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SOCIO-ECONOMIC METHODS IN NATURAL RESOURCES RESEARCH

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Introduction

The format of this NRP is unconventional: it synthesises a number of review papers prepared for a UK Overseas Development Administration (ODA) workshop on Socio-Economics Methods for Natural Resources Research. The ODA s Renewable Natural Resources Strategy (RNRRS) manages natural science research across eleven discipline-based programmes. Most are contracted out to external managers, but the Natural Resources Systems Programme (NRSP) is managed within ODA. The Socio-Economics Methodology (SEM) component of the NRSP is responsible for commissioning work on the development of novel research methods in the social sciences with specific relevance to natural resource management. It commissioned ODI to host the workshop on 29 30 April 1996, which aimed to review the range and recent applications of socio-economic methods currently available to natural resources research managers. A cross-section of natural and social scientists were invited to participate in the presentations and discussions, to examine the fit between the socio-economic methods that are currently available and those that are needed by natural scientists, and to identify priorities for the further development and adaptation of social science research for natural resources management.

Eleven review papers were presented at the workshop. They covered (in the sequence discussed below): aspects of farmer participation (6 papers); a reinterpretation of systems approaches; monitoring and evaluation (2); uptake and promotion pathways, and potential applications to NR research of a Policy Analysis Matrix. The selection of themes was determined by ODA s perceptions of its priorities early in the formulation of the RNRRS, and left a number of gaps. There was, for instance, no discussion of multi-agency approaches (but see Alsop et al. 1996), nor of techniques to monitor such approaches (or NR research itself) as a process (but see Mosse et al., forthcoming).

The remainder of this paper draws out the main points made in individual review papers.

Papers at the workshop developed 6 sub-themes within the broad theme of client orientation and participation, including: methods of needs assessment, of participation in other parts of the research cycle, of managing the interface between external and local knowledge and of stakeholder and gender analysis. A further paper challenged conventional perceptions of farming systems research.

Needs assessment

Gordon (1996) identified as the strengths of rapid and participatory needs assessment: their ability quickly to gain information on new areas and identify issues of which there was little prior outsider knowledge; their relatively low cost (although there are hidden costs, for instance, in training); the scope they offer to explore issues which emerge as particularly important; explicit attention to the avoidance of certain biases; the potential that needs assessment offers to identify communities where subsequent field research may be conducted; and, in the best cases, their ability to empower communities. A number of preconditions for success are also evident: focus and clarity of objectives are important if these techniques are to generate results that can be translated into research priorities, and the field team must incorporate relevant disciplines and skills. However, many of these skills (calling for sensitive interview techniques and discretion in recognising and following-up key issues) are difficult to teach.

Barriers to uptake may be found in four areas: institutional issues (e.g. the difficulty of assembling multi-disciplinary teams), scepticism (over the potential of participatory methods), reluctance stemming from a perceived threat to normal ways of designing research, and resourcing issues, e.g. the reluctance to divert funds from real science to needs assessment.

Revisiting farm management methods

Within needs assessment, Dorward et al. (1996) revisit both farm management research and RRA/PRA and argue for farm management type methods that draw on elements of both to help farmers and researchers to quantify and analyse the use of resources in farms and households, and so assist in the identification of researchable constraints and opportunities. They could also enable researchers to consider with farmers, prior to research, the likely resource-use implications at the farm level of implementing possible solutions, and so improve the impact of research. Such methods include forms of participatory budgeting, new types of budgets, resource-flow diagramming, and developing appropriate combinations of tools to form simple models.

There is scope for using such methods across a range of research areas and farming systems. Several uses of the methods other than in needs assessment can be identified (e.g. in the design and evaluation of experiments with farmers). Similarly, potential uses suggest themselves with agents other than smallholder farmers (such as processors and traders involved in post-harvest activities).

Farmer participatory research

Addressing central issues in farmer participatory research (FPR), Martin and Sherington (1996) argue: that

it permits a better technology fit with the farming system and farmers constraints; that on-farm participatory research can adjust technology to particular environmental conditions; that it allows more rapid testing, evaluation and adoption of technology; that it can more effectively identify technology improvements which work for poor people and women; that it builds on local knowledge and farmers capacity for experimentation; and that it can create a channel for farmers to influence research priority setting. FPR has increased options and possibilities for complementary approaches, linking on-station trials with farmer designed and managed investigation. Difficulties faced in introducing FPR are in participant selection, the compatibility of farmer-led and scientific approaches, experimental design and data analysis, and the limited influence of farmers on the wider research policy context. An important question is the extent to which the findings generated by location-specific, participatory research are applicable and transferable to similar systems elsewhere.

