

Challenges and perspectives  
for the World Summit on  
Sustainable Development  
Johannesburg 2002

# LAND AND AGRICULTURE

From UNCED, Rio de Janeiro 1992 to WSSD, Johannesburg 2002



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In recent decades, a wide variety of doomsday stories have repeatedly documented the growing role of agricultural systems in the degradation and depletion of natural resources, the pollution of the environment and the contamination of food products. These alarming trends and the multiplication of droughts, pest and disease outbreaks and food shortages and famines, seemed to cast doubt on the feasibility of providing sufficient, reliable and safe food supplies to an ever-increasing world population. In addressing these problems in Rio de Janeiro, the UN Conference on Environment and Development adopted in 1992 a series of measures for action in three important areas: sustainable agriculture and rural development (SARD), combating desertification and drought, and integrated planning and management of land resources.

Ten years later, the UN Commission on Sustainable Development (CSD) decided to review progress in these three closely related areas as part of one single cluster “land and agriculture”. It underlined the importance of the commitment taken by the World Food Summit in Rome to half the number of undernourished by 2015 (nearly 800 million people at present). The CSD pointed to the urgency and the difficulty of this challenge particularly in the face of a shrinking land resource base for agriculture arising from competition for land and water resources and multiple degradation and depletion processes and in the wake of multilateral negotiations on agricultural trade. The member governments of the CSD therefore requested more concrete evidence that progress in these three areas was not only feasible but also actually occurring. To this end, it requested that success stories illustrating positive developments in the land and agriculture cluster be collected and compiled in a compendium which could serve as examples and indicate further directions for action.

There is great diversity in agricultural and rural systems throughout the world. Thus the adoption of common criteria and indicators for a worldwide selection of successful cases represented a significant challenge and could have gone against the basic values attached to this diversity. A further difficulty is represented by the problems of the scale and the time frame for measuring progress towards sustainability. Such progress was assessed jointly on the three fronts of sustainable development: economic, social and environmental. Moreover a balance was sought among the cases presented (for example, many cases of successful agriculture practices were available whereas only few cases of integrated SARD policy were obtained). The selection was, therefore, made on the basis of a consensus of experts and local stakeholders relying on their experience and judgment.

The resulting mosaic of successful cases collected is heterogeneous and so shows that there is no simple panacea, but rather a wide range of possible initiatives and contributions to the attainment of SARD and sustainable land resource management. Most are addressing a specific situation or problem encountered. In order to facilitate their review and assessment, a framework of basic questions and areas of intervention was developed within which the cases were sorted according to their main thrust. The emerging picture shows the many areas where some promising progress is being made. This compendium is not, however, an exhaustive account of all the positive results achieved at various levels in the implementation of the Rio agreements in the agricultural and rural sectors.

The optimism which might come out of the “success stories” presented here should not conceal the existing shortcomings and gaps and the immensity and difficulty of the tasks ahead of us in achieving the objectives of SARD and sustainable management of our land resources. The compendium draws attention to the trade-offs and secondary problems which result in successes in one area or for only some segments of the population. There is no room for complacency. This was confirmed by the review recently made of the progress achieved five years after the World Food Summit, which showed that, at the present pace, the reduction by half of the number of undernourished in the world by 2015 will not be attained, unless a much stronger political will emerges to reduce food insecurity.



The challenge is likely to become even harder as the agricultural and rural sectors are particularly vulnerable to the ongoing global changes such as those created by the globalisation of trade, the introduction of new technologies, and the anthropogenic modification of climatic conditions. Nevertheless the basic premises underlying the strategies of SARD and of integrated management of our land resources remain as valid today as when they were enunciated in the Agenda 21 adopted by governments in Rio ten years ago. The sustainable development of the agricultural sector should go hand-in-hand with broader development and investment efforts in rural areas, with the steady improvement of the rural livelihoods, the achievement of a better food security and food safety for consumers, and a more rational and equitable utilization and conservation of our limited land resources for present and future generations.

