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Can PRA methods be used to collect economic data? A non-timber forest product case study from Zimbabwe

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• Introduction

In the past few years, Participatory Rural Appraisal (PRA) techniques have become ubiquitous and are almost an obligatory element in project design and implementation. But can they, as some PRA practitioners claim, generate quantitative economic data which is better (or at least comparable) and more cost-effective than that derived from 'traditional' neo-classical methods like household surveys? The Mabalauta Workshop[1] in south-east Zimbabwe tried to answer this question, among others. In the workshop, a direct comparison was made between PRA methods and a household sample survey for eliciting economic data on the use of the *Ilala* palm *(Hyphaene petersiana)*, an important non-timber forest product (NTFP) for livelihoods in this very arid area (mean annual rainfall of less than 450 mm.). This paper considers two main issues. First, can PRA produce similar economic data than traditional economic tools? Second, are PRA techniques really more 'cost-effective', especially when considering the time requirements of the participants?

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[1] The workshop was a collaborative effort between the Institute of Environmental Studies of the University of Zimbabwe, the UK Overseas Development Institute and the University of Alberta, Canada, bringing together economists, ecologists and sociologists from these and other institutions in a two-week 'research workshop' in September 1998.

• Methods

The two main approaches were compared by assessing the data sets for a range of variables, including the production and economic returns of the main palm products - a variety of baskets and other craft products, and palm wine.

PRA

On the first fieldwork day, a group composed of local researchers, government employees and community members identified the main uses of the palm. This led to five possible PRA stakeholder groups: craftswomen; craftsmen; male wine tappers; female wine tappers; and non-users. An invitation was made through community representatives to palm users to meet the following day. The response by the craftswomen in particular was very good since this was seen as a market opportunity (see Figure 1). However the much smaller number of wine tappers were busy with the palms, and it proved impractical to form PRA groups. The non-user PRA group was composed of people available at the time.

Next, with the large craftswomen group (varying from 30 to 50 participants over two days), a small craftsmen group (seven participants) and non-user groups, some conventional PRA exercises were carried out, including activity calendars and a pairwise ranking of livelihood or income sources, followed by estimates by each group of average labour requirements, household production (including annual variation), end uses, costs, prices, etc. In the case of the wine

Figure 1. Singing craftswomen hoping to sell their produce to the research team
[Photo: Michael Richards]

producers, the 'key informant' approach was used. Key informants were producers known to be knowledgeable about a particular product, or who just happened to be available at the time (this was important in the case of the wine tappers who were hard to locate).

Household survey

Sixty-nine households were selected using a systematic random sample survey approach (one per nine households), the sample being drawn from a food aid list of households from the same five Village Development Committee (VIDCO) areas as the PRA participants came from. An additional 16 wine-producing households were deliberately over-sampled to generate a reasonable data set which could be compared to the key informant data. Five enumerators from the area with some level of higher education were trained. The questionnaire was pre-tested and modified, and the enumerators were also monitored in the field.

• **Results**

Differences between the data sets

Table 1 compares the quantitative variables recorded by the two methodologies, including any noted advantages or disadvantages of the methods. While fairly similar results were obtained for some variables, there were some

major differences. The main area of discrepancy was in the production and sales of craft products. The PRA-based estimates were unrealistically high when household budgets based on the PRA data were compared to normal household incomes in the area. Possible reasons for this were:

• specialist producers of craft items were more dominant in the discussions;
• the strategic reason of wanting to show production potential, in case a marketing project was 'in the offing'[2]; and,
• possible confusion between production and unsold stocks. The survey produced income data much more in line with secondary data sources of incomes in rural Zimbabwe (Cavendish, 1997).

The scoring and ranking of income sources also revealed an inconsistency in PRA data. This exercise was carried out with the craftswomen on two successive days and was facilitated by the same female PRA facilitators. The only obvious difference between the days was in the size of the group which swelled from 33 on the first day to over 50 on the second. Most of the women who

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[2] Strategic bias is possible in a survey setting, but the fact that the PRA group was composed of palm producers, the tendency for expectations to rise when people talk in groups plus the visibility of foreigners in this case made the setting more conducive to strategic response.