Martin and Sherington also examine possibilities for the wider use of statistics in participatory research. Modern statistical methods have a useful role in participatory research, but knowledge of these is limited due to the lack of suitable texts and, until recently, the lack of easily accessible computer software. Examples are given of a number of useful statistical advances in techniques for the analysis of qualitative data. Assessing effectiveness of participatory approaches is difficult as they are context sensitive. Many pilot programmes and projects have resulted in more productive technologies, but few have estimated benefits in relation to the costs, or developed criteria for doing so. The resources needed for collaborative participatory work are often underestimated, as are the difficulties of introducing wide-scale participatory approaches into public sector organisations. Critical areas here are innovations in personnel and research programme management, skill development, stronger multi-agency linkages, and greater capacity of farmers organisations and NGOs to create demands on the public sector.

Local knowledge

Focusing on one aspect of participation, the need for out-siders to understand and respond to local knowledge (LK), Blaikie et al. (1996) identify NR research projects as a key interface between local and scientific knowledge. LK can be manifest in different ways at this interface, for instance as Knowledge-in-Action , or, more fundamentally, as a means of empowerment. But local knowledge can only be equit-ably negotiated between local and external actors where research is conducted in a collegiate mode (Biggs, 1989). Barriers to fuller incorporation of LK into research and development projects include the (often unacknowledged) social and political agendas of outside agencies, the professional and cultural background of their staff, and the often contradictory agendas amongst local people and outside agencies. Structural and behavioural factors often lead outside agencies to design projects without allowing time for local participation. In addition, outsiders are often not adequately trained to recognise and deal with unacknowledged professional and cultural agendas which may underlie interactions between outsiders and insiders.

Progress towards removing some of these barriers can be made by introducing new skills into the design and implementation of projects, including facilitation, conflict management, and negotiation, and by supporting existing local networks and pathways, and successful outsider insider institutions.

In terms of project management, some preliminary funding may be required to ensure early dialogue between scientists, development workers and intended beneficiaries, so that a clear shared understanding of the design and implementation process can be gained. Furthermore, policies at the national level in developing countries should be examined to see in what ways they encourage or discourage the resilience, vitality and adaptability of LK. They may have particular relevance to, for instance, the extent to which LK incorporated in plant selection is protected by legislation on intellectual property rights.

Stakeholder analysis

Turning to broader ways of working with clients, Grimble and Wellard (1996) define stakeholder analysis (SA) as an approach for understanding a system, and changes in it, by identifying key actors and assessing their respective interests in that system. It has been developed in response to the challenge of multiple interests and objectives: namely, the search for efficient, equitable and environmentally sustainable development strategies.

The particular characteristics of NR research relevant to stakeholder analysis include: multiple uses and users of the resource, unclear or open access property rights, temporal trade-offs and imperfect markets. SA clearly has much potential where interventions are likely to involve conflicts and trade-offs, such as in the cases of common property resources. However, whilst it can illuminate the interests of marginalised groups, it cannot in itself guarantee stronger representation of these groups. Experience on how it might be best used in practice remains limited, but there is little to be lost, and much to be gained, by conducting an informal SA before any other stages of NRM are embarked on.

There is no right or wrong approach to SA: each situation should be assessed independently. In some cases, for example at the design stage of relatively uncontroversial projects, the early and (as far as possible) equal involvement of all stakeholders or their representatives is appropriate. But in cases of serious conflicts of interest, particularly where certain stakeholder groups have relatively weak social, economic or political bargaining positions, shuttle diplomacy or bilateral negotiations may be more appropriate than round table negotiations.

Further, the interests and agenda of the agency directing or acting as a catalyst in SA should be made explicit by using a social actor perspective. This will indicate their intentions regarding involvement in or commitment to the particular NRM issue and also help to prevent raising unrealistic expectations amongst primary stakeholders

Gender needs

Turning to a specific category of stakeholders, Goldey et al. (1996) argue that integrating gender policy into development projects and research has become a priority for international donor organisations and NGOs. The softening or elimination of gender hierarchies is on the agenda in most national programmes, although not always explicitly so, and with differing strategies, rationale and investment rates from agency to agency.

Approaches adopted in the 1980s and 1990s for gender-sensitive analysis and planning include: profiles of activity, of access to and control over resources, of benefits and decision- making, and input access, and of roles, needs and division of labour.

Several arguments have been made for a fuller incorporation of women s concerns into the design of development:

- project design and implementation will not be efficient unless beneficiaries are clearly targeted;
- some argue a strategic need to challenge customary gender relations, implying the need for a change in the distribution of power and control between men and women.