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<b>CARDER</b>	Centre d'Action Regional pour le Developpement Rural
<b>CIAL</b>	Local Agricultural Research Committees
<b>C-MAD</b>	Community Mobilization against Desertification Programme
<b>EPAGRI</b>	Empresa de Pesquisa Agropecuária e Difusão de Tecnologia de Santa Catarina
<b>FFS</b>	Farmer Field School
<b>FUL</b>	Förderprogram Unweltschonende Landbewirtschaftung
<b>GAO</b>	Grupo de Agricultura Organica
<b>GoR</b>	Government of Rajasthan
<b>GTZ</b>	Deutsche Gesellschaft für Technische Zusammenarbeit
<b>HEKUL</b>	Hessisches Kulturlandschaftsprogramm
<b>IACR</b>	Institute of Arable Crops Research
<b>ICIPE</b>	International Centre of Insect Physiology and Ecology
<b>ICLARM</b>	The International Centre for Living Aquatic Resources Management
<b>ICRAF</b>	International Centre for Research in Agroforestry
<b>IFAD</b>	International Fund for Agricultural Development
<b>IPGRI</b>	International Plant Genetic Resources Institute
<b>IRRI</b>	International Rice Research Institute
<b>ISMAM</b>	Indígenas de la Sierra Madre de Motozintla
<b>KfW</b>	Kreditanstalt für Wiederaufbau
<b>MEKA</b>	Marketentlastungs und Kulturlandschaftsausgleichscheme of Baden-Württemberg
<b>NABARD</b>	National Bank for Agriculture and Rural Development
<b>NGO</b>	Non-Governmental Organization
<b>PIM</b>	Participatory Irrigation Management
<b>RTC</b>	Rural Training Centre
<b>SARD</b>	Sustainable Agriculture and Rural Development
<b>SIDA</b>	Swedish International Development Agency
<b>WUA</b>	Water Users Association

## RATIONALE FOR A COMPENDIUM OF RECENT SUSTAINABLE DEVELOPMENT INITIATIVES IN THE FIELD OF AGRICULTURE AND LAND MANAGEMENT

While there has been considerable progress in increasing food production and understanding natural resource management since the United Nations Conference on Environment and Development (UNCED, 1992), severe problems of food insecurity, poverty and environmental degradation still persist.

Over the past 40 years, per capita world food production has grown by 25 percent, and food prices in real terms have fallen by 40 percent. As a measure of this growth, average cereal yields grew from 1.2 t/ha to 2.52 t/ha in developing countries between the early 1960s and late 1990s, whilst total cereal production has grown from 420 to 1 176 million tonnes per year. Yet the world still faces a fundamental food security challenge. Despite steadily falling fertility rates and family sizes, the world population is expected to grow to 8.9 billion by 2050. By this time, 84 percent of people will be in those countries currently making up the ‘developing’ world.

At the year 2000, there were 790 million people hungry. Despite progress on average per capita consumption of food (up 17 percent in the past 30 years to 2 760 kcal), people in 33 countries still consume under 2 200 kcal per day. Although a combination of increased production and more imports will mean per capita consumption will increase to about 3 000 kcal per day by 2015, food insecurity and malnutrition is expected still to persist. Food demand will both grow and shift in the coming decades for three reasons:

- ❖ increasing numbers of people (until at least the mid to late twenty-first century) mean the absolute demand for food will increase;
- ❖ increasing incomes mean people will have more purchasing power (even though many will remain on no more than US\$1/day);
- ❖ increasing urbanization means people will be more likely to adopt new diets, particularly consuming more meat – demand is expected to double by 2020 in developing countries, and increase by 25 percent in industrialized countries, helping to drive a total and per capita increase in demand for cereals (it takes 7 kg of feed to produce 1 kg of feedlot beef, 4 kg for 1 kg of pork, and 2 kg for 1 kg of poultry).

The 55th Session of the General Assembly in its resolution 55/199 of 20 December 2000 has decided to organize the review of progress in the implementation of Agenda 21 and other outcomes of UNCED at summit level. The Summit is held in the summer of 2002 in Johannesburg, South Africa, and is called the World Summit on Sustainable Development. This compendium of cases of improved land management and sustainable agriculture and rural development (SARD) has been developed as a supporting document for the Task Manager’s Report to CSD+10 on the land and agriculture cluster for chapters 10, 12 and 14 of Agenda 21.

