Communication for Rural Innovation

Rethinking Agricultural Extension

Third Edition

Cees Leeuwis

with contributions from

Anne Van den Ban

Blackwell Science

CTA

This Page Intentionally Left Blank

Communication for Rural Innovation

Rethinking Agricultural Extension

Third Edition

Cees Leeuwis

with contributions from

Anne Van den Ban

Blackwell
Science

CTA

First Dutch edition © Boom-Pers 1974, 1985
First English edition © A. W. van den Ban & H. S. Hawkins 1988
Second edition © 1996 by Blackwell Science Ltd
Third edition © 2004 by Blackwell Science Ltd
a Blackwell Publishing company

Editorial offices:
Blackwell Science Ltd, 9600 Garsington Road, Oxford OX4 2DQ, UK
Tel: +44 (0) 1865 776868
Iowa State Press, a Blackwell Publishing Company, 2121 State Avenue, Ames,
Iowa 50014-8300, USA
Tel: +1 515 292 0140
Blackwell Science Asia Pty Ltd, 550 Swanston Street, Carlton, Victoria 3053, Australia
Tel: +61 (0)3 8359 1011

The right of the Authors to be identified as the Authors of this Work has been asserted in accordance with the Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, except as permitted by the UK Copyright, Designs and Patents Act 1988, without the prior permission of the publisher.

First published in Dutch by Boom-Pers 1974, 1985
Modified English edition co-published by Longman Scientific & Technical 1988 and John Wiley & Sons, Inc. under the title *Agricultural Extension*
Second edition published by Blackwell Science 1996
Reprinted 1996, 1998, 1999
Third retitled edition published by Blackwell Publishing Ltd 2004

Library of Congress Cataloging-in-Publication Data
Leeuwis, Cees.
Communication for rural innovation : rethinking agricultural extension/Cees Leeuwis, with Anne van den Ban.
p. cm.
Includes bibliographical references and index.
ISBN 0–632–05249–X (softcover: alk. paper)
1. Agricultural extension work. I. Leeuwis, Cees. II. Ban, A. W. van den.
III. Technical Centre for Agricultural and Rural Cooperation (Ede, Netherlands)
IV. Title.

S544.L35 2003
630′.71′5—dc22
2003058372

ISBN 0–632–05249–X

A catalogue record for this title is available from the British Library

Set in 10/12.5 pt Times
by Graphicraft Limited, Hong Kong
Printed and bound in India
by Replika Press Pvt. Ltd, Kundli

The publisher's policy is to use permanent paper from mills that operate a sustainable forestry policy, and which has been manufactured from pulp processed using acid-free and elementary chlorine-free practices. Furthermore, the publisher ensures that the text paper and cover board used have met acceptable environmental accreditation standards.

For further information on Blackwell Publishing, visit our website:
www.blackwellpublishing.com

Contents

Preface x
The CTA xii

PART 1 RETHINKING EXTENSION 1

1 Introduction 3
1.1 Challenges for agricultural extension practice 3
  1.1.1 Challenges for farmers and agriculture at large 3
  1.1.2 Reinventing extension 11
  1.1.3 In conclusion: a new societal function for extension 17
1.2 Objectives and outline of this book 18
Questions for discussion 21

2 From extension to communication for innovation 22
2.1 Historical roots and evolving conceptions of extension 22
  2.1.1 Origins, early meanings and international terminology 22
  2.1.2 Evolving definitions 23
2.2 Different types of communication services and strategies 29
  2.2.1 Basic rationale of different communication services and strategies 31
2.3 Agricultural knowledge systems and other extension-related concepts 36
Questions for discussion 39

3 The ethics and politics of communication for innovation 40
3.1 The political implications of communication for innovation 40
3.2 The acceptability of government communicative intervention 42
3.3 The acceptability of non-governmental communicative intervention 43
3.4 Professional standards 45
3.5 Dilemmas regarding ethics and politics: an example 46
Questions for discussion 48

4 The role of communicative intervention in policy planning: instrumental and interactive approaches 49
4.1 Top–down planning and instrumental communication 49
  4.1.1 'Blueprint' planning and problem solving 49
  4.1.2 The instrumental model of communicative intervention 50
  4.1.3 In conclusion 53
4.2 Process management and interactive communication 53
  4.2.1 Process management towards innovation 53
  4.2.2 Arguments for an interactive model of communicative intervention 55
  4.2.3 In conclusion 56
4.3 Shortcomings and conditions: the relation between interactive and instrumental approaches 57
Questions for discussion 58

PART 2 THE RELATIONS BETWEEN HUMAN PRACTICE, KNOWLEDGE AND COMMUNICATION 59

5 Understanding human practices: the example of farming 61
5.1 Different levels and domains of farming practice 61
  5.1.1 Farming practices at different hierarchical levels 62
  5.1.2 Different domains of farming practice 63
  5.1.3 Farming practices at different points in time 64
5.2 Understanding the social nature of technical practices 65
  5.2.1 Evaluative frame of reference: the basis for reasoning about practices 67
  5.2.2 Perceived effectiveness of the social environment 71
  5.2.3 Perceived self-efficacy 74
  5.2.4 Social relationships and perceived social pressure 76
  5.2.5 The dynamics within the model 79
5.3 Implications for communication for innovation 86
  5.3.1 The central role of knowledge and the need to be modest 86
  5.3.2 The relationship with different communication strategies and functions 86
  5.3.3 Communicative intervention must be ‘tuned’ to other communication processes 88
  5.3.4 The need to anticipate diversity among farmers 89
  5.3.5 Linking multiple socio-technical innovation processes 89
  5.3.6 The multi-layered character of technology and policy acceptance 90
  5.3.7 The illusion of supporting rational decision-making 91
  5.3.8 The need for analytical capacity in communication for innovation organisations 92
Questions for discussion 92

6 Knowledge and perception 94
6.1 Knowledge, perception, information and wisdom 94
6.2 Life-worlds: the locus of discursive (explicit) and practical (tacit) knowledge 96
6.3 Multiple realities and knowledge construction 98
6.4 Knowledge and ignorance 100
6.5 Epistemic cultures: scientists’ versus non-scientists’ knowledge 105
6.6 Knowledge, power, agency and structure 107
6.7 Practical relevance: the case of farmer experimentation in environmental co-operatives 110
Questions for discussion 116

7 Communication and the construction of meaning 117
7.1 What is communication? 117
7.2 Three models of communication 121
7.3 Some basic anticipation problems in communicative intervention 123
Questions for discussion 125

PART 3 INNOVATION AS A PROCESS OF NETWORK BUILDING, SOCIAL LEARNING AND NEGOTIATION 127

8 Changing perspectives on innovation 129
8.1 The 'adoption and diffusion of innovations' tradition 129
  8.1.1 Key conclusions drawn from adoption and diffusion research 130
  8.1.2 Critical reflections and practical limitations 134
8.2 Innovations and processes of innovation design 140
  8.2.1 The multi-dimensional character of innovations 141
  8.2.2 Building effective linkages and networks in an evolutionary process 141
  8.2.3 The need for temporary protection in innovation processes 142
  8.2.4 Different types of innovations and innovation decisions 143
  8.2.5 The problem-driven character of innovation 143
  8.2.6 The 'hidden' nature of building blocks for innovation 144
  8.2.7 Basic tasks in interactive innovation design processes 144
Questions for discussion 145

