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'Economic Stakeholder Analysis' for Participatory Forest Management

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This paper presents the results of a research study on the use of economic methods for assessing stakeholder incentives in participatory forest management (PFM). The study's main objective is to provide appropriate and accessible methodological guidance for cost-effective economic analysis.

Main conclusions

- Participation by local forest users in forestry projects has often suffered from weak economic incentives. Poor understanding of these incentives has hampered project and policy design.
- Economic studies can be expensive and time consuming; and are often unnecessary. Where PFM is being considered as a new livelihood option, more qualitative economic analysis can often determine whether PFM is likely to be attractive compared to other livelihood options.
- The process of carrying out economic studies tends not to be very participatory. Participation is not easy, especially when people are less numerate and literate, but there are nevertheless various opportunities for encouraging participation and ownership, for example, by returning the data to local forest users in a form appropriate for community decision-making.
- PRA methods and traditional economic tools like household surveys are complementary rather than alternative tools for assessing stakeholder incentives. Sequencing of research methods is very important.
- PRA is valuable for understanding the decision-making context and for estimating labour and other costs of production, but unreliable for measuring household production and income.
- Valuation of subsistence production can be problematic, but various methods are available. Less tangible 'non-market' benefits like environmental services should be ranked by stakeholders with the quantified benefits to show their relative importance.
- For effective economic analysis of stakeholder incentives in PFM, there is no substitute for experience, imagination, and a firm grounding in economic theory.

Introduction

A major reason for the high failure rate of rural development forestry projects is the weak economic incentives for local forest users and other stakeholders to participate in sustainable forest management (SFM). In view of the high dependency of the rural poor on forests for their livelihoods, this has serious poverty implications. A key challenge for governments and donors is to design project interventions and policies which improve these incentives. However progress is constrained by poor understanding of decision-making criteria and incentives, especially the costs and benefits of alternative livelihood and land use options. Economics can provide more information on winners and losers, and help identify the interventions and policies needed to convert losers into winners.

But much economic guidance involves sophisticated methods beyond locally available budgets and skills, and rarely adopts the perspective of local forest users. There is relatively little guidance for using economics in more livelihood-oriented and multiple-purpose forestry situations. At the same time, there is increasing pressure to monitor and evaluate project impacts; economic studies can provide baseline data against which to measure livelihood, income and equity improvements.

In response to these gaps, the Forestry Research Programme of DFID funded ODI's Forest Policy and Environment Group to undertake a research study to develop an appropriate economics toolbox for PFM, and especially for the analysis of primary stakeholder incentives so crucial to successful poverty and environmental outcomes. The study included: a literature review on the application of economics in PFM situations (Davies and Richards, 1999); five 'economic stakeholder analysis' (ESA) case studies to develop and test economic tools in the context of PFM (Table 1); four regional training courses; and the publication of a toolbox-style manual in English (Richards et al, 2003) and Spanish (forthcoming).

This paper presents 'economic stakeholder analysis' (ESA) as a methodological framework for assessing PFM stakeholder incentives; assesses some of the challenges in the main ESA stages; and discusses some of the controversial issues surrounding the application of economics in PFM situations – particularly participation and the use of PRA[1] or RRA methods.

Economic stakeholder analysis (ESA)

ESA represents a systematic approach to assessing stakeholder incentives in PFM situations. Figure 1 presents the objectives of the six proposed ESA stages. The ESA framework should not be seen as a blueprint to be strictly followed, but rather as a checklist. As an iterative process it may be necessary to go back through the stages as new information is generated, for example, if ESA6 results in poor triangulation of the data. Not all ESA stages need implementing in every PFM or rural development forestry situation. Every situation is different – what to do and how to do it depends on the decision-making or problem context. For example, the objective in the Nepal case study was to increase transparency of benefit distribution in order to influence user group management systems and regulations in favour of poorer families; while in Ghana the challenge was to develop incentives for the retention of timber shade trees (as opposed to non-timber trees) by cocoa farmers.

When is an economic study necessary?

