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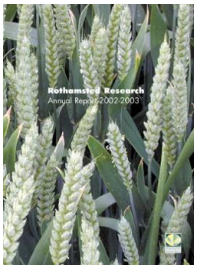
Rothamsted Research Annual Report 2002-2003



Full Table of Content

Interactions Between the Environment, Society and Technology

Rothamsted Research

Rothamsted Research (2003) *Interactions Between the Environment, Society and Technology ;* Rothamsted Research Annual Report 2002-2003, pp 40 - 43

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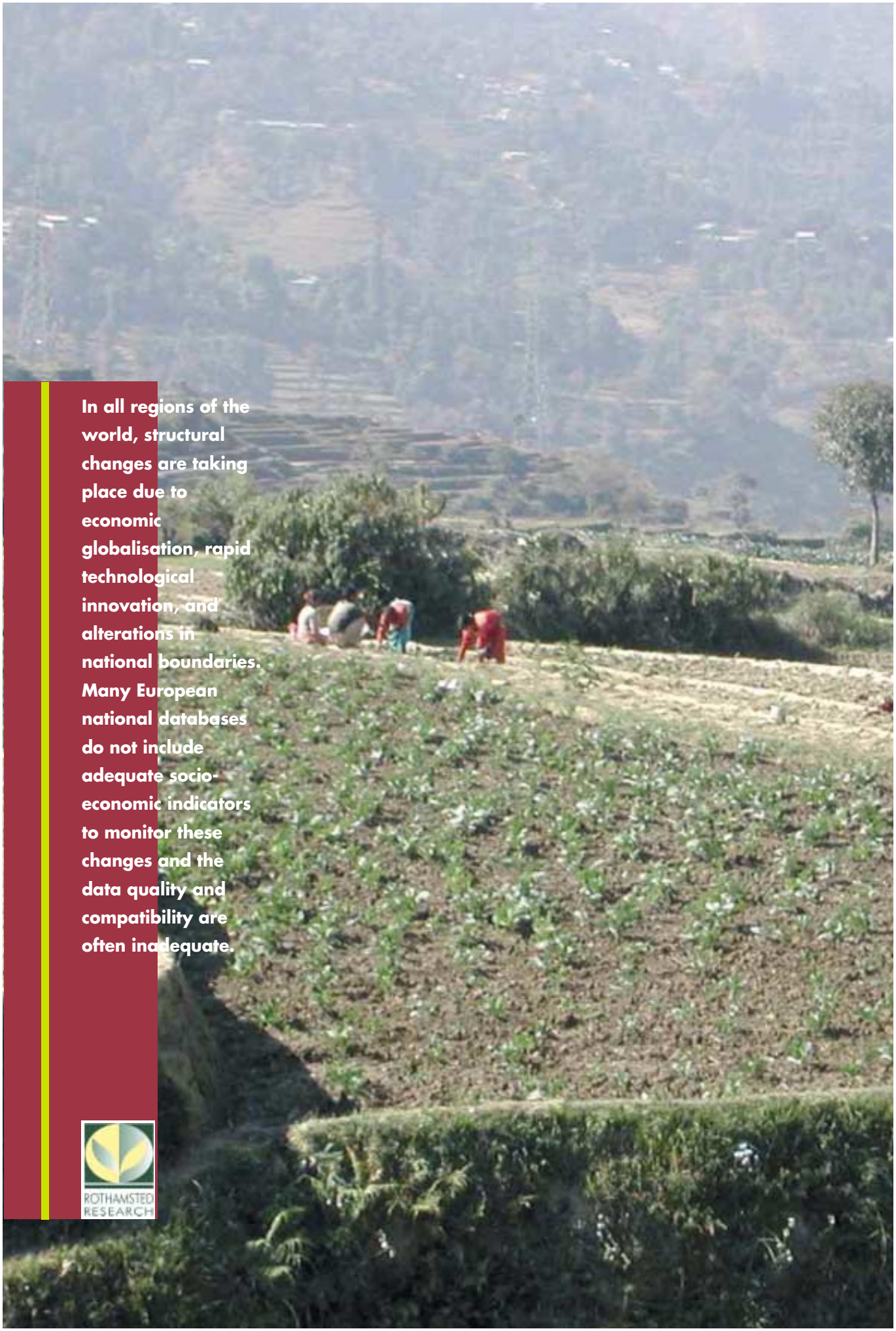

In all regions of the world, structural changes are taking place due to economic globalisation, rapid technological innovation, and alterations in national boundaries. Many European national databases do not include adequate socio-economic indicators to monitor these changes and the data quality and compatibility are often inadequate.

ROTHAMSTED RESEARCH

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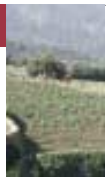

Interactions between the environment, society and technology

Janet Riley

Introduction

Dialogue between different groups in society is becoming ever more important in a world that is increasingly interlinked. Such communication must take into account structural aspects and diversities such as socio-economic status, cultural values, gender, employment availability, poverty levels and age. These complex inter-relationships need to be translated into a language understood by both political decision-makers and the players of civil society.