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Table 1. Comparative summary of methodologies for measuring quantitative variables

Variable	General comment on differences and similarities	Advantages of PRA and disadvantages of survey	Advantages of survey and disadvantages of PRA
Stakeholder group as proportion of population	Similar results obtained from the two methods		Statistical representativeness
Ranking of cash income sources, and proportion of total household income from each source	Some similarities (e.g., livestock, hired labour) but PRA gave much greater share to palm products	PRA: better able to pick up minor or 'niche' sources of cash income, e.g. revenue from CAMPFIRE; PRA exercise carried out for good and bad years Survey: biased towards male cash income	Survey: Distribution of income could be assessed PRA: problem of averaging out PRA groups with wide livelihood diversity; contradictory ranking by 2 craftswomen PRA groups; PRA respondents less willing to reveal remittances from illegal employment in South Africa (less anonymity?); PRA might include potential income sources
Production levels of craft products (main determinant of economic returns)	Major differences: PRA production levels very high; survey data more realistic, possibly under-estimates	PRA: Clearer understanding of range of craft products (some confusion of basket types in survey) Survey: missed temporal variation; craftsperson in household often not interviewed	Survey: easier to identify specialist producers, who were given too much weight PRA: more prone to strategic response (hoping for a project)
Labour requirements	Higher labour inputs recorded by PRA; probable under-estimation by survey	PRA: different processing stages carefully considered, and consensus reached Survey: male respondents giving labour time of craftswomen, difficulty with 'hours', missed time in dye collection	
Sale prices	Prices recorded in PRA were generally higher	PRA: prices could be discussed, including seasonal/annual variation; mathematical derivation of prices in survey meant scope for error	PRA: Presence of foreigners might have resulted in inflated prices
End uses (% sold, consumed, barter, gifts, etc)	Similar results	PRA: differentiated between good and bad years (more sold in bad agricultural year)	

NB: Blank cells: No observation

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Table 2. Ranking of cash income sources by craftswomen

	PRA				Survey	
	Group 1		Group 2		Craftswomen	
Income source	Score	Rank	Score	Rank	Score	Rank
Petty business	11	1	6	5	1.3	9
Livestock sales	10	2	4	6	38.7	1
Crop sales	10	3	-	-	18.9	2
Beer brewing	10	4	3	7	2.6	6
Formal employment	8	5	2	8	7.7	4
Palm wine production	7	6	8	2	-	-
Palm craft sales	5	7	8	3	18.2	3
Thatching grass	5	8	1	11	1.9	8
Casual labour	5	9	1	9	0.2	11
Brick sales	4	10	9	1	1.3	9
Nut sales	2	11	1	10	-	-
Clay pot sales	1	12	8	4	-	-
Knitting, etc.	-	-	-	-	5.6	5
Other	-	-	-	-	2.6	6

attended the first day also came the second day. Table 2 compares the two PRA groups with the results of the household survey (using income recorded as the score)[3]. The results of the two PRA groups varied dramatically, despite the groups' similarity. The survey data was closer to the first PRA group, but there were still major differences, e.g. the importance of petty business. Also the ranking given to palm products, especially by PRA group 1, contradicted the production data revealed by these same groups.

For some quantitative aspects, however, the PRA exercise produced more reliable parameters, e.g., the labour requirements of the various craft products[4]. The craftswomen PRA group very carefully deliberated the time required, going through each harvesting and processing stage and reaching a consensus.

[3] It would have been interesting to conduct 2 household surveys to see if they produced similar results, yet it is more expected that 2 statistically correctly selected samples of the same population would do so. With PRA groups, the dynamic is often very different and it only takes the presence or absence of one dominant participant to make a difference in the 'consensus' response. This factor makes PRA quantitative data less reliable.

[4] This was because inter-craftsperson variation was much less for labour inputs. A PRA estimate is fine when everyone takes roughly the same time to make a basket, but not so good when people make very different numbers of baskets, so extreme values distort the group 'average'. Also see comments in Table 1.