Given the expense, the first issue to consider is whether a more quantitative economic study is necessary. This depends on whether additional economic information is likely to help local people, donors or governments make key decisions, or better understand a key issue surrounding PFM (e.g. equity impacts). It is recommended that a more qualitative economic analysis be carried out first. This can involve:

- analysis of the policy, legal/tenure and institutional constraints to PFM – this may conclude that PFM is an unattractive option for local forest users;

Table 1. Summary of the ESA case studies

Case study	Objectives
NEPAL	To develop a participatory methodology for forest user groups to analyse the distribution of subsistence-oriented community forestry benefits, and for donors to assess the equity impacts of community forestry.
GHANA	To investigate current incentives for farmers to maintain timber trees (as opposed to non-timber shade trees) on their cocoa farms, and to design a system of incentives based on payments by concessionaires to farmers.
BOLIVIA	To develop a participatory methodology for colonist farmers to assess the economic returns from alternative land use options, including the management of small natural forest blocks.
MEXICO	To assess the economic returns from forest management and processing in forest 'ejidos', and to evaluate a range of participatory economic methods.
ZIMBABWE	To compare PRA and traditional economic research methods (a household survey) in the estimation of economic benefits from the cultivation and processing of *ilala* palm products.

- assessment of decision-making criteria in ESA2 (economic criteria may be less important than social or institutional criteria, for example)
- an analysis of resource endowments and constraints

The latter involves assessment of the resource or factor of production (mainly land, labour and capital) demands of PFM relative to the household's resource availability, and analysis of the opportunity cost implications of changes in resource use. For example, if family labour is fully occupied through the year in subsistence farming, and off-farm employment in the off-season, PFM is unlikely to be of much interest. This would also be the case if the PFM option demands considerable capital inputs (e.g. it requires a sawmill or mechanised harvesting equipment), credit is expensive, and forest users are risk averse.

Secondary data from other PFM initiatives, and 'back of the envelope' economic calculations can be very useful at this stage. For example, the stumpage value of timber or non-timber forest products is relatively easily estimated. Such a calculation can show that high transport costs for products from a forest distant from the market or port make it unlikely that SFM will be viable.

Physical quantification (ESA3)

Once the stakeholder groups and the decision-making context have been thoroughly researched (ESA stages 1 and 2), largely using PRA methods, the first quantitative stage (ESA3) is reached. Here the main challenge is reliable estimation of annual average forest production, and the production levels of livelihood alternatives. The ideal situation is where production or sales records exist, or where data exist to develop biological production models (as has been possible in the context of Joint Forest Management in India). If time and budget allow, a household recording system can be set up; researchers can measure or weigh production; or panel data can be collected based on multiple visits to households. In most situations however, there is little alternative to using memory recall methods.

Figure 1. Flowchart and objectives of ESA stages

ESA1 – The stakeholder groups
To identify and characterise the stakeholders, their objectives and their interactions with other stakeholders.

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ESA2 – The decisionmaking context or problem
To understand the decision-making context, identify livelihood options, prioritise decision-making criteria, and clarify the role of economic analysis.

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ESA3 – Physical quantification of benefits and costs
To identify and physically quantify the benefit (especially production levels) and cost flows.

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ESA4 – Valuation of benefits and costs
To value the benefits and costs with appropriate unit values.

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ESA5 – Economic comparison of livelihood alternatives
To make economic comparisons of the livelihood and land-use alternatives.

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ESA6 – Returning the data to the stakeholders
To return the data in an accessible form, triangulate it, and carry out participatory analysis and monitoring.

When considering memory-recall methods like PRA and surveys, practitioners should not view them as alternatives. It is rather a case of 'horses for courses'; for example, surveys are more reliable for variables like production and income levels with high variation between households; while PRA or key informant interviews are better for labour inputs and other costs where there is less inter-household variation. Due to the pros and cons of different memory recall methods, as well as real-life uncertainties, such as annual yield fluctuation from climatic and biological variation, it is essential to use at least two of them. A logical sequence is:

a) PRA to build understanding of the household economy, stakeholder objectives, livelihood choices, constraints, production systems, temporal and gender variation, as well as estimates of labour inputs and other costs;
b) Key informant discussions to triangulate the main costs, labour inputs, temporal variation, and for developing farm or household economic budgets;
c) A household survey of production, sales, consumption levels, off-farm employment, cash income, expenditure.

PRA exercises can also inform and improve the efficiency of subsequent key informant and household survey discussions. For example, they facilitate focused and short household surveys (since much data have already been collected), which in turn improves data quality.

Valuation of costs and benefits (ESA4)

Once a production estimate is obtained, a unit value or price is needed to estimate gross value or income, for both subsistence and marketed produce. Most effort in ESA4 should be spent on valuing the main products. This requires careful investigation of market prices over a number of years, so that a reasonable 'normal year' range is identified. For rarely traded forest products and subsistence values, the participatory 'barter-game' approach proved a useful and cost-effective method. This involves setting up a simulated barter exchange situation in which villagers barter commonly traded items (for example, sugar, maize, etc.) with forest products. However it was observed to cause some over-estimation of people's 'willingness to pay' for forest products.