9 Social and individual learning 147
9.1 A basic model for adult experiential learning 149
9.2 Levels of learning, and the relationship with decision-making 151
9.3 The centrality of relevant feedback 153
9.4 Factors that may affect learning (pre-conditions and obstacles) 155
9.5 Aspects of learning 161
Questions for discussion 162

10 Negotiation within interactive processes 163
10.1 Why look at negotiation? 163
  10.1.1 Conflict-related frictions in interactive innovation processes: six cases 163
  10.1.2 Towards a better language to deal with conflict 168
10.2 Distributive and integrative negotiations 169
  10.2.1 Facilitation tasks in integrative negotiations 170
  10.2.2 The status of facilitation tasks and guidelines 171
  10.2.3 Layers or types of conflict 171
10.3 Pre-conditions for integrative negotiation 172
  10.3.1 Divergence of interests 173
  10.3.2 Mutual interdependence 173
  10.3.3 Ability to communicate 174
  10.3.4 Institutional space for using innovative negotiation results 174
  10.3.5 An implication: the 'political' dimension of facilitation 175
Questions for discussion 176

11 The role of outsiders and different intervention approaches 177
11.1 The relationship between instrumental/persuasive and interactive models: alternation and sequencing 177

11.2 The role and expertise of 'insiders' and 'outsiders' 179
  11.2.1 Different areas of knowledge and competence needed in intervention 179
  11.2.2 From 'experts' and 'laymen' to 'outsiders' and 'insiders' 181
  11.2.3 The role and contribution of external facilitators and scientists 181
Questions for discussion 185

PART 4 MEDIA, METHODS AND PROCESS MANAGEMENT 187

12 The potential of basic communication forms and media 189
12.1 Conventional mass media 190
  12.1.1 The way mass media work 191
  12.1.2 Functional qualities in relation to communicative intervention 192
  12.1.3 Basic guidelines for presenting messages through written mass media 194
12.2 Interpersonal communication 196
  12.2.1 Functional qualities in relation to communicative intervention 196
  12.2.2 Basic modes of administrating group and bilateral meetings 198
  12.2.3 Skills needed for facilitating interpersonal communication 200
12.3 Hybrid media: the internet 202
  12.3.1 Modalities of the internet 203
  12.3.2 Functional qualities of hybrid media 204
  12.3.3 Internet applications for communicative intervention 205
12.4 Media access and audience selectivity 207
12.5 Media mixes 208
Questions for discussion 208

13 Communication for innovation methods 209
13.1 Clarifying the terminology used 209
13.2 Reasons to focus on methods, functions and process management 211
13.3 Specific methods and issues related to farm management communication 212
  13.3.1 Advisory communication 213
  13.3.2 Supporting horizontal knowledge exchange 217
13.4 Methods related to raising awareness and consciousness of pre-defined issues 220
  13.4.1 Mass media campaigns 220
  13.4.2 Entertainment–education 221
  13.4.3 Visualising what is difficult to see 222
  13.4.4 Result demonstrations/demonstration experiments 222
13.5 Methods related to the exploration of views and issues 224
  13.5.1 Analysis of everyday talk 224
  13.5.2 In-depth interviewing 225

13.5.3 Metaplan cards 226
13.5.4 Open space technology 226
13.5.5 Visual diagramming and mapping 227
13.5.6 Ranking and scoring techniques 230
13.5.7 Socio-technical problem tree analysis 231
13.5.8 Joint research and on-farm experimentation 233
13.5.9 Public debates 237
13.5.10 Future explorations 238
13.5.11 A caveat: be aware of ritualistic use of exploratory methods 241
13.6 Methods related to information provision 242
13.6.1 Written and computer-based search and access facilities 243
13.6.2 Information-needs assessment 243
13.7 Methods related to training 245
13.7.1 Method demonstrations 245
13.7.2 Experiential practicals 245
Questions for discussion 246

14 The management of interactive innovation processes 247
14.1 Some limitations of conventional thinking on participation 248
14.1.1 Defining ‘participation’ 249
14.1.2 Types and levels of participation 250
14.1.3 Is ‘maximum participation’ possible and desirable? 251
14.1.4 Reservations at the theoretical level: strategic versus communicative action 256
14.2 Guidelines for the facilitation of interactive processes 259
14.2.1 Task 1: Preparing the process 259
14.2.2 Task 2: Reaching and maintaining process agreements 263
14.2.3 Task 3: Joint exploration and situation analysis 265
14.2.4 Task 4: Joint fact-finding and uncertainty reduction 270
14.2.5 Task 5: Forging agreement 271
14.2.6 Task 6: Communication of representatives with constituencies 272
14.2.7 Task 7: Co-ordinated action 273
Questions for discussion 274

15 The planning of individual activities 275
15.1 The purpose of an activity 276
15.1.1 Goal hierarchies 276
15.1.2 Communicative and other means or objectives 277
15.2 Stakeholders, audiences, and targeting 279
15.2.1 Characterising relevant diversity 280
15.2.2 Different types of target audiences 285
15.3 Content 285
15.4 Media and methods 287
15.5 Organisation and logistics 288
15.6 Pre-testing elements of activities 289
Questions for discussion 290

PART 5 ORGANISATIONAL AND INTERORGANISATIONAL ISSUES 291

16 Organisational management, learning and research 293
16.1 Co-ordination in organisations: the significance of 'structure' and 'culture' 293
16.2 Images of organisation and the nature of management 295
  16.2.1 Organisations as machines/hard systems thinking 295
  16.2.2 Organisations as organisms/functionalist systems thinking 296
  16.2.3 Organisations as flux and transformation/soft systems thinking 297
  16.2.4 Organisations as political systems/critical systems thinking 298
  16.2.5 Organisations as brains or psychic prisons/cognitive or autopoietic systems thinking 299
  16.2.6 Conclusion: the implications of different images 301
16.3 The importance of (re)formulating missions 301
  16.3.1 Extension in crisis: the need for change and continuity 302
  16.3.2 Organisational implications of a novel mission 303
16.4 The challenge of learning organisations: embracing tension 306
  16.4.1 Looking for and creating tension: some practical hints 308
  16.4.2 Creating opportunities and conducive conditions: practical hints 311
16.5 Organisational research, monitoring and evaluation 314
  16.5.1 Why deviate from the conventional M&E terminology? 316
  16.5.2 Key questions to ask in decision-oriented research 318
Questions for discussion 320

