The Characterisation of Six Natural Resources Production Systems

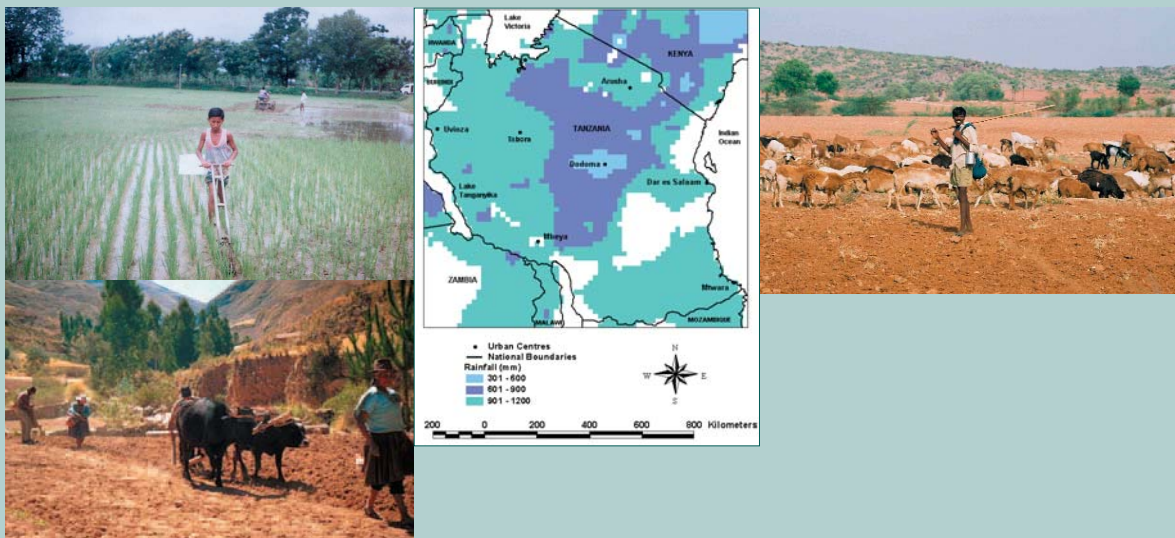J. Taylor, M. Tang, C. Beddows, F.M. Quin, M.A. Stocking

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Natural Resources Systems Programme

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2   NATURAL RESOURCES SYSTEMS PROGRAMME (NRSP)

2.1   OVERVIEW OF NRSP

In common with all research programmes of DFID's RNRRS, the Natural Resources Systems Programme (NRSP) has a ten-year life from April 1995 to March 2005. The programme's purpose is to deliver new knowledge that can enable poor people who are largely dependant on access to and use of natural resources (NR) to improve their livelihoods. The central focus of NRSP's research is ways and means to improve the management of natural resources covering three inter-related fields – the NR-base itself; the integrated and dynamic nature of people's livelihoods and how these affect their decision-making and capacity to use and manage the NR-base; and the institutional environment in which NR management strategies are designed and implemented.

The programme is implemented through a competitive grant award scheme for commissioning of individual projects. Over time, this scheme has established an annual portfolio of some 30-50 research projects. While each project has its own individual objectives, all are designed to contribute to the attainment of both NRSP's overarching purpose, and the objectives that DFID specified for NRSP with respect to each production system of the RNRRS. Projects are of varying duration (from 3 months to 3 or 4 years) and are carried out by overseas and UK-based organisations.

2.2   PRODUCTION SYSTEMS AND TARGET COUNTRIES

2.2.1 Summary

The RNRRS defines *six production systems* for the total scope of its natural resources research and NRSP addresses all these, namely:

- High potential production systems (HP)
- Hillsides production systems (HS)
- Semi-arid production systems (SA)
- Forest agriculture interface (FA and FAI)
- Land water interface (LW and LWI)
- Peri-urban interface (PU and PUI)

In its original design, from two to six countries were targeted for NRSP for each production system (PS) but as from April 1999, in line with a directive from DFID, NRSP limited project commissioning to a maximum of three countries per PS. The target countries are variously located in three target regions (Sub-Saharan Africa, the Indian sub-continent, and Latin America and the Caribbean).

Details of the target countries and the production systems that NRSP's research addresses in these countries are shown in Table 2.1 (see following page). In conformity with the RNRRS, for the purpose of defining geographical coverage of the LWI, the term 'target country' is applied to the Caribbean region.

2.2.2 High Potential Production Systems

High potential production systems are found in regions characterised by a favourable climate, relatively fertile soils and considerable ground water resources in some instances. These systems also have high population densities commonly associated with small land holdings and circumstances that intensify the use of land for arable cropping. Recent and current projects concern irrigated production systems in Bangladesh and the lower Indo-Gangetic Plains in India, and rainfed upland systems in south western Kenya and eastern India. For varying reasons, in spite of the high potential of the NR base, the rural populations in the areas targeted by NRSP are distinctly poor and disadvantaged, presenting a considerable challenge to the ways by which NR management research could assist livelihood improvement. On-going and planned projects emphasise integrated participatory approaches to raising awareness of options for farming-based enterprises and the management of farm

land and water resources, and link these with the identification and testing of forms of rural service provision that are relevant to and can reach poor people.