This is a new area of work that the Institute is seeking to make a contribution to, primarily though funding from DFID (Department for International Development) and the European Commission. It is very different to the traditional science carried out by Rothamsted, but at a national and international level, such cross-cutting work is seen as vital. Rothamsted, with its history of research in sustainable agriculture is well-placed to make such a contribution.

Women working on terraces in Nepal. (left)

Describing a participatory method. (right)

INTEREST

The UNIQUAIMS (Unification of Indicator Quality for Assessment of Impact of Multidisciplinary Systems) project, funded by the European Commission and co-ordinated by Rothamsted Research from 1998-2002, highlighted the poor appreciation of knowledge structures and relationships, as well as the inadequacies of indicators by which social and economic change are assessed. The collection of socio-economic data is scarce and irregular while reliable indicators of both environmental change and sustainability are poorly developed.

The on-going INTEREST project (Interactions between the Environment Society and Technology), also funded by the European Commission and co-ordinated by Rothamsted, is studying the current farmer and community ecosystem practices in five ecosystems in India, Sri Lanka and Nepal. It will link this to available scientific knowledge to analyse and describe changes in the pressures between environmental policy, social challenges and technological innovation. By the end of the project a range of dissemination tools will have been developed to deliver this improved knowledge to all levels of society. This will provide a greater understanding of environmental challenges at all social levels and lead to improved ecosystem management strategies for sustainable livelihoods.

India, Haryana

Degraded forest bamboo ecosystems

There are 125 indigenous, as well as exotic species of bamboo belonging to

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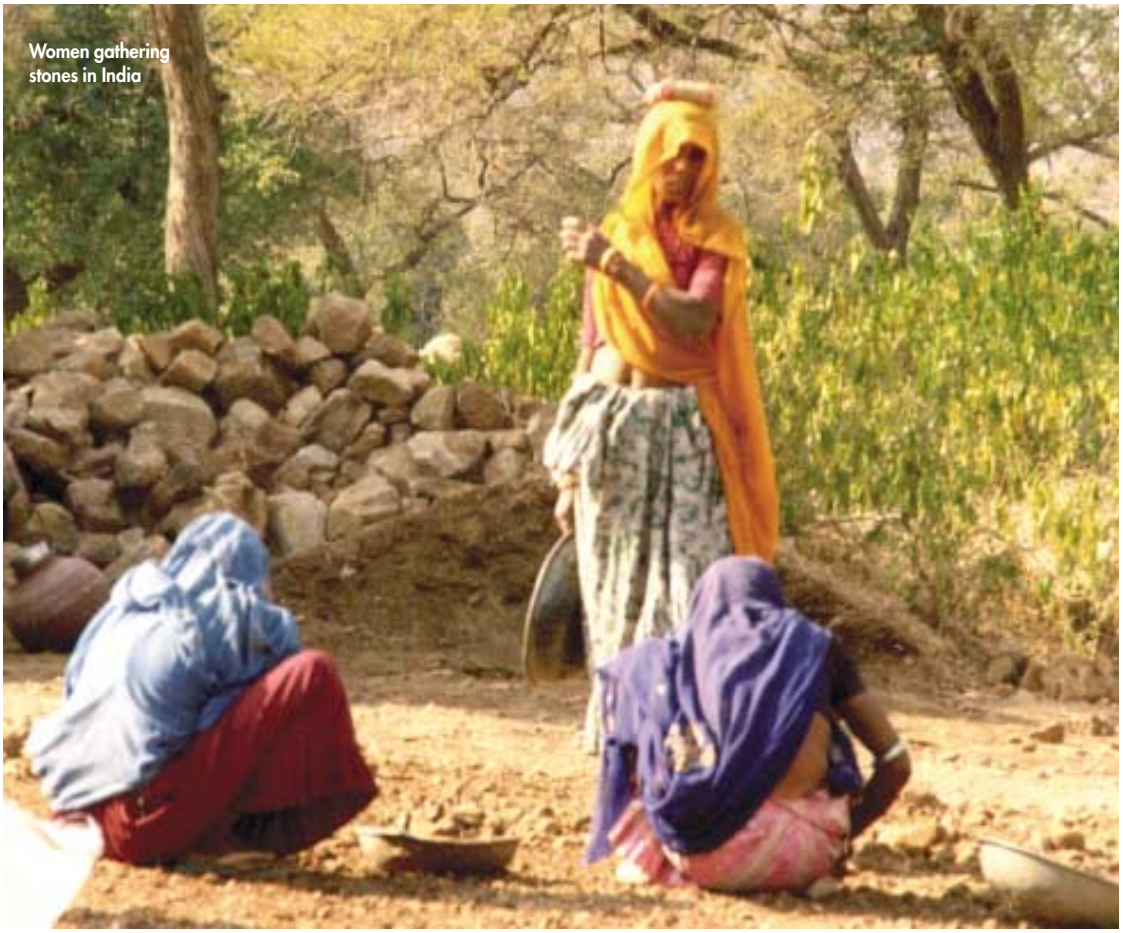
Conducting a participatory methods workshop in Sri Lanka

