methods: the Internet has already entered many of our farms. But no matter: the debate is far from closed!

Now to the international scope of this book for which I wish to congratulate its editors and authors. Our agricultures must seek the ways and means for a renewed and stronger anchoring in broader society, tuned to the expectations of consumer-citizens. This reflection can only take place at the international level if it is to be technically credible and politically tenable. The debate thus engaged is also essential in my opinion for positioning our industrial agricultures in relation to political and technical objectives that are compatible with equitable development in Northern and Southern countries. Agricultural research in industrial countries must urgently consider its contribution to new development models that are more harmonious, more sustainable and more equitable. Therefore, I sincerely wish the collaborative effort engaged so far to continue and encourage the group whose initiative it was - the LEARN@paris group - to pursue their work at the European scale by concretising their activity in co-operation projects in research and higher education and by broadening their audience in order to foster a community of scientists and practitioners who will work on these issues.

Paris, July 2000

Bertrand Hervieu

Chairman, Institut National de la Recherche  
Agronomique

## Part I

### **Introducing Learning and Knowing Processes**



# The 'Problematique' with Respect to Industrialised-Country Agricultures

B. HUBERT, R. L. ISON, N. RÖLING

## Abstract

*The economic, social and ecological factors which give rise to a contemporary 'problematique' in agricultures in industrialised countries are explored. The current situation has emerged from a half-century commitment to linear models of technological improvement and social change characterised as the 'agricultural treadmill'. We argue that this treadmill has found its limits. New issues are emerging from present debates involving a large number of stakeholders outside of the traditional agricultural world. Examples include environment preservation, food safety and quality, rural and urban relationships, employment and multifunctionality of farm activities. This context perpetuating: (i) past practices and alliances and (ii) the historical commitment to the view that development is an appropriation of knowledge produced outside the farming spheres, will consign farmers' associations, extension services, agricultural research and training to remain on the agricultural treadmill. Instead there is a need for a change in practices associated with knowing and learning. This change needs to be tackled from both theoretical and methodological angles to support the collective action of a wide diversity of new actors having scant experience of working together. Research, education and training are then faced with a major discontinuity that requires ongoing learning and knowledge production processes occurring inside a diversity of collectives. Triggering these new approaches is the challenge of this book.*

## The 'story' of the book - Prologue

We met the 'cow up a tree' which features in the title of our book during a night walk on the Avenue des Champs Elysées in Paris after a busy meeting of the editorial panel. Amongst the many works of art on display during the 1999 Paris Biennial this piece by John Kelly (see cover design) captured our imagination for two reasons. Conceived by an artist of Anglo/Irish origin but resident in Australia and displayed in Paris, it reflects the international

nature of the contributions to this book. Perhaps more profoundly, it captures in metaphorically stark terms the uncertain future that some consider agriculture in the Western world to now face. It was Aurelio Peccei, first president of the Club of Rome, who coined the term ‘the problematique’ in the early 1970s to describe the complex of interrelated problems which humanity faced in the latter half of the 20th century - overpopulation, increasing stress on environmental systems; worsening shortage of cultivable land and exhaustion of key resources (Roberts, 1994). The complex set of interrelated problems and opportunities now being experienced in contemporary industrial-country agricultures combined with the rich experience of failure and limited success in agricultural development efforts in poorer countries prompt our concern with learning and knowing processes. This is the ‘problematique’ which we explore in this chapter, and which provides the context for this book.

As individual authors we have been engaged in meaningful conversation for over a decade. However, this is our first act of collaborative writing. Our personal experiences arise out of contrasting professional traditions within the broad setting of modern agriculture. We have come from the French tradition of systems research in agriculture, the Anglo-Australian traditions of grassland agronomy, rangeland ecology and, more recently applied systems research, and the Dutch tradition of ‘social agronomy’<sup>1</sup>. Our recent conversations have been more concerned with the subject of this book, “*Learning and knowing processes for change*” and, related to this, systems thinking and practice. The occasion of the 3rd European Symposium on Rural and Farming Systems Research in Hohenheim in 1998 was used as an opportunity to give impetus to these conversations. A satellite workshop concerned with ‘Learning Processes in Developed Agricultures’ was proposed and facilitated by staff of the Systèmes Agraires et Développement (SAD) Department of INRA. It was from this workshop that this book proposal and the editorial team emerged. SAD and INRA have continued to facilitate and support, in a number of ways, the development and production of this book.

Common concerns with learning and knowing processes have brought us and the other members of this book’s editorial panel together. All of us have carried out scientific work in close collaboration with agricultural and rural development partners, often in developing, but mostly in industrialised countries. From our collaboration we have come to believe there is an urgent need to reconsider what is at stake in the different agricultures which characterise industrialised countries. Our perspectives, and thus motivation, for engaging with these issues is not homogeneous. For example there are those who have the conviction that a new paradigm is beginning to emerge now that the conventional technical/economic paradigm seems to be leading Western agriculture into economic, environmental and ecological crisis, land use conflict, and consumer disapproval and mistrust. Those who take this perspective find this new trajectory exciting and are motivated to capture the new perspectives and practices that are emerging. Others argue that the process is likely to be less of a catharsis, and thus fundamental paradigm shift, than an ongoing historical unfolding of contested rationalities.