Environmental values and other 'non-market' benefits from PFM can be important. Participatory methods like contingent ranking and ranking and scoring, have been used to derive numerical values. These methods are however theoretically and methodologically flawed, and the results should be treated with great caution. For major on-site 'indirect use' benefits, such as shelter-belt benefits for crops and reduced soil erosion, it may be possible to use more sophisticated economic methods like the 'change of productivity' method or nutrient replacement cost. But such methods are research and data intensive, and are not suitable when quick answers are needed.

For off-site impacts and more intangible benefits, unless advanced economics expertise and the corresponding budget are available, valuation is not advised – but a ranking exercise by stakeholders to show the relative importance of such benefits compared to quantified benefits is useful. There are limits to quantification, and it is unrealistic to attempt to value everything.

Insufficient attention is normally given to the costs of PFM, especially the transaction costs of local users from having to negotiate with outsiders (attending meetings, travel, complying with procedures, etc.). Other costs sometimes neglected include depreciation and maintenance of equipment, and the opportunity cost interest of capital.

Economic comparisons of the decision-making alternatives (ESA5)

It is sometimes possible to compare livelihood options based on the annual average flow of benefits and costs. In such cases, partial budgeting or gross margin analysis can be used. These calculations are easier to understand and the scope for participation is higher. However most situations involve the comparison of livelihood options with costs and benefits occurring at different points of time, requiring the use of discounting methods and cost-benefit analysis.

Given the importance of time as a cost in forestry, the ESA case studies made serious efforts to estimate local forest user discount rates, e.g. by getting villagers to express their 'time preference' for the present and future consumption of forestry-related items. This proved difficult, partly due to the hypothetical nature of the questions, and the results were difficult to interpret. It was concluded that it is normally best to use an opportunity cost discount rate (adjusted for inflation), and to carry out sensitivity analysis (checking the effect of varying the discount rate through a range).

Returning the data to the stakeholders (ESA6)

An essential final stage is to return the data in the most accessible form possible to the primary stakeholders for triangulation and analysis. Thus researchers need to constantly recall the importance of making the calculations relevant to community level decision-making. Field stakeholder workshops to discuss ESA study findings are important fora for secondary stakeholders, and can be an entry point for influencing policies.

How participatory can economic studies be?

A controversial issue surrounding economic analysis of PFM is that most economics studies have been carried out with minimal stakeholder participation. For economics to become more credible to PFM practitioners and the decision-makers themselves, more effort is needed to involve stakeholders, and to make the assumptions and results more transparent and accessible. Attempts to increase participation in the ESA case studies however revealed some important constraints to high levels of participation (Box 1).

To make data collection and analysis as participatory and cost-effective (especially to local people) as possible, the case studies adopted a pragmatic approach. This meant carrying out simpler calculations with the community, more complex calculations in the office, and returning the data in an accessible form to the community for triangulation and discussion. While the relatively short fieldwork periods in the case studies (generally four to five weeks) were not ideal for fostering higher levels of participation, the time constraints of local people were also a major constraint.

The limits to participation do not however diminish the importance of ownership and empowerment. When local users make economic calculations themselves they can be empowered in the decision-making process. This was the case in the Bolivia case study where the process enabled a frontier colonist group to improve its bargaining position with timber merchants. Thus every effort should be made to involve the main stakeholders at each ESA stage, and to help them understand the calculations. Establishing a participatory monitoring system (in ESA6) can also be a high priority since an economic analysis only offers a snapshot in time. The calculations and incentives change with commercial, biological, technological, policy or institutional changes.

The use of PRA methods

Some PFM practitioners see PRA as a more participatory, as well as quicker and cheaper, alternative to traditional economic methods like household surveys. However the case studies revealed a sharp trade-off between cost and reliability in data collection. The Zimbabwe case study in particular showed that PRA is unreliable for production and income data (Box 2). In the other case studies it was also observed that individuals in group situations are reluctant to reveal lower production levels than their neighbours. Therefore more participatory data collection methods were observed to result in exaggerated income estimates.

Researchers may favour PRA methods because they appear more cost-effective, but this is only because local people's time is not compensated. In the Zimbabwe study, community time spent on PRA was roughly five times that spent on the household survey. The higher real cost of a more participatory approach is however justified when it forms part of a PFM project design phase, and is essential for building ownership.