23 genera, occupying 10.03 million ha (12%) of the total forest area of India. Bamboo is used extensively in India to support livelihoods, for basket-making, medicines, charcoal (for batteries), paper pulp and fodder. The intricate rhizome systems of bamboo are also useful for soil conservation. The Bhanjdas, the basket-making community of Haryana, are solely dependent on bamboo. After the formation of the State of Haryana, the Haryana Forest Department issued permits for bamboo extraction to the Bhanjdas, but population pressure and the growth of the market economy resulted in degradation of the bamboo system. A formal liaison between local communities and the Haryana Forest Department has reversed the degradation and has provided employment, more bamboo and community funds. Some social, economic and legal hurdles still exist, such as poor returns on sales. The process of change and reasons for the existence of legal hurdles is the subject of this study.

India, Karnataka

Small-scale farming systems in the peri-urban and rural areas of Karnataka

Farms and systems in this region are small (less than 1 ha land) and the main crop in the coastal region is paddy grown in three seasons, *khariff, rabi* and summer. Further inland, cash crops such as arecanut, coconut, cocoa, pepper and cashewnut are grown. Pulses and commercial sugar cane are also cultivated. Over the last few years there have been changes



Women gathering stones in India

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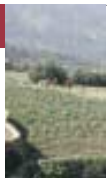

from non-commercial monsoon-dependant rice paddy to commercial irrigated crops of coconut, arecanut and sugarcane. This is partially due to rising labour costs, difficulties with paddy cultivation, environmental factors, such as increased soil salinity, and low returns on produce. The process of this technological change and its impact upon societies and the environment is not fully understood as it has not been monitored in depth.

India, Goa

Degraded aquaculture systems

The traditional khazans aquaculture systems are based on the principle of salinity regulation and tidal clocks. Estuaries, mangrove areas, embankments (*bunds)*, creeks, sluice gates and drainage canals are part of these complex systems which are being damaged by local people in pursuit of short term economic gain. The ecological balance of the system has been altered through the introduction of non-traditional species and fishing systems. Other problems include the salinisation of the land, caused by inadequate maintenance of embankments, availability of markets and changes in management arrangements. The processes underlying these technological changes must be understood and then the relationships between the impact of these changes upon societies and the environment can be determined.

Sri Lanka

Small-holder rubber production

Large and medium estates account for most of the rubber production in Sri Lanka. Rubber production on the 155,000 small-holdings of less than 4 ha each accounts for about 33% of the total rubber production. Poor performance of these small-holdings has been related to unsatisfactory diffusion and adoption of new technologies. The four most important management practices to ensure reduction in immature periods and promote high latex yields are the use of high yielding clones, application of recommended fertiliser levels, weed control and ground cover management. Understanding of the social, technological and economic reasons for non-adoption of these technologies and the interactions between them is necessary. Also of importance is the Sri Lankan government's formation of small-holder societies, *Thuru Saviya,* to help them in marketing, providing subsidised materials, low-interest loans for smoke house construction/renovation and improving technical know-how.

Nepal

Degraded forest-watershed systems

The typical Tamang village setting is of about 100 ha set in the mountains with forests, rivers, agricultural land (rainfed and irrigated), and grazing lands. The forests, (and associated rivers and land) formerly government-managed, are now run by the local communities. Women, particularly, use the natural resources in an integrated way to meet their basic needs, applying indigenous knowledge and making decisions by a democratic process. The type of livelihood is often caste-based with the Brahmin/Chhetri being most active in tree-growing. The resource base is facing great pressure to meet both basic needs and market demands.

Our partners, TERI (Tata Energy Research Intitute) of India, the Rubber Research Institute of Sri Lanka and ENPHO (Environment and Public Health Organisation) of Nepal, gathered local data in these ecosystems. The teams undertook RRA (Rapid Rural Appraisal) for each study area, field visits to collect and study data, open interviews with key participants along with a detailed household survey, and PRAs (Participatory Rural Appraisals).

The collected data have now been analysed by the Asian teams and the results presented at the first workshop, held in Nepal last December. Potentially useful indicators have been identified. Interventions are being applied during the second year to introduce changes to the systems and monitor these in parallel with present systems. Future work will build on this with further data collection and analysis to refine the indicators. Finally we will have an appreciation of the key pressures and indicators causing change in the selected ecosystems and the changing relationships between the key technological, social and environmental pressures of each ecosystem.

A sluice gate controlling a Khazans aquaculture system

A variety of ways will be developed to share this information with the public, from scientific reports and formats appropriate to funding bodies and governments, to locally distributed materials in local languages in each ecosystem.