17 Agricultural knowledge and information systems 321
17.1 Knowledge and information systems thinking 321
17.2 Rapid Appraisal of Agricultural Knowledge Systems (RAAKS) 324
17.3 Networking in knowledge systems 326
Questions for discussion 328

18 Privatisation and the emergence of 'knowledge markets' 329
18.1 Economic theory and the commoditisation of knowledge 329
18.2 Public and private forms of financing communicative intervention 332
18.3 Privatisation in research 336
18.4 Initial observations regarding emerging knowledge markets 337
18.5 Reflections on the commoditisation of knowledge 345
Questions for discussion 349

19 Co-operation across scientific disciplines and epistemic communities 350
19.1 Methodological differences between the social and the natural sciences 350
19.2 What does cross-disciplinary co-operation entail? 354
19.3 Obstacles for cross-disciplinary co-operation 356
Questions for discussion 361

PART 6 EPILOGUE **363**

20 Approaches and issues for further conceptual research **365**
20.1 Overall focus: communication and processes of socio-technical design 365
20.2 The role of theory in formulating specific areas and questions for research 366
20.3 A note on research design and methodology: towards 'comparative process ethnography' 373
20.4 Process ethnography as network analysis 375
  20.4.1 Classical network analysis: describing interaction patterns among human actors 376
  20.4.2 Analysing networks of interrelated events 377
  20.4.3 Looking at the building of networks of human and non-human 'agents' 378
  20.4.4 Following knowledge constructs and perceptions in networks 380
  20.4.5 Conclusion 381
Questions for discussion 381

References 382
Index 405

Preface

This book provides a follow-up for Van den Ban and Hawkins' classic *Agricultural Extension* (1988, 1996), of which some 35 000 copies have been printed in 10 languages[1]. It does so in several ways.

First, the book attemps to catch up with recent thinking about the relationship between communication and change. The origins of Van den Ban and Hawkins' book can be traced back to the 1970s, which was the period in which the first (Dutch) edition of the book was compiled (Van den Ban, 1974). Since then, the practice and theory of extension and development communication have changed fundamentally. Although many efforts were made to incorporate new ideas into later editions, we feel that it is now time for a totally new book as we can no longer do justice to the changes in extension thinking by merely adding to or adapting a pre-existing text. In this new book we have maintained and adapted those insights and conceptual models which are still of value today, but at the same time we have incorporated a variety of new ideas, angles and modes of thinking, some of which derive from disciplines that did not feature much in extension discourses of the past. The product of our efforts, we hope, is a book that is ready for the 21st century, and will help to shape and inspire new forms of communicative intervention.

Secondly, the new book provides a follow-up in that it aims at a slightly different audience from the book *Agricultural Extension*. The original book was primarily aimed at practitioners in classical agricultural extension organisations. However, since the 1980s, the landscape of organisations that apply communicative strategies to foster change and development in agriculture and resource management has become much more varied. In this context, we want this new volume to offer inspiration to communication professionals who would never think of themselves as 'extensionists'. Moreover, since the 1980s, a large number of practical handbooks have been published on extension, development communication, participation, etc. (e.g. Blackburn, 1994; Pretty et al., 1995; Swanson et al., 1997). We do not want to repeat what is already widely available. Thus, in this book we tend to discuss methods and methodological issues in the context of wider conceptual debates. We pay relatively more attention to novel (e.g. internet-based) methods and to new ideas regarding the management of interactive processes. In conclusion, this book is aimed in particular at those who function in the higher echelons of public, private and non-governmental organisations that use communication in order to facilitate change in agriculture and resource management. Here we think, for example, of process facilitators, communication division staff, knowledge managers, training officers, consultants, policy makers, change managers and – last but not least – extension (and research!) managers or specialists at district, province and national level. At the same time, the book can be used as an advanced introduction into issues of communicative intervention for BSc or MSc students. Indeed, at our own university the book is used on the international MSc programmes Management of Agro-ecological Knowledge and Social Change (MAKS) and International Development Studies.

---

[1] Of the earlier Dutch and German versions, an additional 30 000 copies were printed. Some translations have been edited instead of being translated literally (e.g. the French book by Van den Ban et al., 1994).

Finally, this book originates from the Communication and Innovation Studies group at Wageningen University, which was founded originally by Van den Ban in 1964 as the Department of Extension Education. Thus, the book fits a particular tradition of thinking about communication and change, a tradition that was started by Professor Van den Ban and later continued by his successors Niels Röling, Cees Van Woerkum and their academic staff. Both successors published introductions to communication and innovation studies (Röling, 1988; Röling et al., 1994; Van Woerkum & Van Meegeren, 1999; Van Woerkum et al., 1999), mostly in Dutch. Therefore, it was felt that it was high time for a new English language overview of our field of study. Clearly, the present book has benefited greatly from the insights and ideas of a range of scholars that work or have worked in and around the Communication and Innovation Studies group, and from the contribution of H.S. Hawkins to the previous book. In that sense, it is very much a collective achievement.

Leeuwis is greatly indebted to Van den Ban for several reasons. Apart from the numerous useful intellectual inputs, Van den Ban also provided the opportunity to write a follow-up book in the first place, and gave Leeuwis the space to make it to a large degree ‘his own thing’.

The CTA

The Technical Centre for Agricultural and Rural Cooperation (CTA) was established in 1983 under the Lomé Convention between the ACP (African, Caribbean and Pacific) Group of States and the European Union Member States. Since 2000, it has operated within the framework of the ACP-EC Cotonou Agreement.

CTA's tasks are to develop and provide services that improve access to information for agricultural and rural development, and to strengthen the capacity of ACP countries to produce, acquire, exchange and utilise information in this area. CTA's programmes are designed to: provide a wide range of information products and services and enhance awareness of relevant information sources; promote the integrated use of appropriate communication channels and intensify contacts and information exchange (particularly intra-ACP); and develop ACP capacity to generate and manage agricultural information and to formulate ICM strategies, including those relevant to science and technology. CTA's work incorporates new developments in methodologies and cross-cutting issues such as gender and social capital.

CTA
Postbus 380
6700 AJ Wageningen
The Netherlands

PART 1
Rethinking extension

In the first four chapters of this book we set out to put into context the concept and societal role of what was previously labelled ‘agricultural extension’. In Chapter 1 we outline the main challenges that agriculture is facing today and the implications this has for communicative intervention practice. This is followed by a discussion of the changing ideas regarding agricultural extension at the conceptual level (Chapter 2). We explain the evolution of the concept of ‘extension’ into the notion of ‘communication for innovation’. The political and ethical dimensions of communication for innovation are discussed in Chapter 3, while two basic approaches to communicative intervention (the instrumental and the interactive approach) are discussed Chapter 4. In the subsequent chapters of this book we will further explore the details and implications of changing views on agricultural extension.

This Page Intentionally Left Blank

1 Introduction

As the problems and challenges faced by agricultural sectors change over time, we will have to adapt our ideas about the role and meaning of 'agricultural extension'. In this introductory chapter we outline some of the challenges that agricultural extension is facing, and point to the need to reinvent agricultural extension as a professional practice. The final section of this chapter provides a more detailed overview of the set-up and contents of the book.