2.2.3 Hillsides Production Systems

Hillsides production systems are characterised by farming activities (crops and livestock) on steep slopes where difficult terrain results in poor accessibility, limited infrastructure and markedly impoverished communities. Use of these marginal lands has led to their degradation with soil erosion, declining soil fertility and deforestation all contributing to low productivity. In addressing these land management problems, NRSP adopts a holistic strategy towards the development and promotion of improved farming strategies that meet the needs of marginal farmers. Current projects are in Bolivia, Nepal and Uganda. All projects, in varying ways, emphasise the factors that limit people's adoption of available technologies for improving their management of natural resources.

Table 2.1: NRSP Target Countries by Production System, as of June 2000

Region	Countries	Systems					
		HP	HS	SA	FA	LW	PU
Sub-Saharan Africa	Ghana				■		■
	Kenya	■					
	Tanzania			■			
	Uganda		■			tbd*	
	Zimbabwe			■			
Indian Sub-Continent	Bangladesh	■				■	
	India	■		■			■
	Nepal		■		■		
Latin America & Caribbean	Bolivia		■				
	Brazil				■		
	Caribbean					■	

■ Target country for projects   tbd To be decided after reviewing the output of a programme development study

2.2.4 Semi-Arid Production Systems

Semi-arid production systems characteristically occur where agricultural activities and livelihood strategies are constrained by poor natural resources (principally low and erratic rainfall and infertile, poorly structured soils). Although past projects were conducted in Kenya, Nigeria, Tanzania and Zimbabwe, the current target countries are India, Tanzania and Zimbabwe[4]. Recently completed projects in Tanzania and India have centred on the understanding of livelihoods of the poor, in respect of coping strategies, dependence on common pool resources (CPRs), and NR management strategies. Based on this understanding, research for the final years of the programme term will focus on the development and promotion of improved strategies for NR management under varying land and water tenure regimes.

2.2.5 Forest Agriculture Interface

The forest agriculture interface targets areas that are in transition between primary forest on the one hand and settled agricultural land use on the other. Two land use dynamics are identified, the first involving initial forest conversion and the second involving the development of subsequent types of land use. Features of the FAI vary between target geographic regions (i.e., between West Africa, Amazonia in Latin America and the hill zone of Nepal). However, a common feature in terms of people's livelihoods is that interdependency between crops and forests or tree-based systems is integral to all three, possibly with livestock as an additional common feature. Current and planned projects concern the assessment and further development of: participatory approaches to CPR management; improved land use; and strategies to improve the integration of livelihood perspectives into NR management policies.

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[4] / Zimbabwe was phased out as a target country in early 2001, after this Study was completed.

2.2.6 Land Water Interface

The land water interface is located in regions where both aquatic and terrestrial resource systems co-exist in space and time. The interface targets two ecosystems – coastal zones and floodplains. The Caribbean is targeted for the coastal zone, with priority given to the aquatic environment, emphasising coral reefs and lagoons, mangroves and sea-grass beds. In addition, in order to address impacts on that environment, the research takes a wider approach to production constraints and considers land use practices and zoning in coastal ecosystems. In this way, the research aims to establish appropriate management actions to address all factors that may impact on the target habitats. Bangladesh is the target country for floodplains research. A similar conceptual approach as that for coastal zones applies for this inland aquatic system. A broad approach is taken to production and management constraints in order to consider all possible influences on the LWI. To date the portfolio has concerned livelihood strategies in the LWI and new approaches to integrated NR management that can benefit the poor. The future portfolio will include more projects relating to institutional arrangements for sustained uptake of improved management strategies. The lakeshores of the Lake Kyoga inland wetland system in Uganda may be added (for the floodplains ecosystem), dependent on the outcome of a Programme Development assignment, which is currently underway, and available funding[5].

2.2.7 Peri-Urban Interface

The peri-urban interface is created by urban development. As urban activities grow and spread, links or impacts upon rural activities in the countryside are created. These cause changes to existing production systems and create new ones that can affect the poor in both urban and rural areas. Opportunities arise from easier access to urban markets, services and jobs, and the re-use of urban wastes. Problems arise from the conversion of land, urban pollutants, farm labour shortages and the loss of natural resource based means of livelihood. During the first phase of NRSP, projects generated substantial new knowledge of peri-urban natural resource use in livelihood strategies near to Kumasi in Ghana and the twin towns of Hubli and Dharwad in India. New projects are underway to test the validity and utility of the new knowledge in bringing about pro-poor changes in natural resource management through the creation – using participatory processes – of action plans that will be implemented in pilot projects.

2.3   PURPOSE OF THE SYSTEMS CHARACTERISATION STUDY

As stated in Section 1, the purpose of the Study was to enable the NRSP management team to make a relatively robust assessment of priorities between the six production systems, including the strategic implications for appropriate levels of fund allocation. The assessment is based on a characterisation of each production system against a set of common criteria. In line with DFID's policy and development priorities, these criteria enabled the development of profiles that either directly, or through suitable proxy indicators were linked to assessments of poverty and the opportunities and constraints within each production system for achieving livelihood improvement.

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[5] / Although the Programme Development study had favourable findings with respect to NRSP-LW in Uganda, budget restrictions prevented the intended follow up.