The survey did not have this flexibility; and enumerators reported that respondents experienced considerable difficulty with the concept of 'hours'. While this was also problematic for the PRA groups, it was possible to reach a common understanding through more extended discussion. PRA methods proved more effective in terms of differentiating and understanding the complex range of baskets and other craft products, and were also better able to pick up temporal differentiation. There were important differences in craft and wine production in good and bad (drought) agricultural years; in difficult years people fall back more on *Ilala* palm products, so they act (as do many non-timber forest products) as a safety net.

Perhaps surprisingly, the household survey proved more revealing in terms of gender differences; for example, it was easier to assess and compare returns to male and female craft producers. But the survey was not without its problems. For example, there was some confusion over the different types of basket. Where the (normally female) craft producer was not the (normally male) survey respondent, under-estimation was more likely. It was felt that the use of key informants to complement the main methodologies was more reliable than either the PRA or survey data for obtaining detailed economic data. This was because of its flexibility and the greater possibilities of building up trust with the respondent. However the key informant

approach has to be combined with another research method, like a survey, in order to aggregate economic data for a larger area or population.

Difficulties in implementing research methods

Best practice proved most difficult to sustain in the PRA exercises; for example, the size of the study team and their diverse interests, combining research and training objectives, proved distracting; and the objectives and methodologies for the field work needed fuller discussion. But in a PRA exercise the methodological difficulties are more transparent than in a survey, since the analyst is more directly involved in data collection.

The household survey was not without its problems. There was little time to train the enumerators and pre-test the questionnaire, and an unreliable sample frame (some households were missing) may have resulted in biased estimates.

Cost-effectiveness

Time is one of the main factors in an analysis of 'cost-effectiveness'. Researcher and facilitator time for the survey was about 60 hours, including the time spent designing the forms, testing, enumerator training and monitoring enumerators (but excluding the enumerators themselves) - about one and a half times that involved in preparing and facilitating the PRA exercises. But this narrow view of cost-effectiveness ignores the cost to the 'beneficiaries'. It was estimated that community time spent in PRA exercises and community meetings was about 500 hours; about five times more than that spent on the household survey. Combining researcher/facilitator and community time reveals that the PRA absorbed approximately 240% more of everyone's time than the survey.

- **Discussion**

Strengths and weaknesses of research methods

The wider study (Mabalauta Working Group, forthcoming) confirms that PRA methods can provide good qualitative information, particularly on tenure and sociological aspects. The great strength of PRA tools is their ability to facilitate discussions, rather than being simply tools to collect data. But asking for detailed quantification in group situations can tax the patience of all concerned, and is subject to several forms of bias, especially that of more assertive individuals. Here it resulted in unrealistic production and income data. This experience indicates that PRA practitioners need to face up to the same issues of group randomness (or non-randomness), question design and consistency, and response bias which have long exercised users of household surveys. Other major weaknesses of PRA methods include the difficulty of investigating differentiation within PRA groups, and aggregating information (the results of different PRA groups cannot be added together).

The survey generated much more realistic production and income data. It is worth noting that the design of the survey benefited enormously from the understanding obtained from the PRA and key informant exercises; a possible conclusion of this is that good survey data is dependent on the previous application of other research methods. There are obvious statistical advantages of household surveys; for example, with a sufficient sample size they provide a means of evaluating the reliability of imperfect data from respondents. Household surveys are clearly superior for differentiating between households and the data can be aggregated, for example for a project area. The various disadvantages of surveys have been well documented (for example, by IIED, 1997) and include coping with intra-household differentiation, inflexibility, the scope for misunderstanding, lack of trust between the researcher and informant, gender bias, etc.

There are of course difficulties with any single-visit approach, whether using a survey or PRA methods. For example, PRA and survey participants' memories are imperfect and offer a selective viewpoint of local opinions and facts of the (even recent) past, and neither is reliable for generating accurate longer-term data. Both tools are susceptible to bias: enumerator and respondent bias in

surveys, representativeness of groups in PRA approaches. It is also suspected that the kinds of problems experienced in this research exercise are more common than researchers tend to admit, especially when it comes to publications. PRA methods are often used when time is limited. Here the Mabalauta Working Group was over-ambitious in trying to understand and quantify in a fortnight the range of biological, technical, economic and social relationships involving a multiple NTFP resource.