1.1 Challenges for agricultural extension practice

The challenges to agricultural extension in the early 21st century derive, on the one hand, from the challenges that farmers and agriculture face in view of their ever-changing social and natural environment, and, on the other hand, from the changes that emerge within extension organisations themselves in connection with, for example, new funding arrangements, developments in extension theory, and the emergence of new computer-based communication technologies. Different people may have different ideas about what is a challenge for agricultural sectors and/or extension. Thus, the challenges we present are neither complete nor an absolute truth; they are open for debate. Moreover, challenges can often be associated with threats. Our use of the word 'challenge' is deliberate, because we feel it is often more productive to deal with problems and threats in a pro-active way, rather than to run away from them or go into a defensive mode.

1.1.1 Challenges for farmers and agriculture at large

Some of the challenges that face today's agriculture have been with us for a long time, while others have arisen more recently. We will briefly discuss them more or less in order of age.

Food production, food security and intensification

Although the overall world food situation has improved, there are still 800 million people who are chronically undernourished (Zijp, 1998). Improving food security is a challenge which is not simply about producing more food, as many of the causes of food insecurity relate to insufficient *access* to available food, insufficient economic development outside agriculture, bad governance, detrimental trade relations, debt crisis, inadequate functioning of agricultural institutions, etc. (see Koning et al., 2002). Nevertheless, sufficient food production remains an important condition for alleviating food insecurity. Moreover, the demand for food is likely to increase significantly in the near future, as the world population is still growing, and also since higher incomes in many countries result in greater food consumption. Much of the increased food production will have to be realised on land that is already under cultivation, as the availability of new land suitable for agricultural production is limited. Similarly, the scope for expanding irrigated agriculture is constrained due to increased competition for water.

This means that intensification will have to be realised in diverse and risk-prone rain-fed areas, for which available Green Revolution technologies have proved to be largely ill-suited in technical and/or social-organisational terms (Chambers & Gildyal, 1985; Lipton, 1989; Reijntjes et al., 1999). This failure of Green Revolution technologies indicates that agriculture may have to look for routes of 'intensification' other than through the intensive use of external inputs (chemical fertilisers, high yielding varieties, pesticides, machinery, etc.) in mono-cropping systems (Reijntjes et al., 1999). We may, for example, look for forms of 'intensification' that are labour intensive and make use of more complex cropping systems, based on locally adapted knowledge (Van der Ploeg, 1999). It is important, however, to realise that we have learned from the past that no generally applicable agricultural development model exists. What is important is that agricultural systems are flexibly adapted to their environment, and this does not coincide with dogmatic views of what agriculture should look like. In any case, increasing agricultural production through the development and stimulation of technical and/or organisational innovations remains an important concern for agriculture and agricultural extension.

Poverty alleviation, income generation and future prospects

According to estimations by the World Bank (World Bank, 1997; Zijp, 1998) there are some 1000 million economically active people worldwide whose livelihood depends at least in part on subsistence and/or commercial farming. The majority of these have incomes of less than one US dollar a day. For the improvement of their livelihood these people depend directly or indirectly on agricultural development – directly, in the sense that agricultural development may allow them to have a higher income from farming, and indirectly since agricultural development is widely regarded as an important trigger and condition for non-agricultural economic growth (IFAD, 2001; Koning et al., 2002). Contributing to agricultural development, therefore, remains an important challenge. From the perspective of poverty alleviation too, farming that relies on high external input does not seem to be the most feasible development model for many of the rural poor, as it is notoriously difficult for them to acquire necessary inputs.

A problem with many forms of agricultural development is that they usually imply that the same amount of produce can be produced with fewer people, which means that levels of employment in agriculture tend to come under pressure (see also Chapter 3 and Van den Ban, 2002). Where no alternatives exist outside agriculture, greater prosperity for some may mean increased poverty for others. Where prosperity in cities is growing and access to markets in other countries improving (see below), this effect may be ameliorated by possibilities for small farmers to venture into new high value-added and labour intensive agricultural products such as fruit, vegetables, flowers and processed food. However, such products are often more risky than staple food crops, and frequently require specialised knowledge and skills. Moreover, marketing channels are usually not readily available, while international competition can be fierce. Nevertheless, it can be worth exploring and supporting such options, not least to maintain labour and income opportunities in agriculture.

At the same time, it is perhaps significant to note that many of the rural poor see little future in agriculture (Farrington et al., 2002), and would like to see their children get a good education and not become farmers. In some regions agriculture is increasingly looked upon as a ‘last resort’ activity (e.g. Khamis, 1998), i.e. as something one does if everything else fails. With this cultural outlook on agriculture it will be difficult to meet any of the challenges mentioned in this chapter because few may be willing to make a real investment, and many capable people may prefer to leave the sector. Thus, an additional challenge for agricultural sectors may in some cases be to improve its own credibility and image as a promising and valuable economic sector.

Sustainability, ecosystems and natural resource management

Across the world, agriculture has been criticised sharply for its detrimental effects on the natural environment and the world ecology at large. Soil degradation, erosion, water pollution, excessive use of chemicals, waste of water, decreasing ground water tables, destruction of natural habitats for wildlife, and limited animal welfare are just a few of the concerns raised by environmentalists, ecologists, nature conservationists and the public at large. This had led to a call for agriculture to become less exploitative and more ‘sustainable’, which means that agriculture will have to be carried out to make the best use of available natural resources and inputs, and regenerate conditions for future production (e.g. soil fertility, resilience of the ecosystem, water availability). There are different schools of thought on the precise technical, social, economic and ethical criteria and characteristics that should be used to assess and describe the ‘sustainability’ of agriculture. For some, sustainable agriculture means agriculture with low external input, while others argue that this kind of agriculture is unsustainable since it requires a large increase in cultivated area, and that the use of fertilisers and high-tech machinery can also be sustainable. Various labels have been coined, such as integrated agriculture, ecological agriculture, organic agriculture, biological agriculture, permaculture, precision agriculture, etc. Regardless of one’s convictions, sustainable agriculture and natural resource management represent important challenges for primary agriculture, agro-industries and service institutions.

As several authors have pointed out (e.g. Berkes & Folke, 1998; Röling & Wagemakers, 1998) ‘sustainability’ cannot just be looked at in biophysical or ecological terms, because the state of ‘hard systems’ depends crucially on interactions between multiple human beings (i.e. on the ‘soft system’). The hydrological state in a water catchment area, for example, cannot be understood properly in hydrological terms only, i.e. without taking into account the practices of various water users. This is because hydrological processes and their outcomes are shaped and influenced by the way farmers irrigate their land, use stream banks, make wells, plough their land, manage contours, choose crops, etc. This in turn depends partly on wider social–organisational circumstances, such as water laws and regulations, the way markets for different agricultural products are organised, population pressure, the functioning of agricultural service institutions, etc. Thus, when one wishes to improve, from a sustainability point of view, the management of water in a catchment area, one will essentially have to foster new agreements, modes of co-ordination and/or forms of organisation among farmers themselves, and between farmers and other societal stakeholders, including other water users (e.g. industries, urban communities).