This report draws together 75 cases illustrating the many features of UNCED, Agenda 21 implementation. These are drawn from 45 countries. These are intended to provide important supporting evidence to answer five key questions for decision-makers:

- ❖ What technical innovations are leading to improvements in food production with SARD?
- ❖ What novel institutional partnerships and joint working arrangements have been developed for the implementation of Agenda 21 in the agriculture sector?
- ❖ What examples of enabling policies have been implemented by governments to support sustainable land management and SARD?
- ❖ What rural development outcomes have occurred with successful implementation of SARD?
- ❖ What wider environmental outcomes have been achieved with successful implementation of Agenda 21?

These 5 key areas are divided into a total of 20 secondary subsections.

## KEY CONCEPTUAL ISSUES

Recent years have seen significant convergence in both concepts and implementation themes for SARD. These illustrate a growing understanding of the nature of sustainable agriculture, its links to rural development, and the increased involvement of a wide range of institutions in implementation. These include public and private, government and non-government, and local, national and international.

What then do we understand by sustainable agriculture? In the first instance, a more sustainable food production system seeks to make the best use of nature's goods and services whilst not damaging the environment (for a list of key references, see bibliography at the end of report). SARD does this by integrating natural processes such as nutrient cycling, nitrogen fixation, soil regeneration and natural enemies of pests into food production processes.

It also minimizes the use of non-renewable inputs (pesticides and fertilizers) that damage the environment or harm the health of farmers and consumers. It makes better use of the knowledge and skills of farmers, so improving their self-reliance. And it seeks to make productive use of people's capacities to work together to solve common management problems, such as pest, watershed, irrigation, forest and credit management (now commonly termed as social capital).

SARD jointly produces food and other goods for farm families and markets, and also contributes to a range of public goods, such as clean water, wildlife, carbon sequestration in soils, flood protection, landscape quality. It delivers many unique non-food functions that cannot be produced by other sectors (e.g. on-farm biodiversity, groundwater recharge, urban to rural migration, social cohesion). SARD is therefore multipurpose, having many positive externalities (or side effects), whilst reducing negative externalities to a minimum.

Sustainable agriculture comprises agricultural technologies and practices that maximize the productivity of the land whilst seeking to minimize damage both to valued natural assets (soils, water, air, and biodiversity) and to human health (farmers and other rural people, and consumers). It focuses upon regenerative and resource-conserving technologies, and aims to minimize the use of harmful non-renewable and fossil fuel derived inputs.

As it seeks to make the best use of nature's goods and services, so the technologies and practices must be locally adapted. These emerge from new configurations of social capital (relations of trust embodied in new social organizations, and new horizontal and vertical partnerships between institutions) and human capital (leadership, ingenuity, management skills and knowledge, capacity to experiment and innovate).

## SOURCES OF EVIDENCE

This compendium draws on a wide range of sources of information on SARD derived from developing, industrialized and transition country contexts. Three key elements form the cornerstone of this knowledge:

- The FAO dataset developed for the Maastricht conference on Cultivating Our Future, held in September 1999, which contains details of 160 projects ([www.fao.org](http://www.fao.org)).
- The University of Essex dataset developed for the "Reducing Food Poverty with Sustainable Agriculture" research project (1998–2001), which contains narrative details of 47 projects and initiatives in developing countries, plus supporting analytical and descriptive documentation of the whole database of 208 cases ([www.essex.ac.uk/ces](http://www.essex.ac.uk/ces)).
- The FAO Secretariat of the Committee on World Food Security (CFS) and FAO Special Programme for Food Security (SPFS) case studies.

In addition, FAO has organized an e-conference during March 2001 to gather further information and insights on land and SARD initiatives.