The socialisation process which supports gender inequalities in practice inside and outside the household is protected by customary behaviour and attitudes. In the political, technological and organisational spheres from grassroots to national levels, the same principles of gender stratification or hierarchy are maintained. As a result decisions taken and implemented in these spheres reflect gender inequalities. Examining the process of technology development in relation to gender means understanding the complex socio-economic context in which technology is adapted, adopted or rejected, and the interactions between the technology and the resource users, owners and controllers. To be successful, technology development should be based on awareness of the key socioeconomic questions: who owns what? who does what? who gets what? what do they do with it? who takes the decisions? what difference will this innovation make to whom?

A reinterpretation of systems approaches

Reviewing the current status of FSR, Ison et al. (1996) argue that problems continue to be misspecified by researchers, and by different disciplines and agencies all seeking to impose their own view. They argue for better communication and mutual understanding between scientists and agencies. Systems methodologies can help to bring this about. Power relations affect outcomes and agendas, however. Two strands of NR R&D are identified: FSR and systems learning. Both have extended from farming to rural livelihood and food systems. Thisreinforces their claims to holism but increases demands on them. FSR acknowledges that both natural and socioeconomic science are necessary to NR research but success in synthesising them has been limited, partly owing to inadequate political and institutional analysis. The systems learning strand is increasingly apparent. It stresses that systems is an approach rather than an objective entity that is the same to everyone. This awareness is important to guide participatory, people-centred R&D. So is capacity to engage in dialogue and build relationships because problems and solutions are formulated as a collaborative exercise specific to the socioeconomic situation.

Participatory approaches to NR management have at times been no more than an uncontextualised toolbox of techniques, hence the move Beyond Farmer First to greater synthesis of practice and theory, researcher and researched and a social contextualisation of natural resource systems.

Systems methodologies can meet the need for exploring between different perspectives - farmer and researcher, biologist and social scientist to achieve collaboration rather than conflict. A range of

techniques are used to facilitate this based on the principle that communities or organisations facing problematic situations only cohere if they are compet-ent at dealing with differences that emerge within the group.

These arguments are illustrated by the example of relationship and institution building in Sri Lanka. Catalyst motivators nurture the emergence of farmer organisations, starting with individuals and gradually aggregating and formalising at a pace set by the farmers. Learning processes are used throughout. Power is delegated from below and farmer representatives sit on all committees. The key to 15 years of success has been emergence, iterative learning and a gradual pace.

Monitoring and evaluation

Farrington et al. (1996) review the methodology of M&E in relation to research in three distinct contexts:

First, reviewing methods for assessing the economic impact of R&D and estimating rates of return, they argue that methodologies being developed in the North should be promoted in ldcs, to replace the crude methods still widely in use there which systematically overestimate rates of return. However, simultaneous efforts need to be made to improve the quality of databases underpinning these applications.

Second, they review progress in monitoring and evaluation at the programme-project interface within Logframe approaches, concluding that there are currently major weaknesses in identifying the implications of progress at the project level for overall programme management, and vice versa. In particular, project-level logframes are geared towards providing information on physical and financial progress, but the value of this information in monitoring impact at the programme-level is limited. Nor do they include assessment of the intermediate outputs commonly produced by research which are intended for use by organisations outside the programme frame.

The review suggests that lessons might be learnt from examples of research management in the commercial sector, in which: management is focused on the research process; a high proportion of exploratory work is expected to fail; there are clear decision rules for screening projects before they enter successive (and increasingly costly) stages of R&D; and Critical Success Factors (CSFs) are identified at initiation and used to improve the early identification of best bet projects.

Third, following the conceptualisation of FPR at the beginning of this paper, they set out a Logframe approach for monitoring and evaluating FPR. They argue for a clear distinction from the outset between two possible purposes: the development of new participatory methods, and the development of new technologies through adaptation and application of these methods. Three areas of concern (consultation, capacity-building and institutional strengthening) can relate to each purpose, and FPR projects can then identify outputs and indicators of performance for each cell of this 2 x 3 matrix. But several caveats are important: indicators need to relate at least as much to the process of conducting FPR as to the products it generates, and qualitative information on performance is especially important in FPR. Finally, conventional approaches to consensus building (such as TeamUp) may prove exceptionally difficult in FPR projects where clear pathways towards outputs cannot always be identified in advance, and

performance criteria are likely to be highly specific to socio-economic settings, and to evolve over time.