The example on water catchment management indicates that the management of natural resources often transcends community and regional boundaries. It is argued by many that some of the environmental problems faced by the world (e.g. climate change, water shortage) can only be solved if co-ordination is achieved on a transnational or even global level. And to further complicate the matter, it is sub-optimal – at least from an ecological perspective – to manage the use of different natural resources (e.g. water, biodiversity, energy, etc.) separately, because ecological cycles are closely intertwined. Even if local or regional stakeholders in agriculture are often not in the position to foster co-ordination at such a scale and level of complexity, global ecological issues may well have local and regional implications for farmers and others if one accepts the motto 'think globally, act locally'.

At the local level, then, an additional challenge is posed by the experience that sustainable agriculture requires different types of agricultural knowledge from that previously developed by research institutes and disseminated by extension organisations (Röling & Van de Fliert, 1994; Röling & Jiggins, 1998). When we limit ourselves to 'agro-technical' knowledge, three issues arise. Although there may be disagreement over the precise meaning of the term 'sustainable', it is self-evident that such types of agriculture require farmers to manage and co-ordinate ecological processes and cycles carefully. In crop-protection, for example, it is no longer sufficient merely to apply a number of preventive sprayings according to a standard recipe. Instead, a balance must be maintained between pests and their natural predators, and keeping the ecosystems in which the latter exist. The management of this kind of balance requires that farmers have a good insight into complex ecological processes and interconnections, and at the same time that they can anticipate the inherent unpredictability of such systems (Holling, 1985, 1995).

A second feature that seems to be important is that, especially with low external input, sustainable agrarian practices will probably need to be more varied than conventional practices. The crop rotations of biological farmers, for example, involve a greater number of crops, and a certain amount of integration with stock grazing would seem an obvious step. This relative 'de-specialisation' means that farmers need to be conversant with a broad spectrum of knowledge. Lastly, ecological processes and situations are by nature locally specific since important differences can exist within individual regions or even individual fields. Awareness of the local situation is therefore essential. In short, the nature of the requisite knowledge could be described as *complex*, *diverse* and *local*. Much of this knowledge is not readily available and needs to be developed and/or adapted 'on the spot' with close co-operation between farmers, researchers and extensionists.

In summary, it can be argued that, if agricultural branches are to become more sustainable, farmers and other stakeholders will – more than in the past – have to take into account and link inherently complex knowledge regarding both *global* and *local* processes and circumstances. The emergence of new practices and forms of co-ordination depends in essence on joint learning and negotiation between stakeholders (Daniels & Walker, 1996). As discussed in section 1.1.2, this may require different forms of extension practice from the modes of operation we have seen in the past.

Globalisation and market liberalisation

Due to huge changes in communication and transport technologies, the exchange of goods, people and ideas has become much easier and more widespread than before. Even the most remote rural areas often have numerous direct or indirect connections with the wider world economy. Moreover, under the influence of World Trade Organisation (WTO) agreements, and World Bank and International Monetary Fund (IMF) policies, as well as national policies, this world economy becomes increasingly organised according to the principles of the 'free market'. Many economists regard the free market as the most efficient means to allocate scarce resources. And even where – according to neo-classical economic theory itself – the conditions for such a market to operate effectively are not provided (e.g. perfect competition and perfect information), we witness attempts being made to create a free market and/or to create appropriate conditions for it. Although one can legitimately question the effectiveness, morality, political implications and cultural connotations of the current free market ideology, we cannot ignore the consequences for agriculture, especially non-subsistence. The emerging world market provides both constraints and opportunities for agriculture. The gradual removal of trade barriers and agricultural protection systems may allow producers in, for example, Africa to venture into new products (e.g. flowers, labour-intensive crops) that can be exported to industrialised countries, but it may also effectively wipe out agricultural branches (e.g. maize or milk production for local markets) where products can be imported more cheaply.

In connection with this, it is worrying that huge differences exist in labour productivity between industrialised and non-industrialised countries, and that these differences are increasing rather than decreasing. According to the World Bank (2000), many industrialised countries have a labour productivity in agriculture that is 50 to 100 times higher than non-industrialised countries. Of course, there are also enormous differences in costs (e.g. in terms of land, equipment, inputs, etc.), and the quality of the World Bank data may well be contested, but the threat is real that important agricultural products may increasingly be produced more cheaply in industrialised countries. In addition, these countries spend over 70 times as much on income support for their own farmers than on development assistance (IFAD, 2001). This restricts the opportunities for non-industrialised countries to export their agricultural products. In this regard, market liberalisation is rhetoric, not reality. Where and when market liberalisation progresses, regions will have to increasingly adapt their market-oriented agricultural systems according to their competitive potential vis-à-vis other regions of the world. This implies that there is an increased need to use and collect information on opportunities and consumer demands elsewhere in the world, and on the developments that take place in competing regions. If, alternatively, regions wish to escape from the pressures of the world market, they will have to deliberately maintain and/or establish protection and/or non-market arrangements (e.g. in the form of contracts, family or tribal networks, joint ventures, etc.) between agricultural producers, processing companies and consumers. This too provides important challenges, as it tends to run counter to the dominant economic regime. In any case, as farmers are often relatively weakly represented in debates on world market arrangements, a final challenge here may be to stimulate and strengthen new forms of farmer organisation at various levels (local, national and international) in order to have a greater leverage vis-à-vis other market parties.

Multi-functional agriculture

In connection with the societal debates on environmental issues and sustainability, it has been realised that agriculture has, or can have, many more functions than producing food and non-food plant or animal products. Farmers may or may not 'produce' clean air, a beautiful landscape, biodiversity, attractive space for recreation, clean water, a healthy soil, animal welfare. In other words, there can be many things that farmers 'produce' for which they are not directly rewarded in financial terms. Of course, it is in the interest of farmers themselves to maintain a healthy soil and clean water, and several governments have introduced laws and licensing systems to prevent environmental degradation. Thus, some of these 'products' can be regarded as something that farmers need to deliver 'free of charge'. However, when farmers are functioning in a liberalised world market, it cannot be taken for granted that they preserve the landscape, maintain recreational spaces and improve animal welfare if their immediate competitors elsewhere in the world are not required to take such often production-limiting measures as well. Mainly in rich industrial societies where citizens would like farmers to maintain such landscape, recreational and/or natural values, we see the introduction of new arrangements (e.g. a nature conservation contract, certified value-added marketing chains for 'nature friendly' food) through which farmers can be rewarded financially for the provision of non-agricultural functions. Even apart from an ecological merit, such reward systems for 'multi-functional agriculture' are in some countries rapidly becoming an economic prerequisite for the survival of the agricultural sector.