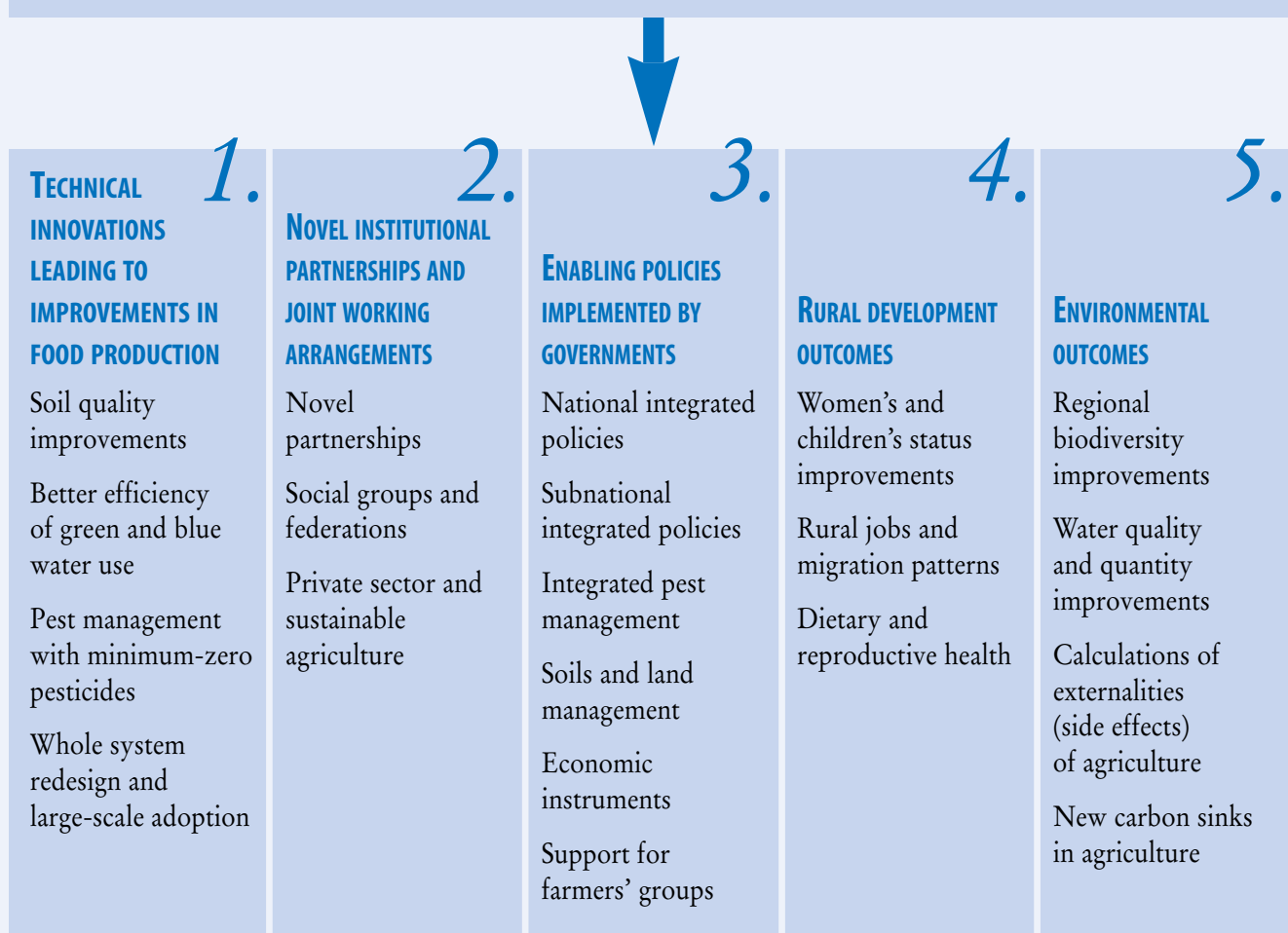
## FRAMEWORK FOR CASES OF SARD

The cases of successful sustainable agriculture were sorted according to a framework comprising of five key questions for decision-makers. These address technical innovations, novel institutional partnerships, enabling policies, rural development outcomes, and environmental outcomes. These are then sorted into 20 secondary areas of interest (see Figure) relating to technical innovations, institutional arrangements, enabling policies, and rural development and environmental outcomes.

Each SARD case is sorted into the most appropriate section according to its primary and secondary pointers to illustrate the main lessons learned from the case. Each comprises a short narrative describing the key elements of both process and outcomes achieved.