The purpose of our initial workshop was to gather researchers from industrialised countries in the Northern and Southern hemispheres who were working on innovation in

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<sup>1</sup> These are our personal traditions and do not refer to the range of traditions of authors contributing to the book.



agriculture in situations of change induced by factors such as the liberalisation of market prices, concerns over food quality and safety and emergent environmental concerns. Our aim was to resist, in the sense of Foucault (Rabinow, 1986), the view that agriculture is an activity whose sole purpose is the production of standardised products dictated by an increasingly global market. In our experience agriculture increasingly is becoming a multi-purpose activity:

- The production and maintenance of the environment based not only on ecological criteria but also in relation to its particular social 'history' and in synergy with its other non-agricultural uses;
- The provision of safe foods having high biological and organoleptic (taste, smell, touch) qualities, which will at the same time serve to enhance a particular feature of a locality's identity as well as ensuring that it endures and helping it to evolve;
- The performance of functions that acquire new values in response to evolving western urban society (changing consumer demand, political alliances, etc.), such as the delivery of ecological services (providing drinking water, closing cycles, providing space and recreation, etc.).

These new demands on agriculture require innovation and learning, not just by individual farmers in their enterprises, but within collectives associating farmers, researchers, advisors, consumers and other stakeholders. In the recent past, the development of the agricultures in industrialised countries has benefited from strong public and private backing to support the continuous productivity gains which have characterised western agriculture. Agricultural research has played a prominent role in this. However, research, advisory and other support structures now are challenged to adapt to the new context characterised by a changing relationship between agricultures and the societies of which they are a part. This is increasingly a source of uncertainty with many issues and potential trajectories being highly contested.

New modes of collaborative adaptive management among farmers, scientists, consumers and other stakeholders in the rural world need to be developed. Indeed, the agricultures in industrialised countries will only be able to meet the new challenges by improving the ability of the stakeholders in them to learn and act collectively. Our experience suggests that interactive concepts and methods which have been widely applied with varying success in diverse and often critical situations in developing countries can be expanded and developed to benefit western agriculture, which up to now has been managed on the basis of linear models of knowledge dissemination and utilisation. Such is the debate we wish to introduce in this book.

The editors and contributors to this volume have tried to capture a particular set of responses to this challenge even though they are still tentative in many ways. We hope that the book will trigger new networks of conversation as well as strengthen existing ones. The editorial process has been consistent with the collaborative learning and action which we espouse for western agriculture. For that reason, and as a signal of our ongoing interests, we have adopted the collective name LEARN or LEarning in Agriculture Research Network.

## The 'problematique'

A central question facing agricultural professionals is how to reintroduce agricultural activities in a changing world, where activities are less specialised, more flexible and more embedded in the social and economic issues of the whole society. Alliances between traditional stakeholders in agriculture are breaking down and are in need of renegotiation. This complex of issues could be characterised as the negotiating and renegotiating of new relationships, not only between people but with our biophysical environment (Ison and Russell, 2000). It is possible to recognise an interrelated set of factors with the potential to shape these negotiations and renegotiations. One can only speculate whether collectively they represent a threshold of discontinuity with respect to western agriculture:

- The proportion of the consumer Euro spent on beverage and food has declined to about 10% in most industrialised countries although, in Britain at least, the proportion of total household expenditure on food has increased. The greatest part of this expenditure goes to processing, packaging, transport and retailing. Farmers' returns as a proportion of total sales have thus continued a historical decline because food has become abundant and farm-gate prices have decreasing political priority in most countries. The erstwhile high societal return to public investment in agricultural productivity through traditional modes of research, extension, and land development in terms of reducing food prices and releasing labour (e.g., Evenson *et al.*, 1979), is no more. The success of modern agriculture in terms of continuous productivity gain has for the moment become irrelevant, except in terms of success in global markets, and that success has become more a matter of negotiation and power than of market prowess.
- Relentless competition at the global level and among farmers within a region or country, leads to a continuing price squeeze for most agricultural products, which in turn affects incomes of farmers in all industrialised countries to a point where, in some cases, whole agricultural sectors are threatened with discontinuity, and in others, large numbers of farmers feel compelled to stop operating. The viability of rural areas is threatened. It can be argued that the market fails when it comes to sustaining farming and rural communities. The specific nature of the farming industry with its many relatively small producers leads to a 'perfect market' which destroys itself (Galbraith, 1995). Wealth flows irreversibly out of agriculture so that consumers and other producers not primary producers capture the benefits from farm innovation.
- The need to cut costs can compel farmers and related industries to ignore the quality of farm products and breach the ecological and health standards for production methods. Consumer scares, loss of biodiversity and diversity of landscapes, nitrate pollution of subterranean drinking (and mineral) water supplies, controversies about genetically modified organisms, toxic emissions, and other threats to natural resource processes, have undermined public trust and tarnished the public image of agriculture in many countries.