Where production technologies are reasonably uniform, and production time, type and cost of inputs are similar across producers, it can be argued that a few key informants can generate most of the information required more reliably than PRA groups or surveys. The use of key informants or focus groups is common to both household survey design and participatory approaches. Bishop and Scoones (1994) effectively used key informants to explore the economics of producing just one kind of palm-based basket. The main drawback of using key informants is their unrepresentativeness; other tools are necessary to obtain average household production levels for the area.

Complementarity of research methods: getting the right mix and sequence

The three methodologies discussed here all have their particular strengths and weaknesses, and could thus be combined to create a 'portfolio' of choices. Thus Ellis (1998) points out that *"for local and project purposes, a combination of participatory methods and small-scale sample surveys is likely to be the most cost-effective means of determining the livelihood strategies of rural households. The two methods serve different and complementary purposes."*

One research method can often be used to increase confidence in another; for example using a random sample survey to assess the degree of representation of key informants. Or if a survey were carried out first, researchers could look for key informants with typical characteristics. In this study, PRA and key informant data helped reduce the cost (by reducing the sample size) and improve the accuracy of a survey. A logical sequence

combining the three research methods discussed here might be:

- PRA and key informant discussions to gain a sound understanding of livelihood issues, and the underlying economic, social and ecological relationships.
- Role plays, wealth ranking and other PRA exercises to define and select stakeholder groups where appropriate.
- Primary stakeholder group PRA exercises to explore user group objectives, trade-offs and conflicts; to consider control and access to forest and other local resources; and to define the limiting (or scarce) factor or resource facing that group.
- Key informants to generate the main technical and economic parameters, complemented by, wherever possible, physical observation and time recording of key activities.
- A small but statistically representative household survey for establishing household income and production levels, as well as to collect more finely-tuned data on household characteristics, wealth status, and the degree of representation of stakeholder groups or key informants.
- Verification and modification of the data by comparing data from the three sources, and taking back the survey and key informant data for discussion with PRA stakeholder groups.

Whose cost-effectiveness counts?

From the researcher point of view, PRA is apparently very cost-effective because the research team had at its disposal several hundred hours more community members' time than, for example, a household survey. But PRA is 'cost-effective' only when no compensation is offered. Some form of remuneration previously negotiated with the community (e.g., a donation to the school, provision of medical services, etc.) might encourage increased participation and greater interest by the community, not to mention improved 'efficiency' of the research team if the 'costs' of participation are more apparent. Any discussion of cost-effectiveness is also dependent on the objectives: are the tools being used in a research context or to provide baseline data for a proposed project design, or for other community purposes? The higher

cost of a participatory approach can be justified if it leads to improved participation in the project cycle.

The trade-offs between the methods in terms of research objectives and cost are inherent in the need to balance the requirements of accuracy or quantification with the degree of participation. There is a continuum from more informal PRA tools and key informant discussions to more formal PRA tools (which can be quite inflexible and tedious for villagers) and sample surveys. Finally we argue that short-cut data collection methods like those discussed here are no substitute for longitudinal research methods (including multiple visits, household recording, participatory monitoring, physical measurement, anthropological observation, etc.) for more reliable analysis of economic incentives and project design purposes. But donors tend to consider short-cut data collection methods more 'cost-effective', especially in view of the normal time frame at the beginning of the project cycle. Such a view does not consider the high cost of poorly designed project interventions and weak participation by primary beneficiaries.

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Note: for more detail, see Davies J., Richards M. & Cavendish M. 1999. 'Beyond the Limits of PRA? A Comparison of Participatory and Conventional Economic Research Methods in the Analysis of Ilala Palm Use in South-Eastern Zimbabwe.' Overseas Development Institute, London (internet version, PDF-format, on ODI web-site http://www.oneworld.org/odi/fpeg/activities.html)

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