### Five primary questions for a compendium of recent sustainable development initiatives in the field of agriculture and land management

1. What technical innovations are leading to improvements in food production with SARD?
2. What novel institutional partnerships and joint working arrangements have been developed to implement Agenda 21 in the agriculture sector?
3. What examples of enabling policies have been implemented by governments to support sustainable land management and SARD?
4. What rural development outcomes have occurred with successful implementation of SARD?
5. What wider environmental outcomes have been achieved with successful implementation of Agenda 21?



## CONFOUNDING FACTORS AND TRADE-OFFS IN SARD IMPLEMENTATION

The evidence shows that Sustainable Agriculture and Rural Development (SARD) as defined in Agenda 21 can lead to rural livelihood improvements. People can be better off, have more food, be better organized, have access to external services and power structures, and have more choices in their lives.

However, most contexts will see the emergence of critical trade-offs and contradictions. The use of one asset can result in the depletion of another – building a road near a forest can mean loss of natural capital, as it aids timber extraction; investing in motorized fishing boats means increased capacity to harvest fish (unless, in both cases, there is strong social capital in the form of institutions to mediate access and ensure sustainable levels of offtake).

This is not to say that depletion of one asset is always undesirable – it may be in the national and local interests to convert part of a forest into finance, if that money is to be used for investment in hospitals and schools, effectively producing a transfer from natural to social and human capital. Equally, short-term social conflict may be a necessary means to overcoming inequitable land ownership, so as to produce higher welfare outcomes.

In some cases, progress in one component of a farm system may cause secondary problems. For example, projects may be making considerable progress on reducing soil erosion and increasing water conservation through adoption of zero-tillage, but still continue to rely on applications of herbicides. In other cases, improved organic matter levels in soils may lead to increased leaching of nitrate to groundwater.

There are a variety of secondary problems that may arise in SARD projects. These include:

- land having to be closed off to grazing for rehabilitation, resulting in people with no other source of feed having to sell their livestock;
- increased household workload, the burden particularly falling on women, if cropping intensity increases or new lands taken into cultivation;
- additional incomes arising from sales of produce may go directly to men in households, who are less likely than women to invest in children and the household as a whole.

There are also a variety of confounding factors that could make SARD ‘successes’ less favourable:

- Sustainable livelihoods based on SARD may be marketing foodstuffs into an increasingly globalized world food system, in which the transport externalities (the negative impacts on atmospheric composition through carbon dioxide emissions) outweigh any localized asset-building;
- Sustainable livelihoods based on SARD which increases the assets base may simply increase the incentives for more powerful interests to take over, such as landlords taking back formerly degraded land from tenants who had adopted sustainable agriculture;
- Sustainable livelihoods based on SARD may appear to be keeping people in rural areas away from centres of power, and ‘modern’ society – some rural people’s aspirations may precisely be to gain sufficient resources to leave rural areas;
- Sustainable livelihoods based on social capital formation and the emergence of significant social movements may represent a threat to existing power bases, who in turn are likely to seek to colonize locally based institutions;
- Barriers to entry may increase as existing adopters of SARD may seek to prevent others from benefiting.

There will also be new winners and losers with the emergence of sustainable agriculture on a significant scale. This model for farming systems implies a limited role for agro-chemical companies, who would not be predicted to accept such losses of market lightly.

It also suggests greater decentralization of power to local communities and groups, combined with more local decision-making. This means reduced opportunities for rent-seeking and other forms of corruption from officials in private and public organizations. Research and extension agencies will have to change too, adopting more participatory approaches to work closely with farmers, and so must adopt different measures for evaluating job success and the means to promotion.

But even if the intention is present for the development of SARD, there are still many threats to overcome or avoid if it is to succeed and spread. These include lack of land tenure or security, civil disorder and wars, institutional inertia, the backlash from potential losers, macro-economic decline of countries or regions, and continued climatic change and disruption.

The globalization of world agriculture will provoke further changes. More control of the world food systems will be centralized in fewer and larger private companies. This centralization could be good, with companies influencing whole supply chains, but is only likely to happen if companies have good ethical and sustainable bases for operations. The effects on small farmers are more likely to be severe than beneficial.