Box 1. Limits to participation

The ideal situation is where local forest users identify the need for an economic study, and then collect and analyse the data with outsider facilitation. Attempts were made in the case studies to involve local forest users in key ESA stages. However, a number of limitations were encountered:

- the objectives of the case studies were externally imposed, even though they generally responded to clear problems;
- the time constraints of busy local forest users (in spite of selecting 'slack' seasons for the studies);
- low levels of numeracy and literacy which make economic calculations very time-consuming for local people;
- participatory data collection methods tend to result in exaggerated production and income levels (see Box 2);
- methodological issues, especially surrounding valuation, which cannot be solved on the spot (e.g. valuation of rarely traded products and animal grazing benefits);
- calculations requiring computer processing, as when using discounting and cost-benefit analysis methods.

Who should the practitioners be?

An objective of the manual and training courses is to make the economic analysis of PFM more accessible to PFM practitioners, partly to encourage inter-disciplinary studies. In the training courses, there was a perception by some non-economists that economic analysis is a rather mechanistic exercise in which the tools can be learned and applied by anyone. It was however clear from the ESA case studies that appropriate application of economic tools, especially in the valuation and comparative economic analysis stages, requires experience, imagination and a firm grounding in economic theory. The need is for interdisciplinary studies which enable a more holistic understanding of stakeholder incentives.

Concluding comments

The ESA approach can encourage the systematic analysis of stakeholder incentives in PFM situations. The field research showed that while there is potential for using simpler and more participatory research methods, and making the calculations more relevant to local forest users, obtaining reliable economic data is neither cheap or easy. However, expensive economic studies often rely on sophisticated methods to disguise faulty data; much more attention is needed to improve the reliability of economic data – this is a major focus of the ESA approach. For example, sequencing and combining research methods, rather than reliance on a single method, is vital.

The manual's toolbox (Richards et al, 2003) is accessible to national economists without more advanced economics training, and should be intelligible to a wider non-economist readership – although it is not suggested that non-economists use the tools. The intention is rather to encourage interdisciplinary studies, and allow PFM practitioners to better understand the potential and limitations of economic studies, interpret the results, and question the assumptions used.

While economic analysis can provide more information and criteria for decision-makers, it does not result in decisions. Nor can it alter underlying market disincentives for SFM. It can however contribute to more enabling policies. In most countries there is a serious lack of reliable micro-economic information on PFM and SFM. This tends to result in underestimated forest values to the economy and to poor local users. ESA can help address this by indicating the value of forests for rural livelihoods, and bringing together policy-makers, local forest users and other stakeholders in field workshops to discuss the viability of PFM.

[1] The term 'PRA' is used here to refer mainly to a set of participatory research methods rather than to the broader participatory issues implied by such terms as participatory learning and action (PLA). Arguably we might have used the term rapid rural appraisal (RRA).

Box 2. Zimbabwe case study: comparing PRAs and surveys (Richards et al, 1999)

A direct comparison was made between PRA methods and a household survey for estimating the economic benefits from *ilala* palm (*Hyphaene petersiana*) cultivation and processing in southeast Zimbabwe. The two methods were compared by assessing the data sets of a range of economic variables. The results of this comparison can be summarised as follows:

Relative weaknesses of PRA studies:

PRA estimates of production and income were very high compared to reliable primary data from nearby areas, and in spite of facilitation by some of Zimbabwe's leading PRA practitioners. Possible reasons for the PRA over-estimation were:

- specialist and higher output craft producers tended to dominate group discussions;
- respondents perhaps wanted to show potential production levels in case a marketing project was 'in the offing';
- possible confusion between 'production' and 'sales';
- the PRA did not conform to best practice due to poor research planning and an unscheduled clash of meetings.

The bias problem of PRA was particularly evident from a comparison between two all-female PRA groups (one was a sub-group of the other). The two groups produced significantly divergent rankings of household cash income sources, including palm crafts. The larger PRA group was probably less reliable, since larger groups are less manageable.

Relative strengths of PRA:

- PRA methods were better for labour inputs: the PRA groups carefully deliberated the time required by each harvesting and processing stage,
- PRA better differentiated the complex range of craft products; there was a confusion between basket types in the survey;
- PRA was better for picking up temporal differentiation, such as the differences in *ilala* craft and wine production in good and bad agricultural years;
- survey respondents experienced a difficulty with the concept of 'hours'. While this was also problematic for the PRA groups, it was possible to reach a common understanding.

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