The Netherlands, for example, is a small and densely populated country, in which space, nature and land are extremely scarce. Although agriculture, in the narrow sense, is technically advanced and highly productive, it is increasingly becoming non-viable since the costs for acquiring or even inheriting land and production rights are much higher than in nearby surrounding countries (e.g. Eastern Europe), while the same is true for variable costs such as labour. Thus, in order to make agriculture survive, government bodies and farmers are looking for new value-added products, including non-agricultural ones such as recreational services, nature conservation and even agro-health care services. Hence, developing suitable arrangements for multi-functional agriculture is a challenge that an increasing number of regions in the world will have to face in view of ecological and/or economic pressures. This challenge includes the need for the agricultural sector to establish effective communication and co-operation with other actors in society, such as one-issue action groups and non-agricultural sectors. As we have learned in the Netherlands this is not always easy, as some of these parties have come to look upon each other as 'enemies' with competing interests in a 'struggle' over land-use (e.g. Aarts & Van Woerkum, 1999).

Agrarian reform

In different parts of the world we witness different types of agrarian reform. In many industrialised countries farm sizes have steadily increased while the numbers of farms has dropped significantly. This trend was facilitated by technological developments and agro-economic policies, and seems to continue in view of market liberalisation and efforts to reduce over-production. In the former communist countries of Eastern Europe very large co-operative and state farms are being divided into smaller landholdings, with former workers becoming farm managers. In parts of Southern Africa too large commercial farms are being redistributed into smaller farms for people with insufficient land, or new ownership arrangements are being forged between large scale commercial farmers and former employees. Each of these situations has its own history, and produces specific problems. In the Netherlands, for example, many retrenching farmers have emotional problems in giving up farming, while in both Russia and Southern Africa it is difficult to establish adequate agricultural infrastructures for redistributed farms. Moreover, Russian officials complain that farmers find it difficult to take up the culture of enterpreneurship, while in Southern Africa it often proves difficult to overcome animosity between different racial communities. Although the challenges posed by policy-induced changes in the agrarian structure vary across regions, it is important that they are tackled.

Food safety and chain management

Increasingly, urban consumers of food products are concerned about the safety of the food they consume. The shops and markets in our globalising economy can be full of vegetables, processed food and meat that were produced in far-away places. Similarly, the feed and fodder on which animals were raised before being slaughtered can originate from across the world. In recent decades we have witnessed several food scares, when more and less serious problems emerged with food. Cattle in Europe were given feed compounds that contained bone material from diseased sheep, and developed a dangerous disease called BSE which may be transferred to human beings when they eat certain parts of infected animals. Similarly, contaminated oils and fats were fed to chickens or added to olive oil, which caused health hazards. Other horror stories revolve around illegal use of growth hormones for meat production, and residues of pesticides and other toxic components in vegetables and milk products. Similarly, many consumers, rightly or wrongly, worry about the consequences of consuming food that has been prepared on the basis of genetically modified organisms. In view of such experiences, a significant number of consumers have lost trust in food production chains. Basically, they fear that anonymous primary producers, food processers, animal feed industries, etc. may be more concerned with earning money than with the health of consumers (and/or other values they care about, such as animal welfare, the environment, etc.). Consumer organisations and large retailers call for better guarantees and transparency in food production chains. This is often put into effect by 'integrated chain management'. This basically means that all major steps and transactions in the food production chain are monitored and made traceable, so that if, for example, a contamination problem is discovered, its origin can be analysed, as well as who is responsible, and where other contaminated food products or raw materials may be found. The establishment of effective control systems is far from easy, and will still take considerable time. However, even today many large retailers and food processing companies are only willing to buy primary agricultural products when farmers can give guarantees concerning the production methods and inputs used. Meeting such increasingly stringent criteria is a challenge for farmers and the agricultural sector as a whole.

Knowledge intensity, knowledge society and commoditisation of knowledge

Many of the challenges mentioned above can only be tackled if the agricultural sector develops and uses more sophisticated and better adapted knowledge and information (e.g. on localised agro-ecological processes, market developments, risks, etc.). This derives in part from the nature of the required innovations (intensification in fragile rain-fed areas, sustainability, keeping in tune with the world market, etc.), but also from a more general development in society whereby knowledge becomes an increasingly significant economic production and growth factor (World Bank, 1998; FAO & World Bank, 2000; Little et al., 2002). The basic idea is that the competitive advantage of companies and sectors increasingly depends on the quality and timely use of the knowledge and ideas of those who work in it, rather than on, for example, the relative advantages with regard to labour costs. The Dutch glasshouse horticultural sector is an example. When compared to, for example, Southern Europe or sub-tropical areas, the sector is characterised by very high energy costs (heating systems), high investments (glasshouses), and high labour costs. Despite these disadvantages the sector has so far remained competitive internationally, mainly because growers invest a lot in the generation, mutual exchange and application of new insights.

According to the World Bank (1998), knowledge production in society is accelerating, while at the same time the accessibility of such knowledge tends to improve in view of rapid developments in information and communication technologies (i.e. the internet), at least for those who are 'connected' and have sufficient resources. This latter reservation on the issue of access is an important one, especially since, in view of its economic importance and potential, applied knowledge is more and more regarded as a marketable product for which a price needs to be paid. This is a development which does not only affect farmers (who increasingly have to pay for extension services), but all parties in the knowledge network. Free exchange of knowledge and information between (and even within) fundamental research, applied research, extension and farmers becomes less and less self-evident. For agricultural sectors across the world it is a challenge to keep in touch with, contribute to, and/or catch up with the rapid developments in knowledge, science and technology. It has to be achieved in circumstances where access to relevant knowledge becomes easier from a technological point of view, but perhaps more difficult in financial terms.

1.1.2 Reinventing extension

When challenges change, the organisations which are supposed to support farmers in dealing with them will have to change as well. Besides, there are internal challenges that extension organisations will have to meet if they wish to play a role in the future. Taken together, it can be argued that agricultural extension will have to be reinvented as a professional practice; that is, it will have to significantly adapt its mission, rationale, mode of operation, management and organisational structure (see Chapter 16). This will have to be accompanied by conceptual changes regarding agricultural extension; these are discussed in Chapter 2 and subsequent chapters. Below, we indicate briefly some of the practical changes that may be required; they too will be discussed in more detail in other parts of the book.

Dealing with collective issues

In the past, extension and extension theory have focused on supporting individual farm management, and on the promotion of farm-level innovations. However, when we look at the challenges of today, many of these transcend the level of individual farms or farm households. Issues like the management of collective natural resources, chain management, collective input supply and marketing, organisation building, multi-functional agriculture and venturing into new markets typically require new forms of *co-ordinated action* and *co-operation* among farmers, and between farmers and other stakeholders. In addition, we have learned from the past that the successful application of most farm-level innovations is also often dependent on factors that transcend the farm level (e.g. input supply, marketing, community support, transport, processing). In other words, many innovations have been mistakenly looked at as being individual in nature. The conclusion that most of the innovations needed in present day agriculture have collective dimensions (i.e. they require new forms of interaction, organisation and agreement between multiple actors) has important implications for extension practice and extension theory. In the past, much of the thinking about extension has, for example, revolved around individual decision-making and adoption processes (see Chapter 8). Clearly, a greater emphasis on collective processes would require that we pay more attention to issues like dealing with diverging interests, different actor perspectives, and conflicts, and hence shift our attention to processes like conflict resolution, organisation building, social learning and negotiation. This shift in emphasis requires us to rethink what extension is all about, and what type of people and organisations we need for it.