In some cases, the global nature of markets can undermine sustainable agriculture systems, with farmers rapidly shifting away from sustainable practices to exploit a short-term opportunity. Farmers may take advantage of such cash crop opportunities at the expense of food security. Domestic markets can be rapidly lost to cheap imports from countries externalizing some of the real costs of production – such as European countries exporting milk products to India.

## Compendium of recent sustainable development initiatives in the field of agriculture and land management

The main part of this report contains short narratives on 75 sustainable land management and SARD projects and initiatives. These have been chosen for illustrative purposes only, and so should not be seen as a comprehensive listing of all SARD related activities worldwide. There are many hundreds of successful initiatives that do not appear herein, and their omission should not be taken as implying that they are any less effective or successful than those in this compendium.

Each case in this compendium has been selected and classified because it makes a clear contribution to one or more of the five primary questions and twenty secondary areas of interest. Many cases, of course, are multifaceted in their effects, and could have appeared in several sections. For the ease of reading, they only appear once.

<b>Preface</b>	<b>iii</b>
<b>Acknowledgements</b>	<b>v</b>
<b>Acronyms / Abbreviations</b>	<b>vi</b>
<b>Executive summary</b>	<b>vii</b>
<b>1. What technical innovations are leading to improvements in food production with SARD?</b>	<b>1</b>
Land and soil quality improvements	1
Benin: Mucuna (velvetbean) cover cropping	1
Honduras, Guatemala and Nicaragua: Hillside improvement	1
Kenya: Adaptive research programme, Environmental Action Team (EAT)	2
Philippines: Contour farming on sloping lands in Claveria	3
Senegal: Rodale Regenerative Agriculture Research Center	3
Better efficiency of green and blue water use	4
Burkina Faso: Soil and water conservation	4
China: East Gansu Sustainable Agricultural Techniques for Effective Use of Rainfall Resources	4
India: The Society for People's Education and Economic Change, Tamil Nadu	5
Malawi: Small-scale aquaculture	5
Peru: Raised fields in Lake Titicaca Basin	6
Pest management with minimum/zero pesticides	7
Bangladesh: Integrated pest management for rice	7
Kenya: Vutu-sukumu (push-pull) pest management in smallholder systems	7
Philippines: Integrated pest management for highland vegetables	8
Zimbabwe: Organic farming of cotton with natural pest management	8
Whole system redesign and large-scale adoption	9
China: Wheat-Maize Double Cropping System Programme, Hebei Plain	9
India: The spread of soybean cultivation	10
Lesotho: Machobane farming system	10
Madagascar: System of rice intensification (SRI)	11
Nepal: Jajakot Permaculture Programme	12
India: Participatory integrated watershed development	12
Brazil: Conservation 'No tillage' agriculture	13



<b>Burkina Faso:</b> Small scale irrigation development under the Special Programme for Food Security	13
<b>Bangladesh:</b> Co-operative dairy development programme	13
<b>Zambia:</b> Community-based seed multiplication and distribution	14

## **2. What novel institutional partnerships and joint working arrangements have been developed for the implementation of Agenda 21? 15**

### **Novel partnerships 15**

<b>France:</b> National park partnerships	15
<b>India:</b> Indo-German Watershed Development Programme, Maharashtra	15
<b>Kenya:</b> Ministry of Agriculture catchment approach to soil and water conservation	16
<b>United Kingdom:</b> The North Yorks Moors National Park Farm Scheme	17

### **Social groups and federations 17**

<b>Colombia:</b> Comité de Investigación Agrícola Local (CIAL) – in Colombia and seven other countries of Latin America	17
<b>Japan:</b> Consumer cooperatives link to farmers	18
<b>Kenya:</b> Community Mobilization against Desertification (C-MAD) programme	19
<b>Senegal:</b> Federation of Senegalese NGOs (FONGS)	19

### **Private sector and sustainable agriculture 19**

<b>Worldwide:</b> Unilever plc and Sustainable Agriculture Initiative	19
<b>South Africa:</b> Bayer (Pty) Ltd and integrated production in deciduous fruit and vines	20