In an effort to develop guidelines for assessing the uptake of research, Riley and Alexander (1996) argue that proposals for impact assessment need to be incorporated into the project design and that the information generated requires skilful aggregation if estimates of impact are to be unbiased. Drawing on other areas of research, they argue that aggregation across different types of data in agriculture has received inadequate attention. In response, the authors propose a method for collection of core indicators for monitoring and evaluation. They also propose subsidiary indicators for broader impact evaluation within a time period and locality beyond the immediate project zone. Methods are given for aggregating across a large and multidisciplinary data set, and guidelines set out for achieving and maintaining the quality information and aggregation within the process of project implementation and impact.

Promotion and uptake pathways

Reviewing the promotion and uptake of RNR information and technology, Garforth and Usher argue that the main factor influencing uptake by users is the relevance to them of the information and technology itself. Relevance is not inherent in the research output but a function of specific contextual factors. With uptake (e.g. of a new laboratory technique) by intermediate users, features of the research process and the target institutions are also potentially significant, as are scientists reward systems, which in turn influence their priorities. Context-specific indicators of uptake of different types of outputs therefore need to be developed.

Relevant analytical frameworks for exploring uptake include models of the technology development process, of information processes and of the research management process. Systems models allow us to move away from unilinear conceptions of technology development, and can deal more effectively with the diversity of information sources and channels available to potential users. This is also true of the multiple source of innovations and farmer first models. Each framework has its uses and limitations: it is important to select one that is most suited to the type of research output and the particular issues under consideration, and then to use methods appropriate to both the framework and the context.

A wide range of socioeconomic research methods have been used. Standard sample survey methods have limitations and alternatives are suggested, including: various PRA methods such as institutional mapping and Venn diagrams, complete enumeration of communication networks, and snowball sampling in which a purposively identified single respondent provides leads to successive interviewees.

As far as promotion is concerned, publication, face-to-face interaction and electronic communication are the main pathways for promotion to fellow scientists and are significantly influenced by the length of relationship between collaborating institutions, and degree of stability in research team composition. Poor access to scientific publications among ldc researchers is a major constraint. As regards end-users, there is undoubtedly a lot of untapped potential in the emerging communication technologies (video; local vernacular radio) for low cost, effective access to agricultural information.

Policy analysis and NR research

Kydd et al. (1996) review the role and usefulness of the Policy Analysis Matrix (PAM) in the economic analysis of commodity systems where the aim is to inform agricultural research policy.

The PAM permits estimation of the Domestic Resource Cost Ratio (DRC), i.e. an approximate indicator of the underlying comparative advantage of a commodity system, which may be obscured by policy interventions and market failures . Where the economic policy context is changing radically, e.g. as a result of economic reform programmes, the PAM framework can combine technological and economic dimensions in examining an inventory of feasible technological developments for their impact on underlying comparative advantage and so helps to identify likely future winners . This is a fruitful procedure for the integration of technological and economic analysis, and can make a substantial contribution to the identification of best-bet lines of technological development.

The PAM can also examine a wide range of possible responses to e.g. the increasing unprofitability of systems central to the livelihoods of poor people, including technological developments, public investment in infra-structure, and/or policy changes under varying degrees of degradation of existing systems. Three further points are demonstrated: first, that PAM is of potential interest to analysts of both agricultural research and agricultural policy, contributing to coherence between the two and to savings through the use of a joint database; second, that the New Institutional Economics can contribute by making estimates of the social prices of resources used and so contribute to PAM s capability to assess, for instance, the severity of recent adverse changes in more remote areas, and farmers own views on future options; third, the paper reviews how the PAM may be modified to incorporate environmental costs and benefits to produce an adjusted DRF , and so respond to criticisms that PAM has rarely considered the sustainability of commodity systems.

Finally, there is an alternative tradition in the economic and social analysis of commodity systems, the filiSre approach developed by French research institutions. Of particular relevance to PAM may be the filiSre emphasis on sub-systems and their comparative cost structures, and the variety of incentive indicators that are calculated.

Conclusions

Natural resources research managers are the clients for the outputs of the SEM research component. The presentations and subsequent discussions reflected the need for a balance of research between that done to push outwards the boundaries of socio-economics methodologies, and work to adapt existing methods to particular applications. Large-scale applications of work previously only done in pilot studies is an immediate need, as are methods to improve the quality and reliability of data generated by pilot projects as precursors to establishing whether wider applications are feasible. Other priorities that emerged for adaptation and wider testing were the application of needs assessment methods, stakeholder and gender analysis, improvements in the quality of data in FPR and the incorporation of local knowledge into NR research programmes.

Academic research in some areas including stakeholder and gender analysis, and local knowledge has

undoubt-edly increased our understanding of what ideally should be done and why; what is now urgently needed is guidance on what can be done and how under less than ideal conditions.

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