Co-designing rather than disseminating innovations

The tendency among extension organisations to promote indiscriminately badly adapted and pre-defined innovations, many of which were developed by researchers with little understanding of farmers' problems and priorities, has been documented and criticised widely (Van der Ploeg, 1987; Röling, 1988; Leeuwis, 1989; Van Veldhuizen et al., 1997). In view of the challenges presented in the previous section, the idea of selling pre-defined packages becomes perhaps even less appropriate.

No simple and ready-made solutions exist for the intensification of rain-fed agriculture under highly diverse social and natural conditions. Similarly, sustainable agriculture typically requires relatively complex solutions that are carefully adapted to *local* agro-ecological and social conditions, and hence must be tailor-made. Moreover, no blueprints exist for the types of collective innovations described in the previous paragraph; such innovations can only grow and emerge out of the interactions between various stakeholders.

All this implies that extension needs to play a more active role in *processes of innovation design and adaptation*. Such a role may, for example, entail the shaping, organisation and facilitation of innovation processes (i.e. process management), and/or the making of 'translations' between farmers' and external researchers' views and concerns. Of course, whenever promising locally adapted innovations have emerged, extension staff may consider how these may get a wider application without having to repeat the innovation process from point zero. However, experience has shown that locally developed innovations and knowledge cannot be transferred through conventional transfer of technology approaches (see Röling & Van de Fliert, 1994; Van Schoubroeck, 1999). Rather, the 'scaling-up' of tailor-made innovations to different contexts and people will always have to include elements of redesign, encompassing new processes of learning and negotiation, and hence should not be looked at merely as 'dissemination'. Clearly, playing a role in innovation design and process management towards innovation would mark a break-away from traditional forms of extension.

Matching the technical and social dimensions of an innovation

In order to contribute to innovation processes, it is important that extension organisations have a clear idea of what exactly constitutes an 'innovation' and what kind of process is needed to arrive at it. Many scientists regard an 'innovation' as a new technical product or procedure that is created in a research facility; in line with this, innovation processes are primarily associated with 'doing research'. However, it is well known that many of the new ideas, products and processes developed in laboratories and the like never reach the stage of being applied in everyday practice (Little et al., 2002). For purposes of extension, therefore, we need a more pragmatic conception of an 'innovation'. Following Roep (2000), we propose to define an innovation more pragmatically, in terms of its successful application. From this perspective, then, an innovation needs to be understood as a 'novel working whole' (Roep refers to a 'reordered working whole'). In other words, it may be 'a new way of doing things' or even 'doing new things', but it can only be considered an innovation *if it actually works* in everyday practice. Looking at an innovation in this way helps us to understand that an innovation is not only composed of novel technical devices or procedures, but also of new or adapted human practices, including the conditions for such practices to happen.

A good example is provided by Van Schoubroeck (1999) who describes how scientists and farmers discovered that the Chinese citrus fly in Bhutan could in principle be combated by means of splashing poisonous bait into mandarin tree canopies, rather than spraying huge amounts of pesticide. However, the adequate functioning of this technique required that communities developed a range of social–organisational arrangements. These included the design and application of monitoring routines to determine the timing of bait splashings, procedural arrangements for the collective preparation of bait and the sharing of costs, and organisational arrangements to ensure that all community fields were treated at the same time. Strikingly, different communities of mandarin growers had varying capabilities to organise themselves to this end, and hence required different technical devices to combat the Chinese citrus fly. This example shows that we can only speak of a complete innovation if there exists an appropriate mix and balance between new *technical* devices and novel *social–organisational* arrangements. Thus, innovations have a technical and a social dimension, and contributing to innovation means that one needs to work on both dimensions simultaneously. Furthermore, the example indicates once more that innovations have a collective dimension in that they require co-ordinated action between different actors. Hence, apart from 'doing (joint) research', working on innovation has a lot to do with *creating support networks* and negotiating new arrangements between various stakeholders. As indicated earlier, this may require new tasks, skills and activities by extension organisations.

Catering for diverse farming and livelihood strategies

For a long time economists as well as extensionists have assumed, implicitly or explicitly, that agricultural development is something that progresses in one particular direction (e.g. towards high input, high output, high-tech farming). The idea was that given certain conditions there is basically *one* optimal way of managing a farm. Much used categorisations of farmers such as 'vanguard farms', 'followers', 'early adopters', 'late adopters' and 'laggards' (Rogers, 1983) reflect this idea, namely that everybody is (or should be) moving in the same direction, even if some may do so more quickly than others. In recent years, many studies have indicated that this idea is flawed. It transpires that farms that are initially characterised by comparable layouts and household composition, and which operate under very similar conditions, can still develop along different, economically viable paths (Bolhuis & Van der Ploeg, 1985; Leeuwis, 1989, 1993; Van der Ploeg, 1990). Key factors in explaining such different patterns of farm development are the diverse strategies and aspirations that farmers may have regarding their social and natural environment, as well as variations in the way they organise their livelihoods and in the role agriculture plays with respect to non-agricultural activities[1]. Some farmers may, for example, prefer to organise their farms relatively autonomously (i.e. independent from input markets), while others do not mind buying in external inputs. Similarly, some enterpreneurial farmers like to operate on a large scale resulting in bulk production, while others capitalise on their craftsmanship and engage in smaller scale, quality production.

When implemented properly, different strategies may yield positive results. In the past, this kind of diversity has often not been properly valued by extensionists, who regularly preferred one particular model of farm development (Leeuwis, 1989; Roep et al., 1991). A study in Ireland, for example, showed that extensionists regarded farmers who did not develop along the lines proposed by the extension organisation as backward and stagnant, while closer investigation reveiled that these ‘laggard’ farmers had adopted similar numbers of innovations – albeit different ones – when compared with those who followed extension advice (Leeuwis, 1989). Rather than being ‘less innovative’ or ‘stagnant’ they showed a *different* dynamism, which was not recognised (and perhaps deliberately ignored) by extensionists. More than in the past, extension organisations will have to anticipate diversity among farmers, which means that they have to be able to give different advice to different people, and treat diversity as a resource rather than as a burden.

---

[1] Many studies on livelihood strategies show that a substantial part of the income generated by rural households stems from non-agricultural sources (Hebinck & Ruben, 1998; Ellis, 2000; IFAD, 2001).