- In most industrialised countries, farmer groups, NGOs, activists, and innovative entrepreneurs are demonstrating tremendous creativity and ingenuity in coming up with responses to market failures (e.g. there are now over 200 farmers' markets in the U.K., few of which existed a decade ago). However, there are questions to be explored as to the sustainability of such innovations within the overall structure of industrialised country agricultures.
- Although farming is mainly a private industry on land owned by farmers, there is an increasing tendency to intervene in this private management and ownership from various public goods perspectives, be it the conservation of biodiversity for nature and hunting interests, the maintenance of culturally valuable landscapes, the sequestration of carbon dioxide, the collection of clean drinking water, the recycling of organic waste, or the removal of sources of river and estuary pollution. Hence political practice is beginning to deviate from the neo-liberal discourses which generally still shape policy rhetoric if not, in fact, policy mechanisms (in the European Union, at least).
- The dominant linear paradigm of agricultural innovation based on delivery to, and diffusion among, farmers of technologies developed by science (e.g. Rogers, 1995), has lost its utility as an explanation of what happens. International agricultural research institutes based on the promise of 'cutting edge science' as a solution to global food security and poverty problems are finding it hard to obtain funding. There is a search for new models of innovation and new roles for science (e.g. Funtowicz and Ravetz, 1993; ESRC, 1999).

In all, the 'agricultural treadmill' (Table 1), the largely unquestioned basis for decision making about agriculture, has run its course. The policy theories, such as the diffusion of innovations (Ryan and Gross, 1943, Iowa), the agricultural treadmill itself (Cochrane, 1958, Minnesota) and the utilisation of scientific knowledge (Havelock, 1986 based on earlier work, Michigan), that emerged in the typical conditions of the American Mid-West have, by solving old problems, generated new ones.

These factors, together, challenge political choices as well as the procedures for administering and supporting agricultural activity. Trapped in a conflicting dynamic between the stakes of globalisation and competition and those of sustainable development, policies fluctuate between highly liberal approaches and others that are more 'socially orientated', depending on the countries considered and the stages in international negotiation.

Liberal, or more specifically, doctrinaire rationalist economic policies force farmers to stay on the treadmill (Table 1) which began some 40 years ago and which has led to standardisation of products and production techniques. This course has resulted in increased farm size and livestock numbers per farm and a parallel decrease of farm labour. It has also generated a competitive global market for food commodities, which has intensified the productive specialisation among continents, among countries and among farmers within each country. It has stimulated the emergence of global life science and food companies who now have potentially greater power to affect long-term food security than (inter)national policy. As with many historical phases of change these have caused increased marginalisation of some

rural regions, uncompensated by industrial development at the national level, which could absorb labour released by the decline or cessation of agricultural activity. It has also increased the dependence of developing countries on industrialised countries, including for their own food needs.

In sharp contrast to the neo-liberal focus on global competition based on economic rationality stand approaches centred on ‘sustainable development’ based on ecological rationality (see Fig. 1). They are operationalised in political, market-regulating decisions seeking development, democracy, employment and sustainable land use planning (see Røling and Wagemakers, 1998). They provide regulatory measures, incentives for action and in some cases financial support, justified by arguments such as (1) the diversity of farming, (2) the environmental destruction caused by many forms of modern agriculture and (3) the so-called multi-functionality of farming activities.

**Table 1.** Features of the agricultural treadmill (after Cochrane, 1958; Røling *et al.*, 1998).

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<b>The basic mechanism</b>
<ul style="list-style-type: none"><li>- Many relatively small farms all produce the same product;</li><li>- Since no one can affect the price, all try to produce as much as possible against the going price;</li><li>- A new technology allows those who use it first to capture a windfall profit;</li><li>- After some time others follow;</li><li>- As production increases the price drops;</li><li>- Those who have not innovated must innovate to keep up their income (price squeeze);</li><li>- Those who are too old, small, poor or whatever to innovate eventually drop out; Their resources are absorbed by those who capture the windfall profit (scale enlargement).</li></ul>
<b>Benefits for policy makers</b>
<ul style="list-style-type: none"><li>- Efficiency gains of technological change are passed on to the consumer in the form of cheaper food and fibre;</li><li>- Labour is freed for other pursuits;</li><li>- National agriculture becomes more competitive;</li><li>- The speech-making farmers do not complain (they make the windfall profits);</li><li>- The process requires a relatively small investment in research and extension (high rate of internal return).</li></ul>
<b>Unwanted side effects</b>
<ul style="list-style-type: none"><li>- Alternative employment might not be available to beggaring farmers who drop out;</li><li>- Companies not consumers capture the benefits;</li><li>- Farm incomes eventually are not sustainable as farmers compete each other to extinction. A perfect market destroys itself (Galbraith, 1995);</li><li>- Global competition drives out national agricultural industries, undermining long term food security;</li><li>- Market pressure leads to unsustainable forms of farming (pollution of the environment, destruction of landscapes, loss of biodiversity);</li><li>- Market pressures lead to loss of local and contextualised ways of knowing (craft, indigenous or situated ways of knowing and acting).</li></ul>

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As indicated in Figure 1, moving towards sustainable development involves holistic decision making (Open University, 2000). Innovation therefore involves trade-offs among economic viability, social desirability and ecological sustainability (for many the bottom