

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? As part of the 'Mabalauta Workshop' in south-eastern Zimbabwe, a 'head-to-head' comparison was made of 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) resource 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 (or better) economic data than traditional economic tools? Second, are PRA techniques really more 'cost-effective', especially when considering the time requirements of the 'beneficiaries'?

Methods

The comparability of the two main approaches was assessed by looking at 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. The PRA stakeholder groups were identified according to the main uses of *Ilala* palm and divided by gender. 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 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 Photo 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.

Thence, 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 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

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to locate).

In the case of the household survey, 69 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 selected and given a day's training. The questionnaire was pre-tested and modified, and the enumerators were also monitored in the field.

Results

Differences between the data sets

Table 1 presents a summary of the comparison of 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: (a) specialist producers of craft items (e.g., washing baskets) were more dominant in the discussions; (b) the strategic reason of wanting to show production potential, in case a marketing project was 'in the offing'; and (c) 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 a worrying inconsistency in PRA data. This exercise was carried out on two successive days with the craftswomen. The only obvious difference was in the size of the PRA group (the all-women PRA facilitators were the same); on the first day 33 women, were in the group, while on the second day the number swelled to over 50. Most of the women who attended the first day, also came the second day. Table 2 compares the two PRA groups and the results of the survey (using income recorded as the score). The results of the two PRA groups varied dramatically despite the similarity of the groups; the survey data was closer to the first PRA group, but there were still major differences, e.g., importance of petty business. Also the ranking given to palm products, especially by PRA group 1, was at variance with the production data revealed by these same groups.

Table 1. Comparative summary of methodologies for measuring quantitative variables

<i>Variable</i>	<i>General comment on differences and similarities</i>	<i>Advantages of PRA and disadvantages of survey</i>	<i>Advantages of survey and disadvantages of PRA</i>
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	Distribution of income could be assessed; 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 S 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	clearer understanding of range of craft products (some confusion of basket types in survey); survey missed temporal variation; craftsperson in household often not interviewed	easier to identify specialist producers, who were given too much weight in PRA; PRA more prone to strategic response (hoping for a project)
Labour requirements	higher labour inputs recorded by PRA; probable under-estimation by survey	different processing stages carefully considered, and consensus reached; problems of 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	Prices could be discussed, including seasonal/annual variation; mathematical derivation of prices in survey meant scope for error	Presence of foreigners in PRA 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)	

Table 2. Ranking of cash income sources by craftswomen

<i>Income source</i>	<i>PRA</i>				<i>Survey</i>	
	<i>Group 1</i>		<i>Group 2</i>		<i>Craftswomen</i>	
	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
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Casual labour	5	9	1	9	0.2	11
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Brick sales	4	10	9	1	1.3	9
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Nut sales	2	11	1	10	-	-
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Clay pot sales	1	12	8	4	-	-
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Knitting, etc.	-	-	-	-	5.6	5
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Other	-	-	-	-	2.6	6
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For some quantitative aspects, however, the PRA exercise produced more reliable parameters, e.g., the labour requirements of the various craft products. The craftswomen PRA group very carefully deliberated the time required, going through each harvesting and processing stage and reaching a consensus. The survey did not have this flexibility; also 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 was 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 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 in 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 third methodology used in this study to complement the main methodologies, the use of key informants, was more reliable than either the PRA or survey data for obtaining detailed economic data

Difficulties in implementing research methods

Best practice proved most difficult to sustain in the PRA exercises - the following problems were encountered in this study:

- X the unforeseen clash of meetings on both the first and second day of the research study (refuting the adage that lightning never strikes twice) affected the performance of the PRA groups as participants' interest levels and patience rapidly waned
- X the definition and selection of stakeholder groups was not ideal, mainly due to poor planning; wealth ranking is more problematic when people from several communities are invited to the same initial meeting and was not deemed feasible, while a PRA role play exercise might have been attempted with hindsight
- X there was insufficient discussion of the objectives and methodologies for the field work; the size of the study team and their diverse interests, combining research and training objectives, proved distracting

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. While training of enumerators and pre-testing of the questionnaire were carried out by an economist with previous experience of conducting household surveys in Zimbabwe, the time available for this was very short. Also an unreliable sample frame (some households were missing) may have resulted in biased estimates.

Cost-effectiveness

The main ingredient of the cost side of 'cost-effectiveness' is time. Researcher and facilitator time for the survey, about 60 hours including the time spent designing the forms, testing, enumerator training and monitoring of enumerators (but excluding the enumerators themselves) was very approximately about one and a half times that of 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 pre and post-PRA community meetings was about 500 hours, very roughly 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 in their ability to facilitate discussions, rather than being simply tools to collect data. The ensuing discussion can go beyond the numbers or scores to the finer detail behind the numbers (causes, key players, micro-politics, historical context, spatial context, access issues, etc.). 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. At the same time it should be pointed out 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 in a project area. The various disadvantages of surveys have been well documented (for example, by IIED, 1997) and include *inter alia* within household differentiation, inflexibility and 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. All short-cut research methods share a number of problems in the collection and interpretation of economic data. 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 reliable 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.

In a situation in which production technologies are reasonably uniform, so that the time taken for activities and the 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, but it is difficult to envisage a situation in which one methodological approach would be, or

would have to be, chosen to the exclusion of others. Particular tools, whether for research or development purposes, will always be available from 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."

Also, one research method can often be used to increase confidence in another; an obvious example of this would be to use a random sample survey to assess how representative key informants are. Or if a survey were carried out first, researchers could look for key informants with ‘modal’ characteristics. In this study, PRA and key informant data helped reduce the cost (sample size) and improve the accuracy of a survey. A logical sequence combining the three research methods discussed here for the assessment of stakeholder incentives in natural resource management situations might be:

1. PRA and key informant discussions to gain a sound understanding of livelihood issues, and the underlying economic, social and ecological relationships, as well as to inform the design of subsequent research tools;
2. Role plays, wealth ranking and other PRA exercises to define and select stakeholder groups where appropriate;
3. 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;
4. Key informants to generate the main technical and economic parameters, complemented by, wherever possible, physical observation and time recording of key activities;
5. 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 representativeness of stakeholder groups or key informants.
6. 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 (e.g., discussing key technical and economic parameters and any apparent anomalies).

Whose cost-effectiveness counts?

From the researcher point of view, PRA is apparently very cost-effective insofar as 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 *inter alia* 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.

Conclusion

The main conclusion is that the PRA approach failed to produce adequate quantitative economic data, and that the difficulties experienced by the Workshop practitioners may be more common than is often admitted: some of these difficulties appear intrinsic to the nature of PRA, such as the problem of bias caused by more assertive individuals. With regard to the financial analysis of Ilala palm use, the production and household income data generated by the survey and key informants were much more reliable than that produced by the PRA groups. But the PRA and key informant data on labour use, valuation (prices) and technological data were more trustworthy than that produced by the survey. It is therefore not a question of either/or but complementarity. Different research methods should be used both to collect different types of data and to triangulate or verify the data collected by another research method. The right sequence is also vital: here the PRA and key informant data informed the survey design. Finally, participatory research is arguably much more cost-effective for researchers not paying the opportunity costs of villager time, but much less cost-effective for the 'beneficiaries'.

References

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IIED. 1997. Valuing the Hidden Harvest: Methodological approaches for local-level economic analysis of wild resources. Sustainable Agriculture Programme Research Series Volume 3 No.4. Sustainable Agriculture Programme, International Institute for the Environment and Development, London

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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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