Managing complexity, conflict and unpredictability

In the past, extension and other development oriented organisations have often looked at change and innovation as something that could and should be *planned* (e.g. Havelock, 1973). The idea was – and for many still is – that it makes sense to formulate goals in advance, and that it is possible to then organise a rational process that eventually results in achieving the desired outcomes. Implicit in such conceptions is the assumption that people and developments in society can in principle be predicted and steered, if only there is adequate knowledge about the causes and effects of societal problems. In line with this, a similar trust existed in the predictability and controllability of technical and natural processes. Typically, many styles and methods for project-planning reflect this kind of control-oriented thinking. However, in recent decades we have learned that human beings often act in unexpected ways and that interactions between people have a dynamic of their own which cannot be predicted. Moreover, human actions and interventions may well have unintended consequences, and one often has to deal with unanticipated developments outside interventions.

In a similar vein, technical and agro-ecological processes do not always ‘behave’ in expected ways, and at the point where the social and the technical meet, many unforeseen developments may take place (Holling, 1995). Not surprisingly then, many projects have never realised their original objectives. It has been shown that projects were hampered by the fact that fixed objectives, activities and budget allocations were formulated in advance, which made it difficult to incorporate later developments, insights and priorities (Leeuwis, 1993). Moreover, it is striking that when one analyses the history of positive developments and innovations, one often finds that these have not resulted from formal planning. Rather, ‘unplannable’ phenomena like accidental discoveries, coincidence, informal networking, creativity, enthusiasm and ‘personal chemistry’ played a major role. In all, we have come to think of change and innovation as inherently messy, chaotic, complex and unpredictable; in other words, as quite incompatible with the idea of planning. Often, part of this messiness is connected with tensions and conflicts between people that tend to emerge whenever meaningful changes are considered; after all, there are always vested interests and values at stake in such a process. The challenge for extension and other development organisations, then, is to organise their interventions in a much more adaptive and flexible way, so that learning experiences and emergent developments can be incorporated in ongoing activities. This may require new forms of monitoring, evaluation and securing accountability in connection with development efforts.

Becoming learning organisations

From the perspective of organisation theory (e.g. Mintzberg, 1979), the survival of organisations depends eventually on whether or not they can adapt to changing circumstances. When we look around, we see that our society and agro-ecological environment is changing continuously, and according to some the pace of change becomes more and more rapid in view of the development of ‘knowledge society’. This would imply that, in order to survive, organisations have to change and adapt more or less permanently, and in a way that is consistent with changing characteristics and ‘demands’ of the environment. If organisations do not reflect critically on their mission, services, products, culture, procedures, etc. on a regular basis, they may well become dysfunctional and go bankrupt or be abolished.

In order to adapt, it has been argued that organisations must become ‘learning organisations’ (Senge, 1993; Van den Ban, 1997; Easterby-Smith et al., 1999). This essentially means that, within and between hierarchical levels in the organisation, the members of the organisation need to share both positive and negative experiences (i.e. successes, mistakes and problems) and learn from them. This sounds quite simple and straightforward, but it is not. In practice, it appears that organisations often choose to ignore and avoid threatening developments in the environment, that there is little institutional space for critical thinking, and that problems and mistakes are hidden away from other people or organisational levels. Often, rewards systems in organisations do not encourage employees to be critical and open about their failures, while it may well be that such failures carry the seeds for future successes. Moreover, especially in formal and hierarchical bureaucracies – which extension organisations frequently are – communication often takes place from top to bottom rather than the other way round. Consequently, the higher levels in the organisation may have very little knowledge of the real activities, problems and concerns of their frontline workers, which considerably reduces the chance that they take appropriate management decisions (Wagemans, 1987). Given the challenges ahead, and the continuous changes that extension organisations face, it will be imperative for many extension organisations to improve their capacity and mechanisms for learning.

Being brokers in an era of participation

Particularly when funded by donors or government agencies, extension workers and change agents often find themselves in a broker position; that is, they are placed in the difficult position of having to marry, and/or mediate between, different interests. On the one hand, they are paid by the government or a donor, which typically is interested in stimulating a particular type of development, change or innovation (e.g. increasing cash crop production or strengthening the position of women in agriculture), and they have to somehow show to such funding agencies that they are doing a good job. On the other hand, they have to work and maintain credibility with their immediate clients (e.g. farmers), who may have totally different priorities from funding agencies and hence expect support from extension workers in altogether different areas. The extension agents, then, are squeezed in the middle. On certain occasions (e.g. when reporting), they will have to frame or translate the things they do into the discourse, terminology and criteria of those who fund them, whereas in other contexts they have to link in to the language and aspirations of farmers. This 'juggling with discourses' (Hilhorst, 2000) requires considerable creativity and skill. One might expect that this tension could be somewhat ameliorated by the fact that many donors and governments nowadays advocate decentralisation and participatory approaches, which would in theory grant primacy to the priorities and criteria of clients. However, in practice funding agencies often limit the boundaries within which people can participate (Craig & Porter, 1997; Zuñiga Valerin, 1998; Amankwah, 2000; Pijnenburg, 2003); that is, they still have fairly explicit ideas as to what should be the outcomes of the participatory process.

Here we touch on a general 'participation paradox'; on the one hand participatory approaches start from the idea that people are capable, knowledgeable and active, while on the other hand participatory projects are, at least to a degree, outside interventions which build on the assumption that 'something specific is missing', which in turn comes close to 'people cannot do it themselves'. In addition, funding agencies and clients may have rather different ideas concerning the meaning of 'participation' itself. To donors and funding agencies 'participation' may mean 'empowerment' or 'handing over responsibility to people', while citizens may interpret it as 'getting paid for work done' or as 'government laziness and avoidance of responsibility'. In any case, it is clear that – despite all the rhetoric and good intentions – participatory trajectories are often far from smooth, and quite often produce disappointing results for those that initiate or participate in them (Eyben & Ladbury, 1995; Leeuwis, 1995; Mosse, 1995; Wagemans & Boerma, 1998; Brown et al., 2002; Pijnenburg, 2003). Thus, there is still a need to further clarify what exactly participation means in an intervention context, what the role of extensionists can be in participatory processes, and what institutional and funding arrangements may be helpful in ameliorating some of the tensions that practitioners face.

Coping with dwindling resources

Many public extension services across the world face dwindling resources. The reasons for this differ. In some cases, governments are more or less forced to cut budgets in view of structural adjustment policies or economic crisis. Elsewhere, extension organisations have not been able to show convincingly to governments and/or donors that they deliver value for money. And in industrialised countries especially, governments feel that farmers should and can pay for extension services themselves (Van den Ban, 2000). A typical response to limited resources is inertia, and blaming the government. Understandable as this may be, such responses do not solve anything. Therefore, one of the challenges that extension organisations face is to devise innovative ways both of working with limited resources and of accessing new sources of income. Some basic modes of doing this are well known, including various cost recovery strategies, co-operation with non-governmental organisations (NGOs), supporting farmer to farmer extension, and/or total privatisation of the