## **3. What examples of enabling policies have been implemented by governments to support sustainable land management and SARD? 21**

### **National integrated policies 21**

Progress on SARD within countries	21
<b>Cuba:</b> National policy for sustainable agriculture	23
<b>Switzerland:</b> National policy for sustainable agriculture	24

### **Subnational (province, state) and sectoral policies 25**

<b>Brazil:</b> Microbacias (watersheds) and zero-tillage (ZT) programme in Santa Catarina	25
<b>Canada:</b> Toronto Food Policy Council	26
<b>Germany:</b> Regional policies in the Länder	27

<b>India:</b> Government of Rajasthan Watershed Development Programme	27
<b>The Philippines:</b> National Irrigation Administration	27
<b>Solomon Islands:</b> Vocational training in rural training centres	28
<b>United State of America:</b> Support to farmers' markets	29
<b>Integrated pest management</b>	<b>30</b>
<b>India:</b> National IPM Programme	30
<b>Indonesia:</b> National Integrated Pest Management for Rice Programme	30
<b>Sri Lanka:</b> National Integrated Pest and Crop Management Programme	30
<b>Viet Nam:</b> IPM in rice in Mekong Delta	31
<b>Soils and land management</b>	<b>32</b>
<b>Brazil:</b> Zero-tillage in large-scale farms in Paraná and Rio Grande de Sol	32
<b>Malawi:</b> Agroforestry extension project (MAFE)	32
<b>Economic instruments</b>	<b>33</b>
<b>Europe:</b> Environmental taxes in agriculture	33
<b>Support for farmers' associations and groups</b>	<b>34</b>
<b>Australia:</b> National policy for landcare groups	34
<b>India:</b> Water users' associations in Gujarat	34
<b>Pakistan and India:</b> Microfinance for local groups	35
<b>4. What rural development outcomes have occurred with successful implementation of SARD?</b>	<b>37</b>
<b>Improvements in women's and children's status</b>	<b>37</b>
<b>Kenya:</b> Benefits to children's health and nutrition	37
<b>Uganda:</b> Household livestock development	37
<b>Zimbabwe:</b> Chivi Food Security Project	38
<b>Rural jobs and migration patterns</b>	<b>38</b>
<b>India:</b> KRIBHCO Indo-British Rainfed Farming Project (West)	38
<b>Italy:</b> Multifunctional olive cultivation contributes to local jobs	39
<b>Mexico:</b> ISMAM fair-trade coffee	39
<b>Niger:</b> Soil and water conservation	40
<b>United State of America:</b> Green enterprises in Willapa Watershed of the Pacific Northwest	41

Dietary and reproductive health	42
<b>Bolivia:</b> PRODINPO (Integrated development programme, World Neighbors, Northern Potosí)	42
<b>China:</b> Rice-fish systems benefit health in Jiangsu Province	42
<b>Ethiopia:</b> Cheha Integrated Rural Development Project	43
<b>5. What wider environmental outcomes have been achieved with successful implementation of Agenda 21?</b>	<b>45</b>
Regional biodiversity improvements	45
<b>El Salvador:</b> Promotion of biodiversity conservation within coffee landscapes	45
<b>Estonia:</b> Integrated management of Matsalu wetland	46
<b>Greece:</b> Organic agriculture in Prespa National Park	46
<b>Spain and Scotland:</b> Agricultural systems that benefit bird biodiversity	46
<b>United States of America:</b> Darby Watershed Project, Ohio	47
<b>Wales:</b> Red Kite Project	47
Water quality and quantity improvements	48
<b>Sri Lanka:</b> The Rehabilitation of Gal Oya Irrigation Scheme in Sri Lanka	48
<b>United States of America:</b> Clean drinking-water from agricultural watersheds in New York State	49
Calculations of externalities (side-effects) of agriculture	49
Externalities in Europe and North America	49
New carbon sinks in agriculture	52
Summary of carbon issues in agriculture	52
<b>Argentina:</b> No or Zero-till farming	52
<b>Conclusions</b>	<b>55</b>
<b>References cited</b>	<b>57</b>